AAVBC

American Academy of Value Based Care

Anticoagulation Therapy Utilization Management

Quick Reference Guide

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AAVBC Anticoagulation Therapy Utilization Management - Quick Reference Guide

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1. LANDSCAPE AND UTILIZATION OF ANTICOAGULANTS IN VBC

Anticoagulants are life-saving, typically chronic medications that reduce the likelihood of recurrent venous thromboembolic events following **(un)provoked Venous Thromboembolisms (VTE)** or prophylactically for **atrial fibrillation (AF)** patients. **AF affects more than 6 million people in the United States** (prevalence exceeding 9%–10% among adults ≥80 years) and **900,000 people are affected by VTE** per year, which together account for **220,000-320,000 annual deaths**.[1] In 2023 alone, **over $25.1 billion** in Medicare Part D spending was exclusively on anticoagulant therapies (**second highest drug RISK STRATIFICATION class in Medicare Part D spending**).[2]

Value-based care in anticoagulant therapies seeks to provide patients with the most **efficacious** and **cost-effective** disease management tools. The AAVBC supports effective and efficient utilization of anticoagulants which **reduce avoidable hospital admissions**, and promote responsible **stewardship of therapy duration** to prevent stroke and recurrent VTE.

Thromboembolic Diseases are Managed Using a Diverse Palette of Drugs

Clinicians now navigate a broad and evolving therapeutic landscape for thromboembolic disease. **VTEs** are primarily managed with anticoagulants, including **direct oral anticoagulants (DOACs)**, **warfarin**, and titratable **low–molecular-weight heparin or intravenous, direct thrombin inhibitors.**[3,4] In contrast, **arterial thromboembolic events** are typically managed with **antiplatelet therapies**[5–7] (*Please refer to the AAVBC QRG: Antiplatelet Therapy Utilization*), with one notable exception being the anticoagulant **rivaroxaban** (Xarelto; 2.5 mg BID) for use in **Coronary Artery Disease (CAD)** and **Peripheral Artery Disease (PAD)** in combination with antiplatelet therapies.[6,7] In select acute, life-threatening presentations, **thrombolytic (fibrinolytic) agents** may be administered in monitored hospital settings to **actively dissolve established clots.**

Contemporary guidelines from the American College of Cardiology (ACC), American Heart Association (AHA), American College of Chest Physicians (CHEST), and other expert bodies emphasize that therapeutic selection of thromboembolic modulators **must be individualized based on:**[3,4,8,9]

- Confirmed clinical indication
- Presence of **mechanical heart valves**, moderate-to-severe **mitral stenosis,** or **WATCHMAN implants**
- **Stroke risk assessment** (**CHA_2DS_2-VASc Score** for AF patients)
- Bleeding risk assessment (**HAS-BLED score)**
- Age, bodyweight, and renal and hepatic function
- Patient-specific comorbidities and contraindications (e.g., **antiphospholipid syndrome**, drug allergies or intolerances, bleeding disorders)
- Drug-drug interactions
- Access to and appropriateness of anticoagulant/antiplatelet reversal agents

DOACs are generally preferred over warfarin for most patients with nonvalvular AF (**NVAF**) and for the treatment of many VTE cases.[3,4] At first glance, this may seem paradoxical, as **DOACs often cost more than 100 times the price of warfarin**.[10] However, DOACs are usually the appropriate option because of

their **improved safety profile**, **fewer drug–drug and dietary interactions**, and **lower risk of intracranial hemorrhage and gastrointestinal bleeding**.[4,8,11] However, important contraindications can prevent DOAC use. Appropriate anticoagulant drug selection, dosing, renal function monitoring, and periodic reassessment remain essential to ensure safe and effective therapy. **In VTE management**, **treatment duration** should reflect whether the event was provoked or unprovoked as well as the individual patient's bleeding risk.[3,4]

Value-Based Care in Anticoagulant Therapies is a Careful Balance

The central clinical imperative—and the primary value-based lever—is clear: **Prevent thromboembolic events while minimizing avoidable bleeding and fragmentation of care**.

AAVBC Tip: A key mechanism of achieving value-based care for anticoagulant therapies is through the use of **low-cost, generic anticoagulants whenever appropriate**. High-quality anticoagulation management enhances patient safety, preserves functional independence, and reduces avoidable utilization driven by preventable complications.

Prevalence and Clinical Context

Anticoagulation in older adults

Thromboembolic Risk	Bleeding Risk
AF patients are 5x more likely to suffer from ischemic strokes[12]	NVAF patients receiving DOACs and valvular AF patients receiving warfarin are at greater risk of GI bleeds
Unprovoked VTE patients may be in hypercoagulable states (potentially cancer-associated thrombosis)[3,9]	Cancer-associated thrombophilia requires chronic, long-term anticoagulation therapy which enhances bleeding risk
Hospitalized, immobile patients (post hip and knee surgery) are at higher provoked VTE risk due to venous stasis[3,9]	Anticoagulant prophylaxis leads to postoperative bleeding risk

Annual Cost Estimate Snapshot: Thromboembolic management for AF patients

Cost Category	Annual Cost Range (per person)	What it represents
Chronic oral anticoagulation: Generic dabigatran	$480 – $800/year[13,14]	Ongoing outpatient anticoagulant therapy: generic dabigatran 150 mg BID[15]
Chronic oral anticoagulation: FXa-targeted DOACs (class-level)	~$3,000 – $4,500/year	Ongoing outpatient anticoagulant therapy (e.g., apixaban (5 mg BID)/rivaroxaban (15-20 mg once daily, taken with food) class use in Medicare Part D)[16,17]
Chronic oral anticoagulation: warfarin (drug only)	~$50 – $300/year	Generic warfarin tablets (patient-specific dosages determined in clinic)[18]

Cost Category	Annual Cost Range (per person)	What it represents
Warfarin total management (excluding drug cost)	~$600 – $4,000/year	INR testing, clinician follow-up, anticoagulation management[14,19]
Potentially avoidable bleeding hospitalization (GI bleed)	~$32,000/admission[20]	Inpatient admission for severe GI bleeding

Opportunity For Safer, Smarter Care

A **single severe GI bleed hospitalization (~$32K)** can exceed the cost of **an entire year of DOAC therapy** for many Medicare patients[2,20]. This is not a reason to avoid anticoagulation when it is indicated. It highlights why **indication confirmation, appropriate anticoagulant selection, renal/weight-based dosing, interaction review, duration (re)assessment, and safer transitions of care** matter—because they protect patients and reduce avoidable utilization and bleeding-associated hospitalization.

2. INDICATIONS AND CONTRAINDICATIONS

Indications

This Quick Reference Guide applies primarily to **older adults (>65)** at **high venous thromboembolic risk** and/or are in **hypercoagulable states** receiving long-term (**outpatient**) anticoagulation therapies for one of the following primary indications:

A. Atrial Fibrillation (AF)

Stroke prevention in patients meeting guideline-supported risk thresholds.[8,21]
Typical therapies:

- DOACs (preferred in most **nonvalvular AF; NVAF**)
- Warfarin (mechanical valves, moderate-to-severe mitral stenosis)
- LMWH (temporary inpatient anticoagulation or peri-procedural bridging in select patients)

B. Prior Venous Thromboembolism (VTE/PE)

Including the acute treatment phase, extended secondary prevention, and/or post–pulmonary embolism.[3,4]
Typical therapies:

- DOACs (first-line therapy) • Warfarin • LMWH (malignancy, pregnancy, selected high-risk patients)

C. Special Populations

- Cancer-associated thrombosis (**unprovoked VTE**) • Advanced CDK • Mechanical heart valves
- **Antiphospholipid syndrome** • Factor V Leiden or Protein C/S Deficiency syndromes
- Critically ill, sedentary hospitalized patients • Post-orthopedic surgery

Within each indication group, therapy choice must reflect patient-specific contraindications and safety considerations

Contraindications

Absolute Contraindications: Anticoagulation Should Not Be Initiated

Category	Absolute Contraindication	Applies to	Clinical Rationale
Active bleeding	Active major bleeding (e.g. intracranial hemorrhage, ongoing GI hemorrhage)	All agents	Immediate risk outweighs thrombotic benefit
Recent (<1 month) high-risk CNS event	Acute intracranial hemorrhage	All agents	High risk of hematoma expansion
Severe thrombocytopenia	Platelet count <50,000/µL (context-dependent)	All agents	Inadequate hemostatic reserve
Severe hypersensitivity	Documented serious allergic reaction to specific agent	Agent-specific	Safety
Advanced hepatic failure with coagulopathy	Decompensated liver disease with elevated INR unrelated to therapy	Most agents	Impaired clotting factor synthesis
Pregnancy	DOACs and warfarin (especially first trimester)	DOACs, warfarin	Teratogenicity; LMWH preferred

Relative contraindications

Category	Clinical Situation	Considerations
Prior major bleeding	Remote GI bleed or intracranial hemorrhage	Assess timing, cause, modifiable risk factors; gastroprotection (PPIs)
Moderate thrombocytopenia	Platelets 50,000 - 100,000/µL	Individualized decision based on indication strength
Renal impairment	eGRFR <30 mL/min (DOAC-specific thresholds vary)	Dose adjustment for DOACs[15–17,22]; consider warfarin depending on severity
Advanced age/frailty	≥80 years; fall risk	Fall risk alone rarely outweighs stroke prevention benefit
Concomitant antiplatelet therapy	Dual pathway therapy) for Coronary Artery Disease or Peripheral Artery Disease[6,17,23]	Reassess necessity; minimize duration of combination therapy to lower bleeding risk
Drug–drug interactions	Strong CYP3A4 or P-gp inhibitors/inducers (**DOACs**)	Improve BP control before or during therapy
Uncontrolled hypertension	SBP >160 mm Hg	Impaired clotting factor synthesis
Active alcohol misuse	Heavy alcohol consumption	Increased bleeding risk and adherence concerns
Recent major surgery	High bleeding risk procedure	Timing of initiation/restart individualized

ANTICOAGULATION INITIATION: RISK STRATIFICATION DECISION FRAMEWORK

If outpatient anticoagulation is being considered for prevention or treatment of thromboembolic disease, several patient-specific factors must be evaluated to balance thromboembolic risk reduction with minimization of bleeding risk.

1. Confirm Indication and Thromboembolic Risk

Atrial Fibrillation (AF):

- Calculate **CHA_2DS_2-VASc score** (per 2023 AHA/ACC/HRS guideline[8])
  - ≥2 (men) or ≥3 (women) → anticoagulation recommended
  - 1 (men) or 2 (women) → consider anticoagulation

Venous Thromboembolism (VTE):

- Confirm indication (ASH 2020 guidelines)[3]:
  - Acute DVT/PE → anticoagulation indicated
  - Extended therapy → consider if unprovoked or persistent risk factors

2. Exclude Conditions Where DOACs Are Not Preferred

If **any present**, avoid DOACs → use **warfarin or LMWH**:

- Mechanical heart valve[13,4,83]
- Moderate–severe rheumatic mitral stenosis
- Antiphospholipid syndrome (especially triple-positive)
- Pregnancy or breastfeeding

3. Assess Renal Function

Calculate renal function by CrCl (Cockcroft–Gault; FDA labelling of DOACs based on clinical trial data).[15–17,22,24] **If**:

CrCl <15 mL/min or ESRD:

- Avoid most DOACs
- Consider **warfarin**
- Apixaban may be used in select AF patients (FDA labeling; limited trial data)[3,4,8]

4. Assess Bleeding Risk

- Calculate **HAS-BLED score** (ESC/EHRA guidance[10])

Interpretation:

- ≥3 → high bleeding risk

Guideline principle:

- Do **not withhold anticoagulation solely based on HAS-BLED**[8,11]
- Identify modifiable bleeding risk factors and increase monitoring

5. Special Clinical Scenarios (Use Caution)

Consider specialist input if:

- Catheter-associated DVT
- Splanchnic vein thrombosis
- Cerebral venous sinus thrombosis (CVST)
- Left ventricular thrombus

→ Evidence for DOACs is limited in these settings

6. Evaluate Drug-Drug Interactions

Assess for CYP3A4 and P-gp modulators (FDA labels, EHRA guidance[15–17,22,25,26])

Key considerations:

- Many CYP3A4 modulators also modulate P-gp[26]
- Apixaban/rivaroxaban → CYP3A4 + P-gp substrates
- Dabigatran/edoxaban → P-gp substrate

Examples:

- Moderate inhibitors: diltiazem, verapamil
- Strong inhibitors: azoles, ritonavir
- Inducers: rifampin, carbamazepine

Action:

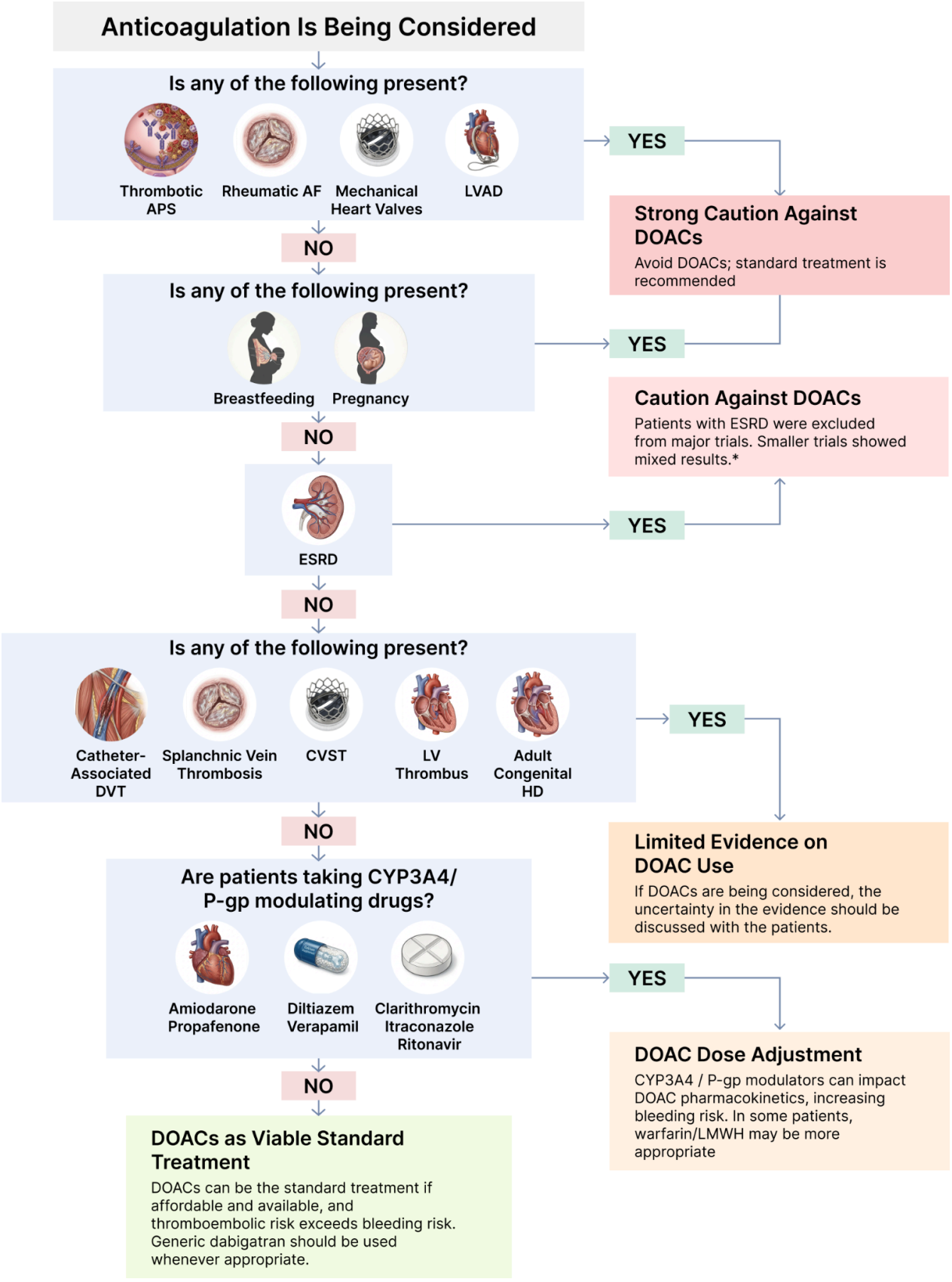
- Strong dual inhibitors/inducers → avoid DOACs
- Moderate inhibitors (e.g., diltiazem) → consider DOAC dose adjustment or alternative therapy[25]

7. Select Anticoagulant

If no contraindications:

- DOACs preferred over warfarin for:
  - NVAF
  - VTE treatment and primary/secondary prevention

Important Considerations for Direct Oral Anticoagulant Use



3. WARFARIN, DOACS, AND IV ANTICOAGULANTS: KEY CONSIDERATIONS

Anticoagulants reduce thrombotic risk by **interrupting the coagulation cascade** at critical steps. While warfarin, direct oral anticoagulants (DOACs), and heparin-based therapies all achieve anticoagulation, their **mechanisms**, **pharmacokinetics**, **monitoring needs**, and **clinical applications** differ substantially.

Warfarin (Vitamin K Antagonist)
Warfarin inhibits the vitamin K epoxide reductase complex (VKORC1), blocking recycling of vitamin K, depletion and thereby reducing synthesis of functional clotting factors II, VII, IX, and X, as well as regulatory proteins C and S. **Full anticoagulant effect requires several days** due to depletion of existing clotting factors. Routine monitoring with INR is necessary to safely maintain therapeutic range.

DOACs (Direct Oral Anticoagulants; dabigatran, apixaban, rivaroxaban, edoxaban)
DOACs achieve anticoagulation by **directly inhibiting active clotting factors** already in circulation (thrombin or Factor Xa), providing predictable effects and **rapid onset** (typically within hours). They do not interfere with clotting factor synthesis and generally do not require routine coagulation monitoring.[3,4,8]

Intravenous Direct Thrombin Inhibitors (Argatroban, Bivalirudin)
Argatroban and bivalirudin are parenteral direct thrombin inhibitors that bind directly to thrombin (Factor IIa), preventing conversion of fibrinogen to fibrin and inhibiting thrombin-mediated platelet activation. **Unlike heparins, their activity is independent of antithrombin**. These agents are **administered intravenously** with **rapid onset and short half-lives**, allowing precise titration in **acute care settings**. They are most commonly used when heparin is contraindicated, particularly in patients with **heparin-induced thrombocytopenia (HIT)**, and are monitored using activated partial thromboplastin time (aPTT) or other institutional protocols.[3,8,21]

Heparin-Based Anticoagulants (Unfractionated Heparin and Low–Molecular-Weight Heparin)
Heparin-based anticoagulants **enhance the activity of antithrombin**, leading to inhibition of key clotting factors within the coagulation cascade. Both **unfractionated heparin** (UFH) and low–molecular-weight heparin (LMWH) are commonly used in **hospitalized patients for short-term anticoagulation**, including initial treatment of **acute venous thromboembolism** and **bridging during transitions to or from warfarin therapy**. [3,8,21]

LMWH (enoxaparin, dalteparin) primarily inhibits Factor Xa and, to a lesser extent, thrombin. Its more predictable pharmacokinetics allow for fixed or weight-based dosing without routine laboratory monitoring in most patients. It is frequently used in inpatient and outpatient settings for treatment and prophylaxis of venous thromboembolism.

Unfractionated heparin (UFH) inhibits both thrombin (Factor IIa) and Factor Xa through antithrombin activation and is typically administered intravenously with dose titration based on activated partial thromboplastin time (aPTT) or anti-Xa monitoring. Due to its short half-life and nonrenal clearance, UFH is often preferred in patients with significant renal impairment or those who may require rapid adjustment or reversal of anticoagulation, such as during acute hospitalization or prior to invasive procedures.

While LMWH generally does not require routine monitoring, laboratory assessment (e.g., anti-Xa levels) may be considered in select populations, including patients with severe renal impairment, pregnancy, or extremes of body weight.

Comparison Table: Oral Anticoagulants

Feature	Warfarin	Direct Oral Anticoagulants (DOACs)
Mechanism	Inhibits vitamin K–dependent synthesis of factors II, VII, IX, X; indirect effect	Direct inhibition of activated clotting factors (Factor Xa or thrombin)
Onset of Action	Slow (days until full effect)[19,27]	Rapid (1–4 h)
Monitoring Needed	Yes — INR required	Generally no routine monitoring needed
Dietary Interactions	Significant (vitamin K intake affects effect; controlled dietary intake of **leafy greens**) Must **avoid drinking alcohol**, chamomile/green tea, cranberry/grape juice[18,27,28]	Minimal or none
Drug–Drug Interactions	Many, including antibiotics/antifungals[3]	Fewer overall; CYP3A4/P-gp modulators (ex. **Diltiazem**)[25]
Reversal Options	Vitamin K, PCC, FFP	Specific antidotes (e.g., idarucizumab for dabigatran; andexanet alfa for apixaban and rivaroxaban) and nonspecific antidotes 4-factor PCC
Practical Considerations	Requires frequent adjustments and monitoring	Fixed dosing with predictable pharmacokinetics
Preferred in	Mechanical valves, moderate–severe mitral stenosis, certain renal impairment; prophylactic use	Most NVAF and VTE

Comparison Table: Intravenous Anticoagulants (acute in-patient care)

Feature	Heparin (Unfractionated)	Intravenous thrombin inhibitors
Mechanism	Indirect anticoagulant that potentiates antithrombin, leading to inhibition of thrombin (Factor IIa) and Factor Xa	Directly inhibit thrombin (**argatroban** and **bivalirudin**), blocking conversion of fibrinogen to fibrin and thrombin-mediated platelet activation
Onset of Action	Rapid (minutes)	Rapid (minutes)
Monitoring Needed	Yes — typically monitored using activated partial thromboplastin time (aPTT) or anti-Xa levels	Yes — usually monitored with aPTT or institution-specific assays to guide infusion titration
Dietary Interactions	None	None
Drug–Drug Interactions	Few clinically significant interactions	Few clinically significant interactions

Feature	Heparin (Unfractionated)	Intravenous thrombin inhibitors
Reversal Options	Protamine sulfate partially or fully reverses anticoagulant effect	No specific reversal agent; effect dissipates relatively quickly due to short half-life
Practical Considerations	Continuous IV infusion with dose titration; risk of heparin-induced thrombocytopenia (HIT) requires platelet monitoring	Continuous IV infusion; short half-lives allow rapid titration; **do not cause HIT** and are commonly used when HIT is suspected or confirmed
Preferred in	Initial inpatient anticoagulation, procedural anticoagulation, situations requiring rapid reversibility	**Patients with heparin-induced thrombocytopenia (HIT)** or when heparin is contraindicated; certain interventional cardiology procedures (e.g., **PCI with bivalirudin**)

OAC Clinical Utilization Table

Agent (brand name; target)	Typical adult dosing (common indications)	Renal Considerations	Half-life (typical)	Total 2023 Medicare Part D claims (billions)	2023 CMS Part D average annual spending per beneficiary	GI bleeding signal (comparative)
Apixaban (Eliquis; Factor Xa)	**NVAF stroke prevention**: 5 mg PO BID; reduce to 2.5 mg PO BID if ≥2 of age ≥80, weight ≤60 kg, SCr ≥1.5 mg/dL[1] **DVT/PE treatment**: 10 mg PO BID x7 days, then 5 mg PO BID[1] **Extended VTE prevention**: 2.5 mg PO BID after ≥6 months[1]	Renal excretion ~27% of clearance[1] Dose-reduction criteria in NVAF are age/weight/SCr-based (not CrCl alone)[1]	~12 hours[16]	18.3B$	$4,652.28	Often lower GI bleed risk vs rivaroxaban (for NVAF patients) in comparative studies[29,30]
Rivaroxaban (Xarelto; Factor Xa) ***Generic available at 2.5 mg dose***	**NVAF stroke prevention**: 20 mg PO daily w evening meal; 15 mg daily w meal if CrCl 15–50 mL/min[5] **DVT/PE treatment**: 15 mg PO BID x21 days, then 20 mg PO daily w food[5] **Extended VTE prevention**: 10 mg PO daily (selected patients)[5]	Avoid if CrCl <15 mL/min; limited data CrCl 15–30 (closer monitoring advised)[6]	11–13 hours[17]	6.31B$	$4,674.70	Higher GI bleed rates vs apixaban (for NVAF patients) reported in cohort data[29,30]
Dabigatran* (Pradaxa;	**NVAF stroke prevention**: 150 mg	Anticoagulant activity and	12–17 hours[15]	0.54B$ (Pradaxa)	$1,216.81 (Pradaxa)	Evidence for lower GI

Agent (brand name; target)	Typical adult dosing (common indications)	Renal Considerations	Half-life (typical)	Total 2023 Medicare Part D claims (billions)	2023 CMS Part D average annual spending per beneficiary	GI bleeding signal (comparative)
thrombin) ***Generic available at all doses***	PO BID if CrCl >30; 75 mg PO BID if CrCl 15–30 **DVT/PE treatment**: 150 mg PO BID **after 5–10 days** parenteral anticoagulation (CrCl >30)	half-life increase with renal impairment Dosing guidance not provided for CrCl <15 mL/min		0.19B$ (generic)	$1,681.95 (generic)	bleeding risk vs rivaroxaban[30] (for NVAF patients)
Edoxaban (Savaysa; Factor Xa)	**NVAF stroke prevention**: 60 mg PO daily; reduce to 30 mg daily if CrCl 15–50 mL/min **VTE treatment**: 60 mg daily **after 5–10 days** parenteral anticoagulation; reduce to 30 mg if CrCl 15–50 mL/min or weight ≤60 kg	Renal clearance ~50% of total; dose reduction for CrCl 15–50 Not recommended CrCl <15	10–14 hours[22]	0.008B$	$3,319.24	GI bleed risk differs by dose; evidence varies by study design/population[31,32]

DOACs as a class have interactions with CYP3A4 and/or P-gp modulators[3,4,8]. Common CYP3A4 + P-gp modulators: itraconazole, clarithromycin, erythromycin, diltiazem, verapamil. **Common CYP3A4 modulators:** ketoconazole, rifampin, carbamazepine, phenytoin. **Common P-gp modulators:** doxorubicin, amiodarone, dronedarone, quinidine

4. ANTICOAGULANT DOSE ADJUSTMENTS & BLEEDING EVENTS

Anticoagulants have predictable pharmacokinetics and relatively short half-lives, such that in both perioperative settings and in patients presenting with acute bleeding, **time-based interruption ("time reversal") and drug clearance are the primary initial management strategies**.

For procedures with moderate or high bleeding risk, oral anticoagulants are typically withheld for approximately **≥5 half-lives prior to surgery**[3,4,8], with timing individualized based on the specific agent, renal function, and procedural bleeding risk. **DOACs have a more rapid onset and offset of action than warfarin** and therefore require shorter interruption periods. In general[3,4,8]:

- **Dabigatran** is withheld for ≥4 days (**or** 5-6 days if creatinine clearance <50 mL/min) before high bleeding risk procedures
- **Factor Xa inhibitors** (apixaban, rivaroxaban, edoxaban) are withheld for ≥3 days

Warfarin is typically held for ~5 days preoperatively.

Postoperatively, anticoagulation is generally **resumed once hemostasis is achieved**, often within **24–72 hours depending on bleeding risk**, with earlier resumption possible after low-risk procedures and delayed resumption after high-risk procedures.

In patients at **high thrombotic risk**, perioperative **bridging with parenteral heparin (e.g., LMWH or UFH)** may be considered during warfarin interruption once the INR falls below the therapeutic range. However, bridging should be used **selectively**, as routine bridging increases bleeding risk and is not recommended for most patients.

Immediate Assessment

When a patient on a DOAC presents with bleeding:

- Determine **time of last dose**
- Confirm **agent and dose**
- Assess **renal function (impaired renal function prolongs DOAC clearance, particularly for dabigatran)**
- Evaluate **hemodynamic stability**
- Identify **site and severity of bleeding**
- Review concomitant medications (antiplatelets, NSAIDs, CYP3A4 or P-gp inhibitors)

A. Activated Charcoal (Early Ingestion Only)

Activated charcoal may be considered to **limit systemic DOAC absorption when**[8]:

- Recent ingestion (generally within 2–4 hours)
- Known or suspected overdose
- Accidental double dosing
- Intentional ingestion with bleeding risk
- Significant bleeding with confirmed very recent dose

B. Minor Bleeding (mild epistaxis, superficial bruising, self–limited hematuria)

Management:

- Hold next dose temporarily
- Apply local hemostatic measures
- Reassess dose appropriateness
- Evaluate renal function
- Review interacting medications

Most minor bleeding resolves with supportive care and temporary interruption.

C. Clinically Relevant Non-Major Bleeding

Examples: persistent epistaxis, minor dental procedures, moderate GI bleeding without instability

Management:

- Hold DOAC
- Supportive care and local control

- Evaluate need for imaging or endoscopy
- Reassess indication and dosing before resumption

Restart only after the bleeding source is controlled and risk-benefit reassessed (**HAS-BLED score**).

D. Major or Life-Threatening Bleeding

Examples: intracranial hemorrhage, hemodynamic instability, large-volume GI bleeding. **Immediate actions**:

- Discontinue anticoagulant
- Stabilize airway, breathing, circulation
- Establish IV access
- Type and crossmatch if needed

Specific reversal options:

- **Dabigatran** → Idarucizumab
- **Factor Xa inhibitors (apixaban, rivaroxaban)** → Andexanet alfa
- **Warfarin** → Vitamin K
- If specific reversal unavailable → 4-factor PCC

Adjunctive measures:

- Surgical or procedural intervention as indicated
- Transfusion support
- Consider dialysis for dabigatran in severe renal impairment

E. Restarting Anticoagulation After Bleeding

Reinitiation depends on:

- Control of bleeding source
- Severity and site of bleed
- Ongoing thromboembolic risk
- Patient comorbidities
- Shared decision-making

For high thromboembolic risk conditions (e.g., **AF with elevated stroke risk**, **unprovoked VTE**), prolonged discontinuation **may increase stroke or recurrence risk.**[3,4,8] Restart timing should balance these competing risks in consultation with a primary care physician and integrate HAS-BLED score considerations.

5. ANTICOAGULANT UTILIZATION FRAMEWORK IN VBC

A common misconception in anticoagulation management is that **newer oral anticoagulants** should simply "**replace**" **older therapies** across most indications. In practice, DOACs (thrombin and Factor Xa inhibitors), warfarin, and heparin-based agents each maintain important roles depending on patient characteristics, clinical setting, and operational considerations. While generic options are available for all warfarin and heparin-based agents, **only dabigatran currently has a widely available generic DOAC option at clinically approved doses for NVAF and VTE**.

Despite this, **brand-name apixaban (Eliquis) accounts for a disproportionate share of Medicare Part D anticoagulant spending[10], approximately $18.3 billion of $25.1 billion in 2023 (~73%), whereas generic dabigatran represents a small fraction (~$256 million; ~1.0%)**. Although this prescribing pattern may partly reflect observational data suggesting that apixaban is associated with similar or, in some cohorts, lower bleeding risk than dabigatran, the **comparative evidence remains inconsistent** and is **not supported by head-to-head randomized trials**[14,31]. It may also reflect broader usability in select clinical settings (renal impairment), along with **prescribing inertia** and system-level influences such as **formulary design and marketing**.

From a **value-based care perspective**, the AAVBC supports anticoagulant selection that balances clinical efficacy, patient safety, and cost stewardship. As chronic therapies, anticoagulants must be **personalized to the individual patient**, accounting for clinical context, risk profile, and access considerations. Lower out-of-pocket costs can improve adherence, contributing to reduced, **preventable bleeding events and rehospitalizations.**

1) Clinical Efficacy and Guideline Alignment

- Prefer therapies with strong evidence for **preventing stroke and recurrent thromboembolism**
- Select agents supported by guideline-directed therapy for the specific indication and clinical setting
- Recognize that **warfarin remains first-line in select populations** (e.g., mechanical valves), while **heparin-based agents are essential in acute and perioperative care**

2) Safety and Personalization

- Individualize therapy based on **renal and hepatic function, age, weight, bleeding risk, and drug–drug interactions**
- Consider real-world factors affecting effectiveness, including adherence risk, swallowing ability & enteral access, affordability, dosing complexity, and renal function
- Account for settings where **short-acting, reversible agents (e.g., heparin) or monitorable therapies (e.g., warfarin) may be preferred**
- Use shared decision-making when multiple clinically appropriate options exist

3) Reversal Readiness at the Treating Facility

- Anticoagulant selection should consider whether **appropriate reversal strategies are available**
- Examples include:
  - **Idarucizumab** for dabigatran

  - **Andexanet alfa** for **apixaban** and **rivaroxaban**
  - Vitamin K and 4F-PCC for warfarin reversal
  - In settings without specific antidotes, **4F-PCC** may be used to support reversal, particularly in urgent scenarios
- Emergency, pharmacy, and perioperative teams should have **established protocols and rapid access to reversal agents**

4) Monitoring Compatibility

- DOACs generally do not require routine coagulation monitoring, but safe use requires:
  - **Renal and hepatic function assessment**[3,4,8]
  - **Perioperative interruption and restart protocols**
- Warfarin requires INR monitoring, may be advantageous in selected patients during transitions of care where close titration and verification of anticoagulant effect are needed, although this must be balanced against the challenges of coordinating follow-up and laboratory monitoring
- Heparin-based therapies allow rapid titration and monitoring (e.g., aPTT, anti-Xa) in acute settings
- Therapy selection should reflect the operational capabilities of the care setting

5) Value-Conscious Medication Selection

- When clinically appropriate, **lower-cost therapeutic equivalents should be prioritized**
- Lower out-of-pocket costs for patients increase adherence and downstream outcomes
- **Generic dabigatran remains the only widely available generic DOAC across NVAF and VTE indications**, while warfarin and heparins offer established low-cost options when DOACs are not appropriate
- **Selection should balance drug cost, monitoring burden, and complication risk**

6) Continuity Across Transitions of Care

- Therapy selection should support **safe transitions from hospital to outpatient care**
- Prior to discharge:
  - **Confirm insurance coverage and affordability**
  - Provide education on **adherence**, **bleeding precautions**, and **missed-dose management**
  - Arrange follow-up for monitoring (e.g., renal function, INR when applicable) and **medication reconciliation**

Summary Principle

AAVBC supports a "**right drug, right patient, right time**" approach to anticoagulation, prioritizing therapies that are guideline-aligned, personalized, reversible, operationally feasible, and economically sustainable. While DOACs are preferred in many settings, **clinicians should actively consider the lowest-cost therapeutic equivalents—particularly generic dabigatran**—when clinically appropriate, alongside warfarin and heparin-based agents, to improve adherence, reduce preventable complications, and optimize total cost of care.

6. ACTIONABLE ANTICOAGULANT COST-OPTIMIZATION STRATEGIES

For PCPs, ASCs, and Value-Based Care Organizations

1. Evidence-based Drug Selection

Choose the lowest-cost clinically appropriate anticoagulant based on indication, renal function, and patient adherence

Actions

- Use **generic dabigatran** when appropriate for NVAF and VTE
- Use warfarin for **artificial valve replacement AF** patients and **moderate-to-severe mitral stenosis**
- Avoid unnecessary **brand-only prescribing when alternatives exist**
- Use **unfractionated heparin instead of LMWH** in renal impairment when clinically appropriate
- Select **short-course therapy durations** consistent with guidelines

Cost Impact

- Potential patient savings: **$200–$600/month**
- Reduced payer spend across VBC contracts

2. Polypharmacy and Bleeding Risk Reduction

Prevent high-cost bleeding admissions, which are a major driver of **anticoagulation-related healthcare costs**.

Key High-Risk Combinations to Avoid

- Anticoagulants + NSAIDS
- Anticoagulants + dual antiplatelet therapy without clear indication
- Anticoagulants + strong CYP3A4 / P-gp inhibitors
- Warfarin + interacting medications (e.g., amiodarone without INR adjustment)

Actionable Steps

- Implement annual medication reconciliation
- Use EHR alerts for high-risk drug combinations
- Limit triple therapy duration (anticoagulant + dual antiplatelet therapy) after PCI

Cost Impact

- Avoidable GI bleeding admission cost: ~$32,000 per event[20]
- **Reduced hospitalization penalties or lost incentives in VBC programs (Star ratings)**

3. Renal-Function-Guided Anticoagulant Selection

Inappropriate dosing in renal impairment causes bleeding risk and costs.

Actionable Steps

- Check renal function at initiation and annually
- Prefer unfractionated heparin or warfarin in severe renal dysfunction
- Adjust DOAC dosing using CrCl-based algorithms
- Integrate EHR renal alerts

Cost Impact

- Reduced bleeding complications, **Lower readmission rates**

4. Formulary Standardization

Create Preferred anticoagulant pathways within health systems

Actionable Steps

- Establish tiered formulary options, **prioritizing generic dabigatran when appropriate**
- Use contracted DOACs negotiated with payers
- Implement pharmacist-led anticoagulation stewardship programs

Cost Impact

- Reduced drug spend across populations
- Improved prescribing consistency

5. Peri-Procedural Management Optimization

Improper anticoagulant interruption can cause costly complications

Actionable Steps (ASCs)

- Develop standard perioperative anticoagulation protocols
- Avoid unnecessary bridging therapy
- Use short-acting IV anticoagulants when rapid control is needed
- Coordinate pre-operative medication reconciliation

Cost Impact

- Reduced surgical delays & lower procedural complications

6. Anticoagulation Monitoring Programs

Structured management improves outcomes and reduces unnecessary care utilization

Actionable Steps

- Establish pharmacist-led anticoagulation clinics
- Implement INR monitoring pathways for warfarin
- Use digital adherence monitoring for DOAC patients
- Schedule annual anticoagulation reassessment visits

Cost Impact

- Fewer emergency visits & reduced stroke and bleeding events

7. Patient Cost Navigation

Medication affordability drives adherence

Actionable Steps

- **Prescribe generics when available for indication being written for**
- Screen patients for copay assistance programs
- Utilize manufacturer savings programs when generics available
- Provide transparent medication cost counseling

- Prescribe 90-day supplies when appropriate

Cost Impact
- Higher adherence & reduced stroke-related hospitalization

8. Population Health Analytics

Use data to identify high-risk anticoagulated patients

Actionable Steps
- Track: Bleeding admissions, stroke events, anticoagulant adherence
- Flag patients with: renal impairment, multiple interacting medicines, recent hospitalizations

Cost Impact
- Early intervention reduces downstream costs

7. TRANSITIONS OF CARE (HIGH-RISK WINDOW)

Hospital discharge following stroke, new AF diagnosis, VTE, or other thromboembolic conditions represents **a well-established high-risk period for anticoagulant-related harm, including both bleeding and recurrent thrombosis**. Contemporary guidance from the ACC, AHA, CHEST, and ASH emphasizes that safe transitions of care require structured reassessment of indication, agent selection, dosing, drug interactions, renal function, and follow-up planning.[3,4,8,11]

For AF, anticoagulation decisions should be guided by **validated stroke risk assessment** (CHA_2DS_2-VASc) and balanced against **bleeding risk** (HAS-BLED), with additional considerations for valvular status and device-based interventions (e.g., WATCHMAN).[8,11] For VTE, treatment phase, provoking factors, and bleeding risk should guide duration and reassessment.[3] Across all indications, outpatient continuity and medication reconciliation are critical to preserving therapeutic benefit while minimizing avoidable harm, particularly in older adults with polypharmacy.

Discharge Anticoagulation Safety Checklist

Complete at every care transition and document in EHR

▼

1	**Confirm Indication & Risk Stratification** A) **NVAF**[8] • CHA_2DS_2-VASc ≥2 (men) or ≥3 (women) → anticoagulation recommended • Consider anticoagulation at score 1 (men) or 2 (women) based on shared decision-making • HAS-BLED ≥3 → high bleeding risk (requires closer monitoring, not exclusion) B) **AF with mechanical valve**[8] • Warfarin required; DOACs contraindicated • INR targets: 2.0-3.0 (most valves); 2.5-3.5 (mitral/high-risk valves)

C) **WATCHMAN/LAAO**
- Typical post-implant regimen[21]: i)0-45 days warfarin + 81 mg daily aspirin; ii) 45 days - 6 months DAPT (325 mg aspirin + 75 mg clopidogrel daily) iii) >6 months lifelong 325 mg daily aspirin

D) **VTE (DVT/PE)**
- Minimum treatment duration: 3 months[9]
- Extended therapy based on risk-benefit assessment (for unprovoked VTE or provoked by persistent risk factor, extended-phase anticoagulation recommended)

Document in EHR

▼

2

Verify Correct Agent for Renal Function

Calculate CrCl using Cockroft-Gault prior to discharge

DOACs - NVAF
- Dabigatran
  - CrCl ≥30 mL/min: 150 mg BID
  - CrCl 15–30 mL/min: **75 mg BID (dose reduction)**
  - CrCl <15 mL/min or dialysis: **Avoid**
- Apixaban
  - Standard: 5 mg BID
  - Reduce to **2.5 mg BID if ≥2 of the following**:
    - Age ≥80 years or Weight ≤60 kg or Serum creatinine ≥1.5 mg/dL
  - CrCl <15 mL/min: **Limited data; generally avoid or use with caution depending on clinical context**
- Rivaroxaban
  - CrCl >50 mL/min: 20 mg once daily (with food)
  - CrCl 15–50 mL/min: **15 mg once daily (dose reduction)**
  - CrCl <15 mL/min: **Avoid**
- Edoxaban
  - CrCl 50–95 mL/min: 60 mg once daily
  - CrCl 15–50 mL/min: **30 mg once daily (dose reduction)**
  - CrCl <15 mL/min: **Avoid**
  - CrCl >95 mL/min: **Avoid (reduced efficacy/increased stroke risk)**

Dose-adjust or select alternatives (**warfarin**, **LMWH**) **if renal impairment identified or other contraindications (e.g. mechanical valve)**

▼

3A

Polypharmacy & Interaction Safety: DOACs

Review and document:
- Antiplatelets (aspirin, P2Y12 inhibitors); Avoid routine combination unless clear indication (e.g., recent PCI, WATCHMAN implant)
- NSAIDs → discontinue if possible (increased bleeding risk)
- CYP3A4 / P-gp modulators:
  Inhibitors (↑ DOAC levels): azoles, macrolides, amiodarone, verapamil[26]
  Inducers (↓ DOAC levels): rifampin, carbamazepine, phenytoin[26]

Rhythm control agents (often prescribed with AF)[25]:
- Amiodarone, dronedarone, verapamil → ↑ DOAC exposure (dose adjustments required)

De-escalate unnecessary combination therapy

▼

3B

Polypharmacy & Interaction Safety: Warfarin

Target INR (check within 3-5 days post-discharge)[8,18]:

- 2.0-3.0 (most indications)
- 2.5-3.5 (mechanical valves)

Review and document:

- Antiplatelets (aspirin, P2Y12 inhibitors); Avoid routine combination unless clear indication (e.g., recent PCI, WATCHMAN implant)[21]
- NSAIDs → discontinue if possible (increased bleeding risk)
- CYP2C9, 1A2, and 3A4 modulators (many antibiotics and antifungals)
- Potential dietary interactions (alcohol, leafy vegetables, green tea, liver meats)

Close INR monitoring required throughout any medication changes

▼

4

Bleeding Risk Mitigation

Calculate HAS-BLED score. **If ≥3, address modifiable risks** to lower anticoagulant-associated bleeding risk:

- Uncontrolled hypertension
- NSAIDs/alcohol
- Labile INR

High score → monitoring trigger, not absolute contraindication

▼

5

Anticoagulant Agent Reversal Planning

- Dabigatran → Idarucizumab
- Factor Xa inhibitors → Andexanet alfa
- Warfarin → 4-factor PCC ± vitamin K

Confirm access to and awareness of reversal options

▼

6

Medication Reconciliation & Patient Education

Reconcile full medication list at discharge, then confirm patient/caregiver understands:

Purpose of therapy

- Prevents stroke, blood clots, or recurrence of DVT/PE

How to take the medication

- Take exactly as prescribed
- Do not double doses if one is missed

Missed dose instructions

- Take as soon as remembered (same day)
- Skip if close to next dose (do not double)

Bleeding warning signs

- Unusual bruising, prolonged bleeding
- Blood in urine or stool, black/tarry stools
- Severe headache or dizziness

When to seek urgent care

- Fall with head injury
- Uncontrolled bleeding
- Signs of stroke (weakness, speech changes)

Medication safety

- Avoid NSAIDs unless directed
- Check before starting new medications or supplements

Warfarin-specific dietary interactions and INR monitoring planning

- Maintain consistent dietary vitamin K intake
- Attend all INR checks

Provide written anticoagulation plan and emergency contact information
Confirm understanding using teach-back method

▼

7

Follow-Up Timing

High-risk patients (≥80 yrs, CrCl <30, recent bleed, polypharmacy ≥5 meds):
→ Follow-up within ≤7 days (lower 30 day readmission rate)
AF patients:

- Reassessment within **1–4 weeks**
  - **WATCHMAN patients:**
    - Follow-up imaging at ~45 days[21]

VTE patients:

- Early follow-up **1-4 weeks**
- Reassess at **3 months** for duration decision

Appointments scheduled prior to discharge

▼

✔ **ALL CLEAR**

Document checklist completion in the EHR

8. ONGOING STEWARDSHIP & REASSESSMENT

Anticoagulant therapy should be reassessed **at least annually**, and **more often when clinical status changes**, to confirm that the expected **reduction in thromboembolic risk** continues to **outweigh bleeding risk**. Stewardship review should include not only the ongoing indication for therapy, but also changes in renal function, bleeding history, fall risk, adherence, and the patient's full medication profile, with **recalculation of CHA_2DS_2-VASc** in AF patients when relevant.

A focused medication review should specifically evaluate concomitant **antiplatelets** and **NSAIDs**, both of which can increase bleeding risk when combined with oral anticoagulants. Intense combination therapy may occasionally be necessary, such as after acute coronary syndrome or coronary stenting, but the **regimen and duration should be revisited regularly to reduce avoidable bleeding admissions related to polypharmacy.**

Review should also identify clinically important pharmacokinetic interactions. **Amiodarone** can potentiate warfarin and increase INR, often requiring closer INR follow-up and dose adjustment. For DOACs, **strong CYP3A4 and/or P-gp modulators (inhibitors or activators)** can raise anticoagulant exposure and bleeding risk, particularly with apixaban and rivaroxaban, and this risk may be amplified in renal impairment. An important DOAC drug-drug interaction for NVAF is with **diltiazem**, an antiarrhythmic medication that acts as a moderate CYP3A4 and P-gp inhibitor. Concomitant use of diltiazem with apixaban or rivaroxaban can increase plasma concentrations of these anticoagulants, thereby elevating bleeding risk. Although this interaction is generally less pronounced than with strong inhibitors, it remains clinically relevant, especially in older adults or those with reduced renal function. Careful assessment of bleeding risk, consideration of

dose adjustment where appropriate, and ongoing clinical monitoring are recommended when these agents are used together.

For patients receiving **warfarin**, stewardship should also address **diet consistency**, especially vitamin K intake. Patients do not need to avoid vitamin K-containing foods entirely, but major week-to-week variation can alter INR control and should prompt counseling and reassessment. Furthermore, patients must avoid drinking alcohol, cranberry/grape juice, and chamomile/green teas.[28]

Utilization Goal:
Reduce preventable bleeding admissions related to polypharmacy and inappropriate antithrombotic combinations.

Annual Review Should Include:

- Confirmation of ongoing indication
- Renal function update
- Fall risk evaluation
- Bleeding history review
- Adherence discussion
- Recalculation of CHA_2DS_2-VASc (if AF)
- Review of concomitant antiplatelets and NSAIDs
- Review for amiodarone and other major drug interactions
- Assessment for strong CYP3A4/P-gp inhibitors with DOACs
- Dietary consistency counseling for patients taking warfarin

9. PATIENT-CENTERED CONVERSATION FRAMEWORK

Because anticoagulants directly balance **thromboembolic prevention against bleeding risk**, **effective communication is essential** to ensure patients understand both the **benefits** and **responsibilities** associated with therapy. A consistent conversation framework helps clinicians support informed decision-making while improving adherence, safety, and long-term outcomes.

Core Elements of the Conversation Framework

1. Clarify the Clinical Purpose

Begin by explaining **why anticoagulation is recommended** in the patient's specific case.

Key points to address

- The condition being treated or prevented (e.g., **atrial fibrillation-associated stroke prevention**, **treatment of DVT/PE**)
- The patient's individual **risk of clotting without therapy**
- Expected benefits of anticoagulation

Example explanation
"Because atrial fibrillation increases the risk of stroke, anticoagulant therapy significantly reduces that risk by preventing clot formation."

2. Discuss Therapy Options

Present the **appropriate anticoagulant choices** in a clear, comparative way. Topics to review:

- Oral anticoagulants (DOACs, warfarin) vs LMWH/heparin
- Dosing schedules and administration
- Monitoring requirements
- Reversal options and safety considerations

Patients should understand that **different therapies may be recommended based on medical conditions, kidney function, surgical plans, or other medications.**

3. Explain Risk–Benefit Balance

Anticoagulant discussions must explicitly address **bleeding risk alongside thromboembolic prevention**. **Key discussion points**:

- Expected reduction in stroke or clot risk
- Possible bleeding complications
- Situations that require urgent medical attention

Patients should understand that **the goal of therapy is risk reduction, not complete elimination of risk.**

4. Assess Patient-Specific Factors

Clinicians should explore practical factors that affect treatment success. **Important considerations**:

- Medication affordability and insurance coverage
- Ability to maintain daily dosing adherence
- Access to laboratory monitoring (if using warfarin)
- Upcoming procedures or surgeries
- Other medications that may interact with anticoagulants

Addressing these issues early helps **prevent treatment interruptions or complications.**

5. Confirm Institutional Safety Resources

Patients should be reassured that **emergency management strategies exist if complications occur. Examples:**

- Availability of reversal agents when appropriate
- Emergency care protocols for bleeding events
- Hospital or clinic monitoring pathways

This discussion often improves **patient confidence and willingness to start therapy.**

6. Provide Clear Patient Education

Patients should leave the visit understanding **how to safely manage their anticoagulant therapy**.
Topics:

- What to do if a dose is missed
- Signs of bleeding to watch for
- When to contact a clinician
- Medication interactions (including OTC drugs and supplements)

Written instructions and follow-up contact information should be provided whenever possible.

10. HCC AND QUALITY ALIGNMENT[33]

Condition/Indication	Common Anticoagulant Therapies	ICD-10 Examples	CMS-HCC V28	Approximate RAF Contribution
Atrial fibrillation atrial flutter	DOACs, warfarin	I48.0, I48.1, I48.2, I48.91	HCC 238 – Specified Heart Arrhythmias	0.299
Venous thromboembolism (DVT)	DOACs, warfarin, LMWH/heparin	I82.4xx, I82.5xx	HCC 267 – Venous Thromboembolism	0.294
Pulmonary embolism	DOACs, warfarin, LMWH/heparin	I26.xx	HCC 267 – Venous Thromboembolism	0.294
Chronic pulmonary embolism	DOACs, warfarin	I27.82	HCC 267 – Venous Thromboembolism	0.294
Hypercoagulable states/thrombophilia	DOACs, warfarin, LMWH	D68.5x, D68.6x	HCC 112 – Coagulation Defects and Other Specified Hematological Disorders	0.45
Antiphospholipid syndrome	Warfarin, LMWH	D68.61	HCC 112 – Coagulation Disorders	0.45
Mechanical heart valve	Warfarin	Z95.2	Non-HCC (status code but clinically relevant)	0
Cancer-associated thrombosis	LMWH, DOACs	Cxx.xx + I82.xx	Multiple cancer HCCs (e.g., HCC 17–23 depending on malignancy)	0.186–4.209
End-stage renal disease (anticoagulant selection considerations)	Warfarin, LMWH (often preferred over DOACs)	N18.6	HCC 326 – ESRD	0.815
Post-orthopedic surgery VTE prophylaxis	LMWH, DOACs, heparin	Z96.xx + Z47.xx	Typically non-HCC but risk relevant	0

11. KEY QUALITY MEASURES FOR ANTICOAGULANTS (HEDIS/STARS/PQA)

Anticoagulant care quality is measured through **Healthcare Effectiveness Data and Information Set (HEDIS) and CMS Star Ratings indicators** focused on safety, monitoring, and appropriate use. Key HEDIS and PQA measures are summarized below.

Anticoagulant Clinical Metrics Compliant with HEDIS/STARs/PQA

Measure Name	Type	Description
International Normalized Ratio Monitoring for Individuals on Warfarin (INR)	HEDIS (PQA)	Evaluates the percentage of members 18 years of age and older who had at least one INR monitoring test during the measurement year while on warfarin
Use of High-Risk Medications in the Elderly (DAE/HRM)	HEDIS (STARs)	Assesses if patients 65+ are taking anticoagulants that are deemed high-risk (e.g., in certain scenarios), focusing on appropriate prescribing to minimize bleeding risk
Medication Reconciliation Post-Discharge (MRP)	HEDIS	Evaluates if a medication reconciliation was completed for patients, including those on anticoagulants, after a discharge from an acute or non-acute inpatient facility
Statin Therapy for Patients With Cardiovascular Disease (SPC)	HEDIS	Assesses if patients with cardiovascular disease (a common reason for anticoagulation) are on appropriate lipid-lowering therapy

Star Ratings for Clinical Presentations Relevant to Anticoagulant Therapies

Category	Star Measure [IDs]	Star Rating Tie-in/Weight	Key Compliance Requirement
Stroke Prevention	AHA/GWTG Stroke/ [**D12**]Statin Therapy (SUPD)	**3x (Triple)** weight for Medication Adherence	Use of anticoagulants for AF and statins for cardiovascular disease
Reduced Readmissions	[**C18**] Plan All-Cause Readmissions (PCR)	**3x (Triple)** weight (for MY 2023+)	Percentage of acute stays followed by an unplanned readmission within 30 days
Safe Medication Management for Metabolic Diseases	Medication Adherence ([**D09**] RAS, [**D10**] Statins, [**D8**] Diabetes)	**3x (Triple)** weight each	Ensuring patients remain on chronic medications for at least 80% of the measurement period
Med Rec (Medication Reconciliation)	[**C17**] Medication Reconciliation Post-Discharge	**1x** (Part of TRC composite)	Medications reconciled by a prescribing practitioner, RN, or pharmacist within 30 days of discharge
TRC (Transitions of Care)	[**C21**] Follow-up after ED - Multiple High Risk Chronic Conditions	**1x** (TRC is a 4-part composite)	Documentation of admission notification, discharge info, patient engagement, and med rec

12. TOP 10 KEY TAKEAWAYS: ANTICOAGULATION IN VBC

1. Anticoagulation is a Major VBC Priority In Older Adults

AF and VTE are common, high-cost, high-risk conditions in Medicare populations, and anticoagulants are central to preventing stroke, recurrent VTE, and avoidable disability

2. The Core VBC Goal is Dual: Prevent Clots While Minimizing Bleeding

High-value anticoagulation management is not just about prescribing therapy, but about balancing thromboembolic prevention against preventable major bleeding and hospitalization

3. DOACs are Preferred for Most NVAF Patients but Not for Everyone

DOACs generally offer simpler use and favorable safety profiles, but warfarin remains preferred for mechanical valves, moderate-to-severe mitral stenosis, and some patients with severe renal dysfunction

4. Correct Drug Selection And Dosing Are Major Cost And Quality Levers

Inappropriate initiation, **not choosing a generic option when appropriate**, incorrect dose reduction, failure to adjust for renal function, and therapy continuation beyond the recommended duration all drive avoidable harm and excess utilization

5. Bleeding Admissions Are Often More Expensive Than The Drug Itself

A severe GI bleed admission can exceed the annual cost of outpatient anticoagulation[20], making stewardship, interaction review, and reassessment financially and clinically essential

6. Renal Function Must Be Treated As A Dynamic Risk Factor

Kidney function directly affects anticoagulant choice, dosing, and safety. UFH and warfarin may be more appropriate in advanced renal impairment, while DOAC dosing requires ongoing reassessment

7. Transitions Of Care Are A Predictable High-Risk Window

Discharge after AF diagnosis, stroke, GI bleed, or VTE is a vulnerable period for medication errors, poor follow-up, and readmissions. Safe handoffs, medication reconciliation, and early follow-up are critical VBC interventions

8. Polypharmacy Is A Major Driver Of Preventable Bleeding

Concomitant antiplatelets, NSAIDs, amiodarone, and strong CYP3A4/P-gp inhibitors can materially increase bleeding risk or alter anticoagulant exposure, making medication review a high-yield stewardship activity

9. Anticoagulation Stewardship Should Be Continuous, Not One-Time

Annual and event-triggered reassessment should confirm indication, renal function, bleeding history, fall risk, adherence, CHA_2DS_2-VASc status in AF, and warfarin diet consistency. Discontinuation of long-term anticoagulation may be appropriate in selected clinical scenarios, such as after successful left atrial appendage occlusion (WATCHMAN implant) following completion of the recommended short-term post-procedural antithrombotic regimen[21], or after cardioversion or catheter ablation in patients with low

stroke risk and no other indications for long-term anticoagulation. Decisions to stop long-term therapy should be individualized and guided by current guideline recommendations and patient-specific risk profiles.

10. VBC Organizations Can Improve Outcomes And Lower Costs Through Standardization

Preferred pathways, formulary management, pharmacist-led monitoring, peri-procedural protocols, adherence support, and patient cost navigation can reduce avoidable complications and improve total cost of care

AAVBC SUMMARY AND CONCLUSION

Anticoagulant therapy is a foundational component of stroke and venous thromboembolism prevention in older adults and other high-risk populations. Within value-based care, **its importance extends beyond clinical efficacy alone**. Anticoagulants sit at the intersection of **patient safety**, **avoidable utilization**, **medication affordability**, and **care coordination**. When used appropriately, they prevent catastrophic thromboembolic events, preserve functional independence, and reduce downstream costs associated with stroke, recurrent VTE, hospitalization, and long-term disability.

At the same time, anticoagulants are among the most clinically complex and operationally sensitive medications in routine practice. Appropriate therapy selection requires **careful attention to indication**, **renal and hepatic function**, **age**, **body weight**, **bleeding risk**, **interacting medications**, **reversibility**, and **site-of-care capabilities**. DOACs are generally preferred for many patients with NVAF and VTE, while warfarin, unfractionated heparin, LMWH, and intravenous direct thrombin inhibitors each retain important and often essential roles in specific clinical settings.

The AAVBC believes the highest-value approach is not to favor one anticoagulant class universally, but to **support a stewardship model that matches the right therapy to the right patient at the right time**. This includes evidence-based initiation, renal- and weight-informed dosing, proactive interaction review, peri-procedural planning, reassessment of treatment duration, and strong transitions of care. It also requires **attention to practical realities** that shape outcomes in the real world, including **medication affordability**, **monitoring access**, **health literacy**, **adherence barriers**, and **institutional readiness to manage bleeding emergencies**.

The value-based opportunity is substantial. Preventable bleeding admissions, readmissions, dosing errors, prolonged unnecessary therapy, and fragmented discharge transitions remain **major drivers of avoidable cost and harm**. Conversely, organizations that standardize anticoagulation pathways, improve medication reconciliation, align formularies, use pharmacist-supported monitoring, and strengthen post-discharge follow-up can meaningfully improve both quality and total cost of care.

In conclusion, AAVBC supports an anticoagulant strategy that is:

- Guideline-aligned
- Optimized for cost through the use of generics when appropriate
- Patient-centered and individualized

- Operationally feasible across care settings
- Responsive to renal function, bleeding risk, and drug interactions
- Sustainable from both a patient affordability and VBC resource perspective

The overarching principle is clear: **optimize anticoagulant use to prevent thromboembolic events while minimizing avoidable bleeding, unnecessary utilization, and fragmentation of care.** This is where safer care, better patient outcomes, and stronger value-based performance converge.

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