2017 ACC EXPERT CONSENSUS DECISION PATHWAY

Management of Bleeding in Patients on Oral Anticoagulants

ALGORITHMS FOR CONSIDERATION

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2017 ACC Expert Consensus Decision Pathway for Management of Bleeding in Patients on Oral Anticoagulants

A REPORT OF THE AMERICAN COLLEGE OF CARDIOLOGY TASK FORCE ON EXPERT CONSENSUS DECISION PATHWAYS

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The ACC convened this writing committee to address the clinical problem of bleeding management of patients treated with anticoagulants and will consider both DOACs and VKAs used for any indication. The decision pathway considered the severity of the bleed (major vs. non-major), acute medical and surgical management, the need for reversal, the appropriateness and time of restarting anticoagulation, and the impact of pertinent comorbidities and concomitant drug therapy.

The following resource contains Figures and Tables from the 2017 Decision Pathway which focuses on the management of bleeding in patients being treated with DOACs and VKAs for any indication. This resource is only an excerpt from the Decision Pathway published in the Journal of the American College of Cardiology and the full publication should be reviewed for important context and additional information.

Table of Contents

FIGURE 1
Summary Graphic .......................................................... 1

FIGURE 2
Assessing Bleed Severity and
Managing Major and Non-Major Bleeds .............................. 2

FIGURE 3
Guidance for Administering Reversal Agents ......................... 3

FIGURE 4
Considerations for Restarting Anticoagulation ...................... 4

FIGURE 5
Restarting Anticoagulation .............................................. 5

FIGURE 6
Factors to Consider in Delaying Restart of Anticoagulation ...... 6

TABLES
Critical Site Bleeds ............................................................ 7
Suggestions for Laboratory Measurement of
DOACs When Specialized Assays are Available .................... 7
Suggestions for Laboratory Measurement of
DOACs When Specialized Assays are not Available ............... 8
Recommended Durations for Withholding DOACs
Based on Procedural Bleed Risk and Estimated CrCL
When There Are No Increased Patient Risk Factors .......... 8
Available Reversal Agents and Suggested Use ...................... 9
Indications for Anticoagulation with High Thrombotic Risk .... 9
Components of the Clinician-Patient Discussion .................... 10
FIGURE 1.
Summary Graphic

DOES ≥1 OF THE FOLLOWING FACTORS APPLY?
- Bleeding at a critical site (see Table 1)
- Hemodynamic instability
- Clinically overt bleeding with hemoglobin decrease ≥2 g/dL or administration of ≥2 units RBCs

YES

Bleed is considered major

NO

Bleed is considered non-major

ACCESS AND IDENTIFY SEVERITY OF BLEED

MANAGE AND CONTROL BLEED

Does the bleed require hospitalization, surgical/procedural intervention or transfusion?

YES

Stop OAC
Initiate appropriate measures to control bleeding

Continue OAC
Initiate appropriate measures to control bleeding

NO

Is the bleed at a critical site or life threatening?

YES

Stop OAC
Initiate appropriate measures to control bleeding

Administer suggested reversal agent* to control bleeding and stabilize patient

NO

Did above measures control bleeding?

YES

Stop OAC
Initiate appropriate measures to control bleeding

NO

Does the bleed require hospitalization, surgical/procedural intervention or transfusion?

Once patient is stable, is there a clinical indication for continued OAC?

NO

YES

DOES ≥1 FOLLOWING FACTORS APPLY?
- Bleed occurred in a critical site (see Table 1)
- Patient is at high risk of rebleeding or of death/disability with rebleeding
- Source of bleed has not yet been identified
- Surgical or invasive procedures are planned
- Patient does not wish to restart OAC at this time (see Table 7)

YES

Suggest discontinuing anticoagulation

NO

Suggest delaying restart of anticoagulation

Suggest restarting anticoagulation

DOAC = direct oral anticoagulants; OAC = oral anticoagulants, including DOACs and VKAs; PCCs = prothrombin complex concentrates; RBCs = red blood cells; VKK = vitamin K; VKA = Vitamin K antagonist

*Reversal agents include depletion strategies such as PCCs, plasma, VKK, and specific reversal agents for DOACs (e.g., idarucizumab for dabigatran).
**FIGURE 2.**
Assessing Bleed Severity and Managing Major and Non-Major Bleeds

**DOES ≥1 OF THE FOLLOWING FACTORS APPLY?**
- Bleeding at a critical site (See Table 1)
- Hemodynamic instability
- Clinically overt bleeding with hemoglobin decrease ≥2 g/dL or administration of ≥2 units RBCs

---

**Bleed is considered major**

- **Yes:**
  - Stop OAC
  - If patient is on a VKA, give 5-10 mg IV VKK
  - Provide local therapy/ manual compression
  - Provide supportive care
  - If applicable, stop antiplatelet agent(s)
  - Assess for and manage comorbidities that could contribute to bleeding (e.g., thrombocytopenia, uremia, liver disease)
  - Consider surgical/procedural management of bleeding site

- **No:**
  - Bleed is considered non-major

---

**Bleed is considered non-major**

- **Yes:**
  - Does the bleed require hospitalization, surgical/procedural intervention or transfusion?

---

- **Yes:**
  - **Stop OAC**
  - If patient is on a VKA, consider 2.5 mg PO/IV VitK
  - If patient not on VKA, do not administer reversal agent
  - Provide local therapy/ manual compression
  - Provide supportive care
  - If applicable, stop antiplatelet agent(s)
  - Assess for and manage comorbidities that could contribute to bleeding (e.g., thrombocytopenia, uremia, liver disease)
  - Consider surgical/procedural management of bleeding site

- **No:**
  - Consider continuing OAC (provided there is an appropriate indication)
  - Provide local therapy/ manual compression
  - If patient is on concomitant antiplatelet therapy, assess risks and benefits of stopping
  - Assess for and manage comorbidities that could contribute to bleeding (e.g., thrombocytopenia, uremia, liver disease)
  - Determine if dosing of OAC is appropriate

---

**Suggest administering reversal agent* (See Figure 3)**

---

**Did the above measures control the bleed?**

---

**Once patient is stable, consider restarting anticoagulation (see Figure 4)**

---

**DOSING = direct oral anticoagulant; IV = intravenous; OAC = oral anticoagulant, including DOACs and VKAs; PCCs = prothrombin complex concentrates; PO = per os “by mouth”; RBCs = red blood cells; VitK = vitamin K; VKA = Vitamin K antagonist**

*Reversal agents include depletion strategies such as PCCs, plasma, VitK, and specific reversal agents for DOACs (e.g., idarucizumab for dabigatran).
FIGURE 3. 
Guidance for Administering Reversal Agents*

**WHICH OAC IS THE PATIENT CURRENTLY TAKING?**

- **VKA (warfarin)**
  - Administer 4F-PCC:
    - INR 2-4, 25 units/kg
    - INR 4-6, 35 units/kg
    - INR >6, 50 units/kg
  - Or low fixed-dose option
    - 1000 units for any major bleed
    - 1500 units for intracranial hemorrhage
    - If 4F-PCC not available, use plasma 10–15 mL/kg

- **DTI (dabigatran)**
  - Administer 5g idarucizumab IV
  - If idarucizumab is not available, administer 4F-PCC or aPCC 50 units/kg IV
  - Consider activated charcoal for known recent ingestion (within 2-4 hours)

- **FXa Inhibitor (apixaban, edoxaban, rivaroxaban)**
  - Administer 4F-PCC 50 units/kg IV
  - If 4F-PCC unavailable, consider aPCC 50 units/kg IV
  - Consider activated charcoal for known recent ingestion (within 2-4 hours)

Once patient is stable, consider restarting anticoagulation (see Figure 4)

---

4F-PCC = four-factor prothrombin complex concentrate; aPCC = activated prothrombin complex concentrate; DOAC = direct oral anticoagulant; DTI = direct thrombin inhibitor; FXa = Factor Xa; INR = international normalized ratio; IV = intravenous; OAC = oral anticoagulant, including DOACs and VKAs; PCCs = prothrombin complex concentrates; VK = vitamin K; VKA = Vitamin K Antagonist.

*Reversal agents include replacement strategies such as PCCs, plasma, VK, and specific reversal agents for DOACs (e.g., idarucizumab for dabigatran).

† When PCCs are used to reverse VKAs, VK should also always be given (see Figure 2 for dosing guidance).

‡ If bleeding persists after reversal and there is laboratory evidence of a persistent dabigatran effect, or if there is concern for a persistent anticoagulant effect before a second invasive procedure, a second dose of idarucizumab may be reasonable.

§ Refer to prescribing information for more units.

FIGURE 4. Considerations for Restarting Anticoagulation

DOES ≥1 OF THE FOLLOWING CLINICAL INDICATIONS APPLY?
- PAF with CHA₂DS₂-VASc score ≤1
- Temporary indication of OAC: postsurgical prophylaxis, OAC after an anterior MI without LV thrombus, recovered acute stress cardiomyopathy (e.g., Takotsubo cardiomyopathy, first-time provoked DVT >3 months ago, bioprosthetic valve placement >3 months ago)

YES  NO

Suggest discontinuing anticoagulation

DOES ≥1 OF THE FOLLOWING FACTORS APPLY?
- Bleed occurred in a critical site (see Table 1)
- Patient is at high risk of rebleeding or of death/disability with rebleeding
- Surgical/invasive procedure planned
- After informed discussion, patient declines or does not wish to restart OAC at this time (see Table 7)

YES  NO

Suggest delaying restarting anticoagulation (see Figure 6)
Suggest restarting anticoagulation (see Figure 5)

AF = atrial fibrillation; CHA₂DS₂-VASc = clinical prediction rule for estimating the risk of stroke in patients with non-rheumatic AF; DOAC = direct oral anticoagulant; DVT = deep vein thrombosis; LV = left ventricular; MI = myocardial infarction; OAC = oral anticoagulant, including VKAs and DOACs; PAF = paroxysmal atrial fibrillation; VKA = vitamin K antagonist
FIGURE 5. Restarting Anticoagulation

DOES THE PATIENT FALL INTO 1 OF THE FOLLOWING GROUPS?
- NPO
- Cancer-associated VTE
- Awaiting an invasive procedure
- Pregnancy
- High risk of rebleeding
- Being bridged back to VKA with high thrombotic risk (See Table 6)

YES

Suggest temporary or long-term parenteral anticoagulation

NO

Is the patient on concomitant antiplatelet therapy?

YES

Suggest restarting anticoagulation

NO

Is the patient taking concurrent medications that interact with OAC levels? (e.g., antiretroviral, antifungal, antibiotics, antiarrhythmic such as amiodarone)

YES

Recommend pharmacy consultation and consideration of either switching OAC agent or interacting medication

NO

Reassess the severity of the bleed (See Figure 2)

YES

Exit pathway

NO

Did the above measures control the bleed?

CAD = coronary artery disease; DAPT = dual antiplatelet therapy; DOAC = direct oral anticoagulant; INR = international normalized ratio; NPO = nil per os or “nothing by mouth”; OAC = any oral anticoagulant, including VKAs and DOACs; PCI = percutaneous coronary intervention; VKA = vitamin K antagonist; VTE = venous thromboembolism.
FIGURE 6. Factors to Consider in Delaying Restart of Anticoagulation

- Is the patient willing to restart OAC at this time?
  - Yes ➔ See Table 7 for guidance on clinician/patient discussion
  - No ➔

- Is an urgent surgical/invasive procedure planned?
  - Yes ➔ Suggest delaying restarting anticoagulation until procedure performed
  - No ➔

- Did bleeding occur in a critical site (see Table 1)?
  - Yes ➔ Has sufficient time passed to consider restarting anticoagulation?
    - Yes ➔ Suggest restarting anticoagulation (see Figure 9).
    - No ➔
  - No ➔

- Is the patient at high risk of rebleeding?
  - Yes ➔
  - No ➔

- Is the patient at low/moderate thrombotic risk?
  - Yes ➔ 1. Use clinical judgment and consider patient values/preferences
    2. If indicated, start temporary anticoagulation for VTE prophylaxis
    3. Delay OAC for a short duration and reassess
  - No ➔

- Patient is at high thrombotic risk:
  1. Use clinical judgment and consider patient values/preferences
  2. If indicated, start temporary parenteral anticoagulation with IV heparin or pharmacological VTE prophylaxis until bleeding risk decreases
  3. Consider nonpharmacologic therapies if the patient is a candidate

- Is there evidence of bleeding?
  - Yes ➔ Reassess the severity of the bleed (see Figure 2)
  - No ➔
# TABLE 1  Critical Site Bleeds

<table>
<thead>
<tr>
<th>Type of Bleed</th>
<th>Initial Signs and Symptoms</th>
<th>Potential Consequences of Bleed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intracranial hemorrhage:</strong></td>
<td>Unusually intense headache, emesis</td>
<td>Stupor or coma</td>
</tr>
<tr>
<td>includes intraparenchymal, subdural,</td>
<td><strong>Neurological signs:</strong> e.g., reduced LOC, vision changes, numbness,</td>
<td>Permanent neurological deficit</td>
</tr>
<tr>
<td>epidural, and subarachnoid hemorrhages</td>
<td>weakness, aphasia, ataxia, vertigo, seizures</td>
<td>Death</td>
</tr>
<tr>
<td><strong>Other central nervous system</strong></td>
<td><strong>Intraocular:</strong> monocular eye pain, vision changes, blindness</td>
<td><strong>Intraocular:</strong> permanent vision loss</td>
</tr>
<tr>
<td>hemorrhage: includes Intraocular,</td>
<td><strong>Spinal:</strong> back pain, bilateral extremity weakness or numbness,</td>
<td><strong>Spinal:</strong> permanent disability, paraplegia,</td>
</tr>
<tr>
<td>intra- or extra-axial spinal hemorrhages</td>
<td>bowel or bladder dysfunction, respiratory failure</td>
<td>quadriplegia, death</td>
</tr>
<tr>
<td><strong>Pericardial tamponade</strong></td>
<td>Shortness of breath, tachypnea</td>
<td>Cardiogenic shock</td>
</tr>
<tr>
<td></td>
<td>Hypotension, jugular venous distension</td>
<td>Death</td>
</tr>
<tr>
<td></td>
<td>Tachycardia, muffled heart sounds, rub</td>
<td></td>
</tr>
<tr>
<td><strong>Airway, including posterior epistaxis</strong></td>
<td><strong>Airway:</strong> hemoptysis, shortness of breath, hypoxia</td>
<td>Hypoxemic respiratory failure, Death</td>
</tr>
<tr>
<td></td>
<td><strong>Posterior epistaxis:</strong> profuse epistaxis, hemoptysis, hypoxia,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>shortness of breath</td>
<td></td>
</tr>
<tr>
<td><strong>Hemothorax, intra-abdominal bleeding,</strong></td>
<td><strong>Hemothorax:</strong> tachypnea, tachycardia, hypotension</td>
<td><strong>Hemothorax:</strong> respiratory failure</td>
</tr>
<tr>
<td>and RPH</td>
<td><strong>Intra-abdominal (non-gastrointestinal):</strong> abdominal pain,</td>
<td><strong>RPH:</strong> femoral neuropathy</td>
</tr>
<tr>
<td></td>
<td>distention, hypotension, tachycardia</td>
<td><strong>All:</strong> hypovolemic shock, death</td>
</tr>
<tr>
<td><strong>Extremity bleeds:</strong> includes intramuscular and intra-articular bleeding</td>
<td><strong>Intramuscular:</strong> pain, swelling, pallor, paresthesia, weakness,</td>
<td><strong>Intramuscular:</strong> compartment syndrome, paralysis,</td>
</tr>
<tr>
<td></td>
<td>diminished pulse</td>
<td>limb loss</td>
</tr>
<tr>
<td></td>
<td><strong>Intra-articular:</strong> joint pain, swelling, decreased range of motion</td>
<td><strong>Intra-articular:</strong> irreversible joint damage</td>
</tr>
</tbody>
</table>

LOC = loss of consciousness; RPH = retropertioneal hematoma.

# TABLE 2  Suggestions for Laboratory Measurement of DOACs When Specialized Assays are Available

<table>
<thead>
<tr>
<th>Drug</th>
<th>Clinical Objective</th>
<th>Exclude Clinically Relevant Test</th>
<th>Measure On-Therapy or Above On-Therapy Drug Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Suggested Test</td>
<td>Interpretation</td>
</tr>
<tr>
<td>Dabigatran</td>
<td></td>
<td>Dilute TT, ECT</td>
<td>Normal result probably excludes clinically relevant levels</td>
</tr>
<tr>
<td>Apixaban, edoxaban, or rivaroxaban</td>
<td></td>
<td>Anti-Xa</td>
<td>Absent chromogenic anti-Xa assay activity probably excludes clinically relevant levels</td>
</tr>
</tbody>
</table>

*The term “clinically relevant” refers to DOAC levels that may contribute to bleeding or surgical bleeding risk. The minimum DOAC level that may contribute to bleeding or surgical bleeding risk is unknown. The International Society on Thrombosis and Hemostasis recommends consideration of anticoagulant reversal for patients with serious bleeding and a DOAC level >50 ng/mL, and for patients requiring an invasive procedure with high bleeding risk and a DOAC level >30 ng/mL (17). It is useful for quantification of plasma drug levels only when calibrated with the drug of interest.

Anti-Xa = anti-factor Xa; aPTT = activated partial thromboplastin time; DOAC = direct-acting oral anticoagulant; ECA = ecarin chromogenic assay; ECT = ecarin clotting time; PT = prothrombin time; TT = thrombin time.
### Table 3: Suggestions for Laboratory Measurement of DOACs When Specialized Assays are not Available

<table>
<thead>
<tr>
<th>Drug</th>
<th>Exclude Clinically Relevant* Drug Levels</th>
<th>Determine Whether On-Therapy or Above On-Therapy Levels Are Present</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Suggested Test</td>
<td>Interpretation</td>
</tr>
<tr>
<td>Dabigatran</td>
<td>TT, aPTT</td>
<td>Normal TT excludes clinically relevant levels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prolonged TT does not discriminate between clinically important and insignificant levels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Normal aPTT usually excludes clinically relevant levels, if a sensitive reagent is used.</td>
</tr>
<tr>
<td>Apixaban</td>
<td>None</td>
<td>Normal PT and aPTT do not exclude clinically relevant levels</td>
</tr>
<tr>
<td>Edoxaban or rivaroxaban</td>
<td>None</td>
<td>Normal PT and aPTT do not exclude clinically relevant levels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prolonged PT suggests that on-therapy or above on-therapy levels are present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Normal PT may not exclude on-therapy levels, particularly if a relatively insensitive PT reagent is used</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Normal PT suggests that on-therapy or above on-therapy levels are present</td>
</tr>
</tbody>
</table>

*The term “clinically relevant” refers to DOAC levels that may contribute to bleeding or surgical bleeding risk. The minimum DOAC level that may contribute to bleeding or surgical bleeding risk is unknown. The International Society on Thrombosis and Hemostasis recommends consideration of anticoagulant reversal for patients with serious bleeding and a DOAC level >50 ng/mL, and for patients requiring an invasive procedure with high bleeding risk and a DOAC level >30 ng/mL. (17).

Anti-Xa = anti-factor Xa; aPTT = activated partial thromboplastin time; DOAC = direct-acting oral anticoagulant; PT = prothrombin time; TT = thrombin time.

### Table 4: Recommended Durations for Withholding DOACs Based on Procedural Bleed Risk and Estimated CrCl When There Are No Increased Patient Bleed Risk Factors

<table>
<thead>
<tr>
<th></th>
<th>Dabigatran</th>
<th>Apixaban, Edoxaban, or Rivaroxaban</th>
</tr>
</thead>
<tbody>
<tr>
<td>CrCl mL/min</td>
<td>≥80</td>
<td>≥30</td>
</tr>
<tr>
<td></td>
<td>50-79</td>
<td>15-29</td>
</tr>
<tr>
<td></td>
<td>30-49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15-29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;15</td>
<td></td>
</tr>
<tr>
<td>Estimated drug half-life, h</td>
<td>13</td>
<td>Apixaban: 17</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Edoxaban: 17</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Rivaroxaban: 9</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30 (off dialysis)</td>
<td>Apixaban: 17 (off dialysis)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Edoxaban: 10-17 (off dialysis)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rivaroxaban: 13 (off dialysis)</td>
</tr>
<tr>
<td>Procedural bleed risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>≥24 h</td>
<td>≥24 h</td>
</tr>
<tr>
<td></td>
<td>≥36 h</td>
<td>≥36 h</td>
</tr>
<tr>
<td></td>
<td>≥48 h</td>
<td>≤120 h</td>
</tr>
<tr>
<td></td>
<td>No data. Consider measuring dTT and/or withholding ≥96 h</td>
<td>No data. Consider measuring agent-specific anti Xa level and/or withholding ≥48 h</td>
</tr>
<tr>
<td>Uncertain, intermediate, or high</td>
<td>≥48 h</td>
<td>No data. Consider measuring agent-specific anti Xa level and/or withholding ≥72 h</td>
</tr>
<tr>
<td></td>
<td>≥72 h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>≥96 h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>≥120 h</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** The duration for withholding is based upon the estimated DOAC half-life withholding times of 2 to 3 half-lives for low procedural bleeding risk and 4 to 5 drug half-lives for uncertain, intermediate, or high procedural bleeding risk (47-55).

CrCl = creatinine clearance; DOAC = direct-acting oral anticoagulant; dTT = dilute thrombin time.
**TABLE 5**  
Available Reversal Agents and Suggested Use

<table>
<thead>
<tr>
<th>Reversal Agent</th>
<th>Vitamin K Antagonists (Warfarin)</th>
<th>Factor IIa Inhibitor (Dabigatran)</th>
<th>Factor Xa Inhibitor (Apixaban, Edoxaban and Rivaroxaban)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4F-PCC (56)</td>
<td>First line</td>
<td>Second line</td>
<td>First line</td>
</tr>
<tr>
<td>aPCC</td>
<td>Not indicated</td>
<td>Second line</td>
<td>Second line</td>
</tr>
<tr>
<td>Idarucizumab</td>
<td>Not indicated</td>
<td>First line</td>
<td>Not indicated</td>
</tr>
<tr>
<td>Plasma</td>
<td>If 4-PCC is unavailable</td>
<td>Not indicated</td>
<td>Not indicated</td>
</tr>
</tbody>
</table>

4F-PCC = 4-factor prothrombin complex concentrate; aPCC = activated prothrombin complex concentrate.

**TABLE 6**  
Indications for Anticoagulation With High Thrombotic Risk

<table>
<thead>
<tr>
<th>Indication</th>
<th>Patient Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical valve prosthesis</td>
<td>- Mechanical valve + additional thrombotic considerations: AF, CHF, prior stroke/TIA</td>
</tr>
<tr>
<td></td>
<td>- Caged-ball or tilting disc aortic valve prosthesis</td>
</tr>
<tr>
<td></td>
<td>- Stroke/TIA within 6 months</td>
</tr>
<tr>
<td>AF</td>
<td>- AF with CHA2DS2-VASc score ≥4 (or CHA2DS2-VASc score ≥6) (9/4)</td>
</tr>
<tr>
<td></td>
<td>- Stroke/TIA within 3 months</td>
</tr>
<tr>
<td></td>
<td>- Stroke risk ≥10% per year</td>
</tr>
<tr>
<td></td>
<td>- Rheumatic valve disease or mitral stenosis</td>
</tr>
<tr>
<td>VTE</td>
<td>- VTE within 3 months</td>
</tr>
<tr>
<td></td>
<td>- History of unprovoked or recurrent VTE</td>
</tr>
<tr>
<td></td>
<td>- Active cancer and history of cancer-associated VTE</td>
</tr>
<tr>
<td>Prior thromboembolism with interruption of anticoagulation</td>
<td></td>
</tr>
<tr>
<td>Left ventricular or left atrial thrombus</td>
<td></td>
</tr>
<tr>
<td>Left ventricular assist device (LVAD)</td>
<td></td>
</tr>
</tbody>
</table>

AF = atrial fibrillation; CHF = congestive heart failure; TIA = transient ischemic attack; VTE = venous thromboembolism.
### TABLE 7 Components of the Clinician-Patient Discussion

<table>
<thead>
<tr>
<th>Factors to Consider</th>
<th>Discussion Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timing</td>
<td>Discussion of reinitiation of anticoagulation should be done in advance of restarting to give the patient time to formulate questions</td>
</tr>
<tr>
<td>Associated risks</td>
<td>Clinical and site-specific signs of bleeding for which the patient should remain vigilant (e.g., melena after a GI bleed)</td>
</tr>
<tr>
<td></td>
<td>Recurrent bleeding thrombotic event (personalized risk assessment if possible, e.g., CHA₂DS₂-VASc prediction of thromboembolism risk)</td>
</tr>
<tr>
<td></td>
<td>Discussion of the sequelae of a thromboembolic event (e.g., higher mortality for ischemic strokes with AF)</td>
</tr>
<tr>
<td>Associated benefits</td>
<td>Improved mortality with no increase in bleeding after certain types of bleeds on anticoagulant (e.g., GI bleeding)</td>
</tr>
</tbody>
</table>

AF = atrial fibrillation; GI = gastrointestinal.
Expert Consensus Decision Pathways

ACC has modernized Expert Consensus Documents to target key points of care with concise decision pathways rather than the traditional longer documents. These newly rebranded Expert Consensus Decision Pathways (ECDPs) leverage the expert insights drawn from a multidisciplinary group of experts and relevant stakeholders who are convened for Roundtables and Think Tanks often held as part of ACC quality programs.

ECDPs are intended to provide guidance for clinicians in areas where evidence may be limited, new and evolving, or lack sufficient data to fully inform clinical decision making. They include algorithms that are more actionable and can be translated into tools or apps to further accelerate the use of ACC clinical policy at point of care.

Translated Into Clinical Apps

While an app for bleed management is currently in development, the ACC offers a suite of clinical apps dedicated to improving quality of anticoagulation care.

AnticoagEvaluator App

This app helps clinicians make informed decisions on antithrombotic therapy for their non-valvular AFib patients. The app calculates a patient’s CHA2DS2-VASc and HAS-BLED scores to provide an assessment of stroke and bleed risk associated with therapeutic options vs. no therapy, and calculates creatinine clearance to provide accurate dosing.

BridgeAnticoag App

This app supports clinicians across specialties in safely managing anticoagulation around an invasive procedure for NVAF patients. The app calculates patient and procedural risk to provide individualized advice that balances bleed and stroke risk. Clinicians can use the app to assess whether and when to interrupt, whether and how to bridge, and how to restart anticoagulation.

To access other relevant ACC mobile tools and apps, visit ACC.org/Apps