# Sentinel Event Alert

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## Managing the risks of direct oral anticoagulants

An elderly woman on anticoagulant therapy for atrial fibrillation slipped on ice, fell and hit her head. After a brief loss of consciousness, she awoke and was taken to the hospital as a precautionary measure by her daughter. In the emergency department, she was found to have a subdural hematoma. To minimize bleeding, she was given fresh frozen plasma (FFP). While she was awaiting surgery in pre-op, her anesthesiologist noticed that home medications included a direct oral anticoagulant (DOAC) rather than warfarin. The physician consulted with the hospital pharmacist, who advised reversal with the specific antidote for the prescribed DOAC. Surgery was briefly and appropriately delayed to administer this medication; after receiving the reversal agent, she underwent successful surgical evacuation of subdural hematoma. After surgery, she regained consciousness without neurological deficits and was discharged on the second post-operative day in stable condition.

This scenario illustrates that serious and potentially deadly consequences related to bleeding risks for patients on DOACs can be avoided with appropriate and timely treatment. Anticoagulants have been named second of the top 10 medications involved in error incidents causing death or serious harm.[1]

**DOACs include:**

Apixaban (Eliquis®)
Betrixaban (Bevyxxa®)
Dabigatran (Pradaxa®)
Edoxaban (Savaysa®)
Rivaroxaban (Xarelto®)

While DOACs offer ease of use to patients, stopping bleeding events in patients on DOACs is more complicated, requiring different strategies than those for patients on warfarin (Coumadin®) and heparin. Unlike the more widely available reversal agents for warfarin and heparin, reversal agents for DOACs are lesser known and may not be available in every care setting.[2] Also, some DOACs have no FDA-approved reversal agent at this time.[3] Therefore, bleeding complications can be severe if these patients are not assessed according to guidelines on the management of DOACs.[2] Intracranial hemorrhage is the most serious emergent bleeding risk.

In response to an increase in adverse events related to these widely prescribed medications, this alert provides guidance on the safe use and management of DOACs to all medical practitioners and health care organization leaders, particularly chief medical officers, pharmacists, emergency department clinicians, and quality and safety officers. This patient safety concern applies to all settings — hospitals, ambulatory care, nursing care centers, home care, pharmacy, and behavioral health — because bleeding complications can stem from blunt trauma and other injuries treated in all of these settings.*

*Note: The Joint Commission's National Patient Safety Goal (NPSG) 03.05.01 that addresses anticoagulant therapy applies to hospitals, critical access hospitals, nursing care centers, and ambulatory care organizations that initiate, manage, and adjust dosage for anticoagulation medications. However, the information in this alert is relevant to providers in all care settings.

Published for Joint Commission accredited organizations and interested health care professionals, *Sentinel Event Alert* identifies specific types of sentinel and adverse events and high risk conditions, describes their common underlying causes, and recommends steps to reduce risk and prevent future occurrences.

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The Joint Commission

Prescribing, monitoring, and treating complications of DOAC therapy is similar in theory to heparin and warfarin therapy but **different in the types of agents and monitoring used**. Since being introduced as therapeutic agents, DOACs have required organizations to modify existing protocols and use evidence-based practice guidelines for initiating and maintaining all anticoagulation medications and their associated risk factors.[2,4,5] As a result of the introduction of DOACs, The Joint Commission revised its National Patient Safety Goal (NPSG) on anticoagulation, effective July 1, 2019, to assist organizations in designing systems of care to prevent quality and safety issues related to DOAC prescribing, monitoring, and treatment of severe bleeding.*

### Avoid using the wrong intervention for DOACs

Using evidence-based practice guidelines for DOACs can simplify anticoagulation therapy management, reducing the likelihood of prescribing errors.[4,5] It's essential to understand the risks, benefits, side effects, and potential antidotes or reversal agents for all kinds of anticoagulants,[2] as well as to communicate this information as appropriate to patients, their families and caregivers. Clinicians should be aware of the following critical facts to avoid the wrong intervention for patients taking DOACs:

***DOACs present different risks than heparin and warfarin and have different reversal mechanisms:*** DOACs include apixaban (Eliquis®), betrixaban (Bevyxxa®), dabigatran (Pradaxa®), edoxaban (Savaysa®), and rivaroxaban (Xarelto®). Clinicians may not always recognize these names as anticoagulants. Even if they do, clinicians may not fully understand that DOACs present different risks than heparin and warfarin. DOACs are very different than warfarin and heparin in dosing, monitoring, and treatment of complications.

***A reversal mechanism that works for one DOAC may not work for another.*** A DOAC-specific reversal agent may not be effective in treating another kind of DOAC.[2] For each anticoagulation medication used by patients coming to their organization, providers must be aware of variations in presentation severity (e.g., location and severity of bleeding, indication for reversal) and appropriate reversal agents (e.g., drug discontinuation, use of concentrated clotting therapy).[2,6,7]

***Perioperative assessment and communication are critical:*** Before surgery and outpatient procedures such as cardiac catheterization, interventional radiology and colonoscopies — perioperative assessment is critical to assess bleeding risk.[2,8] Communication about the specifics of a DOAC also is critical at transitions of care for many reasons.[5,7] **Especially important is avoiding therapeutic duplication.** Because not all providers are familiar with all DOACs, they may accidentally prescribe a second anticoagulant. Likewise, patients may not recognize these drugs as anticoagulants and may not be able to identify them when questioned.

### Actions Suggested by The Joint Commission

The *Journal of the American College of Cardiology* published the "2017 ACC Expert Consensus Decision Pathway on Management of Bleeding in Patients on Oral Anticoagulants" that provides guidelines for managing bleeding risks in patients and for administering reversal agents in patients taking DOACs.[2] In addition, a webinar series from The Joint Commission provides advice on this issue. The Joint Commission recommends that organizations take the following actions to protect patients on DOACs from the potentially deadly consequences related to bleeding risks:

1. Create name awareness for the various kinds of DOACs — apixaban (Eliquis®), betrixaban (Bevyxxa®), dabigatran (Pradaxa®), edoxaban (Savaysa®), and rivaroxaban (Xarelto®) — particularly among pharmacists, emergency department clinicians and providers who may be called upon to rapidly reverse life-threatening bleeding.

2. For each type of anticoagulant medication, use evidence-based protocols and practice guidelines for drug initiation and maintenance, reversal of anticoagulation and management of bleeding events,[2,6,7]

 

and perioperative management.[2,4,7,8,9] Use pharmacy staff as a resource for questions about DOACs. See the "Do it the Right Way" sidebar.

3. Have a written policy on the need for baseline and ongoing laboratory tests to monitor and adjust anticoagulant therapy.[10,11,12] For patients on a DOAC, follow evidence-based practice guidelines for baseline and ongoing laboratory tests to ensure that patients are monitored and dosed appropriately. Although DOACs are designed to be given at fixed doses and do not require routine coagulation monitoring, in some instances, the interpretation of coagulation laboratory results is important for optimal management of DOAC toxicity or reversal.[2] Consider monitoring renal and liver function for all patients and adjusting dosing regimen accordingly.

4. Include the particular DOAC's indications for use on the patient's prescription, in the instructions for the patient, and in the electronic medical record (EMR).

5. Address anticoagulation safety practices.[9,13]
   - Evaluate anticoagulation safety practices, and take actions to improve safety practices and measure the effectiveness of those actions in a time frame determined by the organization. Set goals to improve measures, such as reducing therapeutic duplication and bleeding events or increasing compliance with protocols or guidelines for perioperative management of patients on oral anticoagulants.
   - Establish a process to identify, respond to, and report adverse drug events, including adverse drug event outcomes.

6. Because DOACs are easy to use and rising in popularity, patients with DOAC prescriptions may not fully understand the risks of these medications. To reduce the risk of bleeding or clotting, provide education to patients and families specific to the anticoagulant medication prescribed,[5,7,14] including the following:
   - Adherence to medication dose and schedule.
   - Importance of follow-up appointments and laboratory testing (if applicable).
   - Potential drug-drug and drug-herb/supplement interactions.
   - Potential for adverse drug reactions and knowledge of how adverse reactions present.
   - When to contact the doctor or visit the emergency department.[15]

**Do it the Right Way**

For each type of anticoagulant medication, use evidence-based protocols and practice guidelines. Know the names of each kind of these medications and what they do.

For drug initiation and maintenance,[4] address:
- Medication selection.
- Dosing, including adjustments for age and renal or liver function.
- Drug-drug, drug-herb/supplement, and drug-food interactions.
- Other risk factors as applicable.

For reversal of anticoagulation and management of bleeding events, address:
- Variations in presentation severity (e.g., location and severity of bleeding, indication for reversal) and appropriate reversal agents (e.g., drug discontinuation, use of concentrated clotting therapy) for each kind of anticoagulant medication used by patients cared for by a health care organization.[2,6,7]
- Hospitals and critical access hospitals should stock blood products and any antidotes appropriate for use with each type of anticoagulant.[2]

For perioperative management, address:
- Use of bridging medications, timing for stopping an anticoagulant, and timing and dosing for restarting an anticoagulant.[2,6,8]
- The patient's bleeding risk and renal function, as well as the half-life of the medication.[2,4]

 

### Related Joint Commission requirements

The Joint Commission's NPSG.03.05.01 addresses anticoagulant therapy: *Reduce the likelihood of patient harm associated with the use of anticoagulant therapy*.

> Element of performance (EP) 4 addresses DOACs: *The organization has a written policy addressing the need for baseline and ongoing laboratory tests to monitor and adjust anticoagulant therapy. Note: For all patients receiving warfarin therapy, use a current international normalized ratio (INR) to monitor and adjust dosage. For patients on a direct oral anticoagulant (DOAC), follow evidence-based practice guidelines regarding the need for laboratory testing.*

Effective July 1, 2019, the NPSG applies to hospitals, critical access hospitals, nursing care centers, and ambulatory organizations that initiate, manage, and adjust dosage for anticoagulation medications. See the NPSGs for each program.*

### Resources

#### *The Joint Commission*

"Resources to support Joint Commission accredited organizations implementation of NPSG.03.05.01, effective July 2019: Reduce the likelihood of patient harm associated with the use of anticoagulant therapy," complimentary compendium of resources available to help organizations and practitioners.

R3 Report, Issue 19: National Patient Safety Goal for anticoagulant therapy, details the rationale and references that The Joint Commission employed in the development of the new requirements.

#### *American College of Cardiology*

"2017 ACC Expert Consensus Decision Pathway on Management of Bleeding in Patients on Oral Anticoagulants: A Report of the American College of Cardiology Task Force on Expert Consensus Decision Pathways," includes a decision tree for antidotes/reversal agents based on the DOAC that a patient is taking (see Figure 3 Guidance for Administering Reversal Agents).[2]

#### *Institute for Safe Medication Practices (ISMP)*

ISMP High-Alert Medication Learning Guides are aimed at patients or practitioners who want to educate patients, and include information about apixaban (Eliquis®), dabigatran (Pradaxa), rivaroxaban (Xarelto®), and warfarin (Coumadin®).

ISMP Medication Safety Self Assessment for High-Alert Medications can be used to assist interdisciplinary teams at health care organizations with proactively identifying opportunities for reducing patient harm when prescribing, storing, preparing, dispensing, and administering high-alert medications. It includes a section specific to anticoagulants, including DOACs (pages 68-71).[15]

#### *Clinical studies*

Two studies on the rate of adverse drug events with DOACs compared to warfarin:

- Monaco L, et al: Safety profile of the direct oral anticoagulants: An analysis of the WHO database of adverse drug reactions. *British Journal of Clinical Pharmacology*, July 2017;83(7):1532-1543. doi: 10.1111/bcp.13234. Epub 2017 Mar 19.[16]
- Eek AK, et al: Anticoagulant-associated adverse drug reactions in 2013-15. *Tidsskr Nor Laegeforen*, Aug. 21,2018;138(12). doi: 10.4045/tidsskr.17.0706. Print 2018 Aug 21.[17]

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**Patient Safety Advisory Group**
The Patient Safety Advisory Group informs The Joint Commission on patient safety issues and, with other sources, advises on topics and content for *Sentinel Event Alert*.

 