PATIENT SAFETY: ANTICOAGULATION STEWARDSHIP - IDENTIFYING KEY DATA, AVOIDING ERRORS, AND ENHANCING SAFETY

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Arthur E. Schwarting Symposium 2025

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DISCLOSURE

Dr. Bessada has no financial relationships with ineligible companies

2

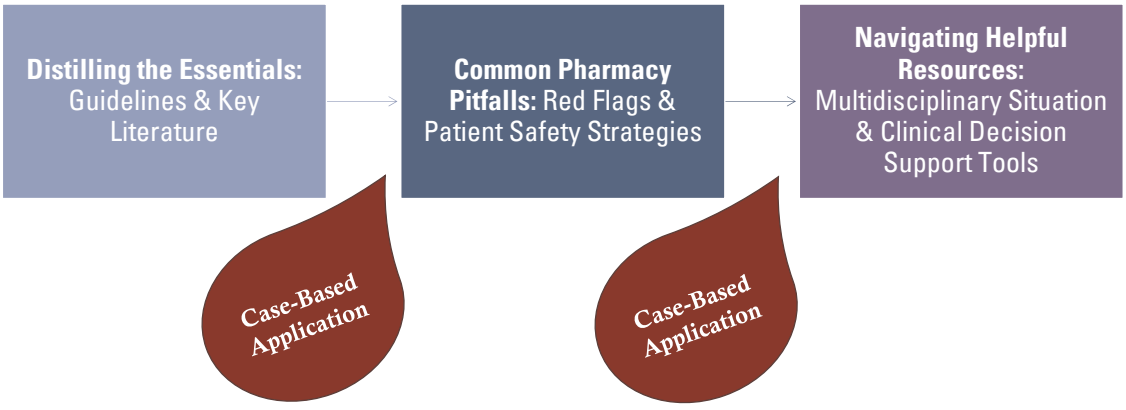
LEARNING OBJECTIVES

At the end of this presentation the learner should be able to:

- Differentiate high-priority, practice-changing information from less relevant or conflicting data after reviewing the anticoagulation guidelines, literature and clinical updates.
- Recognize common anticoagulation-related errors in pharmacy practice and implement strategies to minimize patient safety risks
- Identify red flag situations in anticoagulation management that pose patient safety risks.
- Determine the appropriate guidelines or evidence-based resources to guide clinical decision-making and referrals

3

OUR PATH TO MITIGATE INFORMATION OVERLOAD



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WHY THIS MATTERS: ANTICOAGULATION & PATIENT SAFETY

Anticoagulant Use Increasing

↓

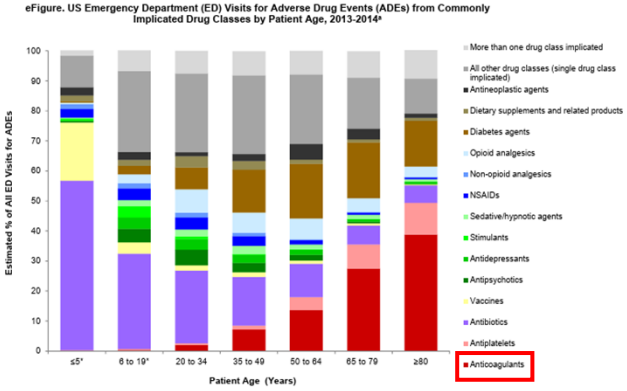
Adverse Events Increasing

↓

Elderly Impacted the Most

↓

Top Drug Class for Patient Harm



Burnett AE & Barnes GD. Res Pract Thromb Haemost. 2022 Jul 17;6(5):e12757.
Budnitz DS, et al. JAMA, 2021;326(13), 1299–1309.

Image from: Shehab N et al. JAMA. 2016 Nov 22;316(20):2115-2125.

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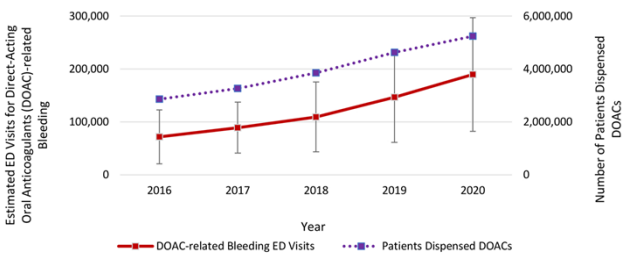
A NEED FOR ANTICOAGULATION STEWARDSHIP



DOAC-related ED visits	
2011	2.3%
2017	**37.9%**

Daily Pharmacy Practice Requires Constant Anticoagulation Stewardship:

- Renal dose adjustments
- Drug interactions
- Patient education
- Medication adherence
- Transition of care management

HOW DO I KEEP UP!?

Geller AI, et al. Thrombosis Research. 2023; 225, 110–115.
Burnett A, et al. Thrombosis Update. 2022;9:100125

Image from: Geller AI, et al. Thrombosis Research. 2023; 225, 110–115

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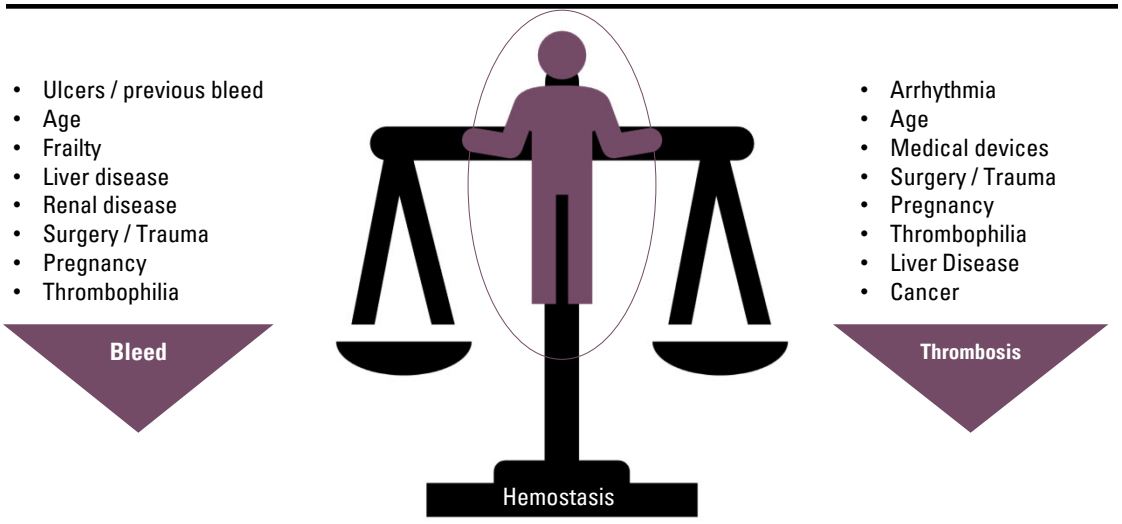
1. DISTILLING THE ESSENTIALS

Guidelines & Key Literature

7



Burnett A, et al. Thrombosis Update. 2022;9:100125

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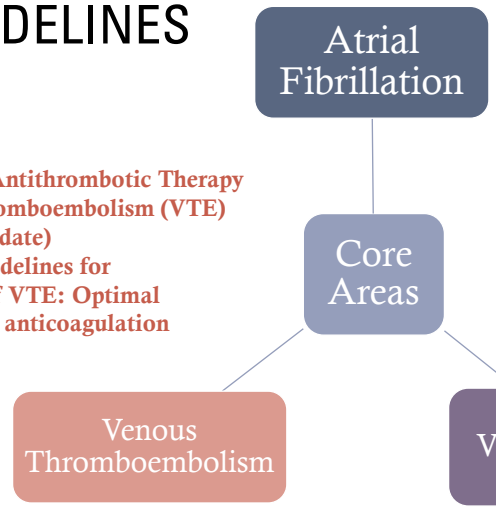
KEY GUIDELINES



2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation

- 2021 CHEST: Antithrombotic Therapy for Venous Thromboembolism (VTE) Disease (2nd Update)
- *2018 ASH Guidelines for Management of VTE: Optimal management of anticoagulation therapy

2020 ACC/AHA Guideline for the Management of Patients With Valvular Heart Disease

*ASH Guidelines are helpful for management of VTE in **special** populations (pediatrics, cancer, pregnant, thrombophilia etc.)*

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SITUATIONAL GUIDELINES

Perioperative Anticoagulation
- 2022 CHEST Perioperative Management of Antithrombotic

VTE Prophylaxis (Surgical & Medical)
- General: 2018 ASH Guidelines for VTE Prophylaxis
- Surgery-specific (e.g.
- Medical situation-specific (e.g. trauma)

Thrombophilia
- 2023 ASH Guidelines on Thrombophilia Testing

Reversal
- 2020 ACC Expert Consensus Decision Pathway on Management of Bleeding in Patients on Oral Anticoagulants

Cancer-Associated Thrombosis
- 2021 ASH Cancer-Associated VTE Guidelines
- National Comprehensive Cancer Network Thrombosis Guidelines

Special Populations
- Pregnancy (ASH)
- Extreme Weights (ISTH SSC)
- Liver Disease (ISTH SSC)

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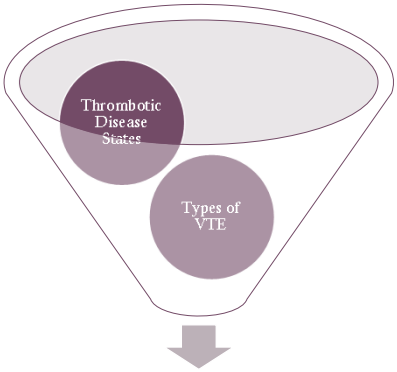
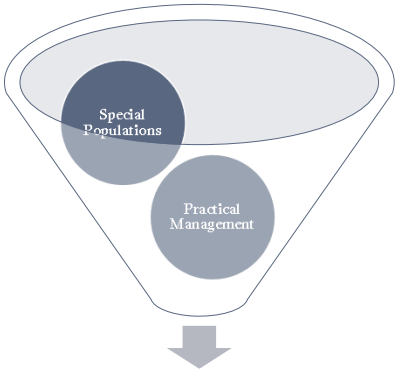
SITUATIONAL GUIDELINES



American Society of Hematology

In General…



International Society of Thrombosis & Hemostasis (SSC) & Anticoagulation Forum

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NAVIGATING CONFLICTING OR AMBIGUOUS RECOMMENDATIONS

Primary Literature	Expert Consensus Guidance	Real-World Outcomes Data

- Extended-Phase VTE Therapy in Cancer
- DOAC Use in Obesity
- Effectiveness of Rivaroxaban in Sleep Apnea

ORIGINAL ARTICLE

Extended Reduced-Dose Apixaban for Cancer-Associated Venous Thromboembolism

Authors: Isabelle Mahé, M.D., Ph.D. , Marc Carrier, M.D. , Didier Mayeur, M.D., Jean Chidiac, M.D., Eric Vicaut, M.D., Nicolas Falvo, M.D., Olivier Sanchez, M.D., Ph.D., +28 , for the API-CAT Investigators* Author Info & Affiliations

RECOMMENDATIONS AND GUIDELINES Free Access

Use of direct oral anticoagulants in patients with obesity for treatment and prevention of venous thromboembolism: Updated communication from the ISTH SSC Subcommittee on Control of Anticoagulation

Karlyn A. Martin, Jan Beyer-Westendorf, Bruce L. Davidson, Menno V. Huisman, Per Morten Sandset, Stephan Moll

Original Article

Effectiveness and Safety of Rivaroxaban Versus Warfarin among Nonvalvular Atrial Fibrillation Patients with Concomitant Obstructive Sleep Apnea

Nitesh Sood , Veronica Ashton , Youssef Bessada , Katelyn Galli , Brahim K. Bookhart , Craig I. Coleman

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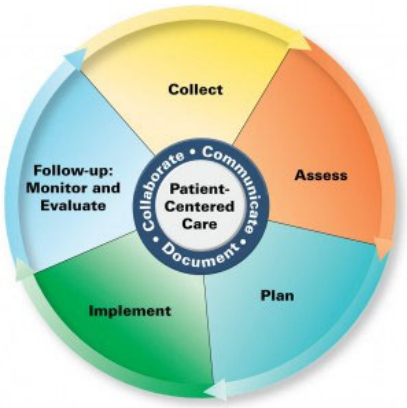
PRACTICAL APPROACHES TO FINDING THE CORRECT GUIDANCE



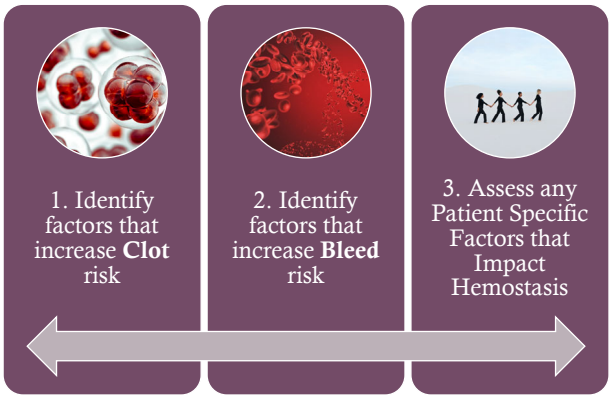


Image from: Joint Commission of Pharmacy Practitioners

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LET'S PRACTICE: **CASE 1**

You're reviewing a new consult for RW, a 67-year-old woman with a history of atrial fibrillation and a mechanical mitral valve who was recently admitted for pneumonia. Her inpatient team wants to transition her to a DOAC (rivaroxaban) instead of warfarin, stating that "it's easier and more convenient in the long-term" They ask you: "Is that safe?"

*Which of the following would be the **most appropriate, high-quality resource** to guide your recommendation in this scenario?*

a) Latest ACC/AHA guideline on antithrombotic therapy for valvular disease
b) A 2017 real-world case series from your favorite cardiology podcast
c) Your hospital's adult renal dosing policy

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LET'S PRACTICE: **CASE 1**

Bleed Risk
Clot Risk
Patient-Specific Factors

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c) Your hospital's adult renal dosing policy

4. In patients with mechanical heart valves with or without AF who require long-term anticoagulation with VKA to prevent valve thrombosis, NOACs are not recommended.[7]

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2. COMMON PHARMACY PITFALLS

Identifying Red Flags & Implementing Patient Safety Strategies

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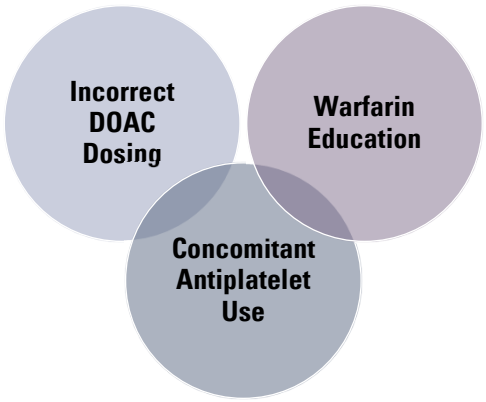
COMMON PHARMACIST-LED STEWARDSHIP



National Quality Forum & Anticoagulation Forum. Advancing Anticoagulation Stewardship: A Playbook. Accessed 2024 08 18

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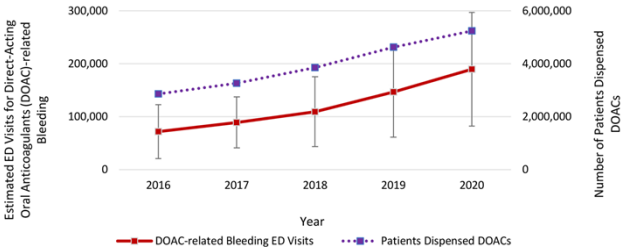
INCORRECT DOAC DOSING

Pharmacist's Role in Monitoring DOAC Dosing:

- **Indication**
- Renal function
- Liver Function
- Drug Interactions
- Patient Weight
- Presence of devices
- Phase of care in VTE (acute vs. extended)

3: Harm	B-NR

3. For patients with AF, nonevidence-based doses of DOACs should be avoided to minimize risks of pre-ventable thromboembolism or major bleeding and to improve survival.[11,12]



Journal of Hospital Medicine | shm

CHOOSE WISELY®: THINGS WE DO FOR NO REASON™

Things We Do for No Reason™: Dose adjusting apixaban in acute kidney injury

Katelyn J. Galli PharmD, Kathleen K. Adams PharmD

First published: 31 January 2024 | https://doi.org/10.1002/jhm.13289

Geller AI, et al. Thrombosis Research. 2023; 225, 110–115.
Burnett A, et al. Thrombosis Update. 2022;9:100125

Joglar JA *et al. Circulation.* 2024 Jan 2;149(1):e1-e156.
Chan KE et al. *Circulation.* 2015 Mar 17;131(11):972-9

Image from: Geller AI, et al. Thrombosis Research. 2023; 225, 110–115

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INCORRECT DOAC DOSING: "SORTING THE WHEAT FROM THE CHAFF"

Indication	Dose-Adjustment (Renal)	Monitor Carefully	AVOID
Atrial Fibrillation	*Apixaban (ABC's) *Rivaroxaban (Actual BW)	*Liver Disease (Child Pugh A&B^) *Certain Drug-Drug Interactions (diltiazem) *BMI >40kg/m2 or Wt <45kg or >120 *TAVI *LV Thrombus *Cancer *Duration of therapy (VTE)	*Rivaroxaban, edoxaban & dabigatran in CrCL <15 mL/min *All DOACs: Child-Pugh C *Major 3a4/p-gp inhibitors & inducers *Mechanical valves *Rheumatic & moderate-severe mitral stenosis *Luminal or GI Cancers *Severe antiphospholipid syndrome
VTE	All RCTs excluded CrCl <25-30 ml/min (apixaban some data)		

^While 2024 ISTH SSC recommend all DOACs in Child-Pugh B Cirrhosis, package inserts of rivaroxaban and edoxaban do not include this recommendation

Carlin S et al. *J Thromb Haemost.* 2024 Sep;22(9):2653-2669.
Martin KA et al. *J Thromb Haemost.* 2021 Aug;19(8):1874-1882

Burnett AE et al. *J Thromb Thrombolysis.* 2016 Jan;41(1):206-32
Joglar JA, et al. *Circulation.* 2024 Jan 2;149(1):e1-e156

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CONCOMITANT ANTIPLATELET USE

Pharmacist's Role in Concomitant Antiplatelet Use:

- Obtain full history for bleed, clot and patient-specific risk factors
- Ensure disease-state/surgery specific guidelines adhered to (e.g. **2025 ACC/AHA ACS guidelines**)
- Identify opportunities for de-escalation:

1	Patients over 70 yo using aspirin for primary prevention
2	Patients on DAPT therapy for > 12 months
3	Patients on Triple Antithrombotic therapy > 7-30 days or with high bleeding risk
4	Patients experiencing AFib/VTE requiring anticoagulation

Graphic adapted from Zedan M & Bessada Y. Aspirin De-escalation Opportunities in Antiplatelet Stewardship.. Cardiology Clinical Pearls. Aug 2024

Peters AT & Mutharasan RK.. *JAMA.* 2020;323(7):676
Arnett DK et al. *Circulation.* 2020 Jan 28;141(4):e60
Rao SV et al. *Circulation.* 2025 Apr;151(13):e771-e862.

Kumbhani DJ et al. *J Am Coll Cardiol.* 2021;77(5):629-658
Capodanno D et al. *J Am Coll Cardiol.* 2019;74(1):83-99.

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WARFARIN EDUCATION

Pharmacist's Role in Warfarin Education:

- Serve as expert source of guidance for medication/ lifestyle guidance
- Use patient-friendly terms
- Assist warfarin management in **transitions of care**
- Maximize time in therapeutic range through collaboration
- **Resources:**
  - Anticoagulation Forum: Patient & Family Education Apps
  - Michigan Anticoagulation Quality Improvement (MAQI) Patient Education Toolkits
  - American Heart Association Guide to Warfarin Toolkit

Image adapted from AC Forum Patient & Family Education Site. Available from: https://acforum.org/web/resource-center-details.php?selectTopic=1

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LET'S PRACTICE: CASE 2

SA is a 68-year-old male (wt: 82 kg) who comes in for a check-up to the primary care clinic you work at after an admission last week for a provoked DVT after a hip surgery he had 30 days prior. He was discharged on apixaban 10 mg BID for 7 days then told to switch to 5 mg BID, but "that it was all very fast, he could barely keep up." The medical resident seeing the patient message you the ambulatory care pharmacist worried because of the patient's history of chronic kidney disease (CrCl 48 ml/min). She wants to decrease the dose from 5mg BID today to 2.5 mg BID "to be safe."

1. What would be the error committed with this dose-reduction?
    a) There is minimal RCT evidence to support this switch, and it would go against package insert recommendations
    b) While RCT evidence does not support this switch, the abundance of real-world literature has warranted experts to recommend this unanimously
    c) There is no error, this is recommended for high bleed risk

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1. Which available resources could help you with your response? Select all that apply:
    a) There is minimal RCT evidence to support this switch, and it would go against package insert recommendations
    b) While RCT evidence does not support this switch, the abundance of real-world literature has warranted experts to recommend this unanimously
    c) There is no error, this is recommended for high bleed risk

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LET'S PRACTICE: CASE 2

Bleed Risk
Clot Risk
Patient-Specific Factors

SA is an 82-year-old male (wt: 85 kg) who comes in for a check-up to the primary care clinic you work at after an admission last week for a provoked DVT after a hip surgery he had 30 days prior. He was discharged on apixaban 10 mg BID for 7 days then told to switch to 5 mg BID, but "that it was all very fast, he could barely keep up." The medical resident seeing the patient message you the ambulatory care pharmacist worried because of the patient's history of chronic kidney disease (SCr 1.6, CrCl 43 ml/min). She wants to decrease the dose from 5 mg BID today to 2.5 mg BID "to be safe."

2. How do you respond?

a) Switch to 2.5 mg BID after 10mg BID x 7 days for bleed risk
b) Switch to 2.5 mg BID since the patient meets 2 of 3 criteria for apixaban renal adjustment in atrial fibrillation (age & serum creatinine)
c) Maintain 5 mg BID. Discuss with resident that apixaban dose should be 5mg BID for acute phase but can consider decreasing to 2.5mg BID in extended phase of VTE therapy or even discontinuation

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3. NAVIGATING HELPFUL RESOURCES

Multidisciplinary Situations & Clinical Decision Support Tools

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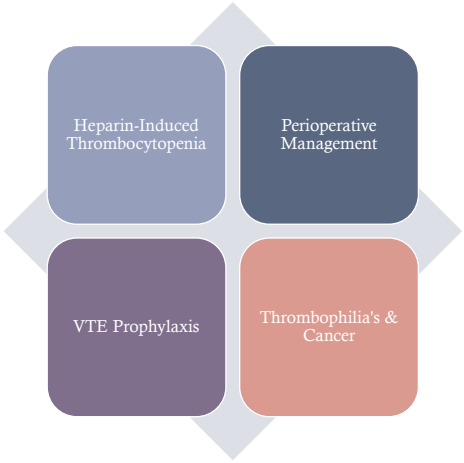
MULTIDISCIPLINARY STEWARDSHIP



National Quality Forum & Anticoagulation Forum. Advancing Anticoagulation Stewardship: A Playbook. Accessed 2024 08 18

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CLINICAL DECISION SUPPORT TOOLS

Risk Stratification	Treatment Pathways	Best Practice Alerts
• VTE prophylaxis risk (IMPROVE, IMPROVEDD & PADUA score) • VTE severity scores (WELLS & PESI score) • Bleed risk scores (IMPROVE-BLEED & HAS-BLED) • CHA2DS2VASc • GARFIELD-AF	• Pulmonary embolism response pathways • Low-risk DVT response pathway • 4T score for heparin-induced thrombocytopenia	• Incorrect DOAC dosing (according to evidence) • Antiplatelet de-escalation opportunities • VTE phase of care reminders

National Quality Forum & Anticoagulation Forum. Advancing Anticoagulation Stewardship: A Playbook. Accessed 2024 08 18

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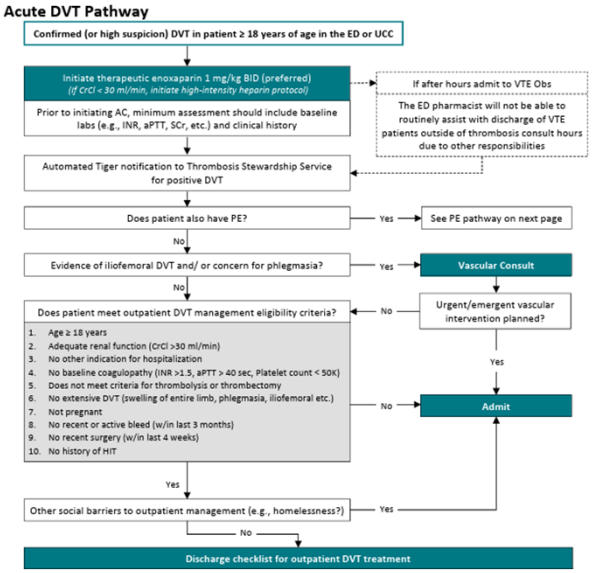
EXAMPLE LOW-RISK DVT DECISION PATHWAY



UNMH P&T Committee, Thrombosis & Hemostasis Steering Committee Last updated: July 2023. Available from: https://hsc.unm.edu/medicine/departments/emergency-medicine/_docs/clinical_resources/general-policies-and-guidelines/management-of-acute-vte-pathway_7_11_2023_aeb.pdf

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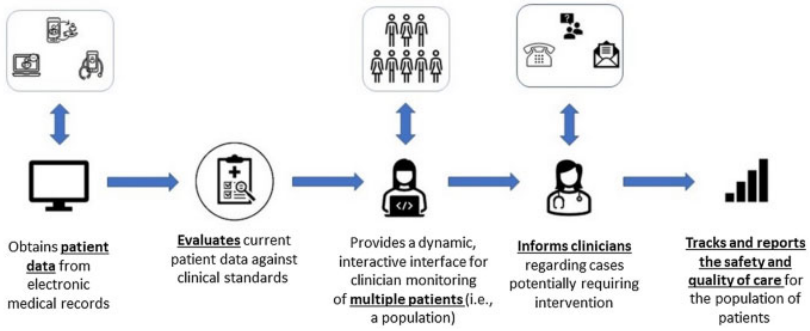
CLINICAL MONITORING TOOLS

Population Health & Monitoring Dashboards:



Imaged from Triller DM et al. J Thromb Thrombolysis. 2024 Jan;57(1):107-116

*"markedly reduced time to intervention (**16** versus **64** minutes) with the DOAC dashboard compared with traditional pharmacist case review…"*

Barnes GD et al (2024)

- Retrospective analysis of nationwide anticoagulant use within the Veteran Health system
- Assessed impact of "moderate" or "high" DOAC dashboard use from 2015-2019
- Observed **128,652** patients receiving DOAC therapy at 123 centers (AfFib & VTE)
- **All sites** observed a reduction in stroke or VTE (2.7/100 vs. 2.2/100 patient years after implementation

Slide adapted from Bessada Y. "Novel VTE Care Models" AC Forum National Conference 2025

Barnes GD et al. J Am Heart Assoc. 2024 Sep 17;13(18):e035859
Triller DM et al. J Thromb Thrombolysis. 2024 Jan;57(1):107-116
Valencia D et al. Ann Pharmacother. 2019 Aug;53(8):806-811.

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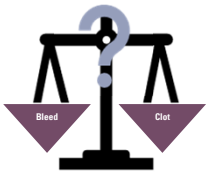
REFERRAL GUIDANCE: KNOWING WHEN YOU'RE OUT OF SCOPE

Core guidelines → Situational guidelines → High evidence primary literature → Expert consensus → Large scale Real-world data → Still Unclear?

OR

3. Shared Decision-Making (SDM) in AF Management.....e21

OR



= REFER!

Opportunities for Referral / Shared-Decision Making

Thrombophilia's	Hematology
Heparin-induced thrombocytopenia	Hematology / Lab medicine
Perioperative anticoagulation	Surgery / Cardiology / Outpatient AC Clinic
Cancer-associated VTE	Oncology / Surgery
Acute coronary syndromes	Cardiology
High-risk PE	Pulmonology / Hematology

Joglar JA *et al. Circulation.* 2024 Jan 2;149(1):e1-e156.
National Quality Forum & Anticoagulation Forum. Advancing Anticoagulation Stewardship: A Playbook. Accessed 2024 08 18

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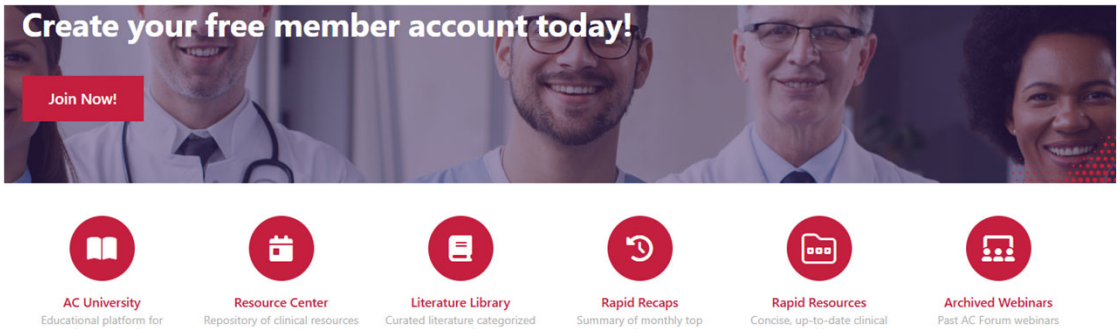

KEEPING UP WITH ANTICOAGULATION LITERATURE

Use Available (& Free) Resources!

- AC Forum Resource Center, Rapid Recaps, Webinars
- MAQI Compendium of Toolkits
- ACC "Latest in Cardiology" Trial Summaries
- ASH Guideline slide-sets & podcasts

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LET'S PRACTICE: CASE 3

CB is a 45-year-old female who had cardiac surgery 3 weeks ago and is now s/p CABG x 2. She has a PMH of hypertension, hyperlipidemia, obesity (BMI of 45 kg/m²) and persistent atrial fibrillation on apixaban 5mg BID. She is re-admitted to the hospital for attempted cardioversion to control her atrial fibrillation. While admitted she is switched from apixaban to an unfractionated heparin infusion. A day prior to cardioversion her platelet count drops from baseline 224 x 10^9/μL to 156. Later in the evening it drops again to 103. The morning of, the panicked cardiology fellow messages you as the platelets are now 67! He wants to stop the heparin drip.

How do you proceed?

a) Consult hematology

b) Conduct a 4T Score assessment prior to sending HIT panels

c) Stop the heparin and start apixaban

d) a & b

e) All the above

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Clot Risk
Patient-Specific Factors

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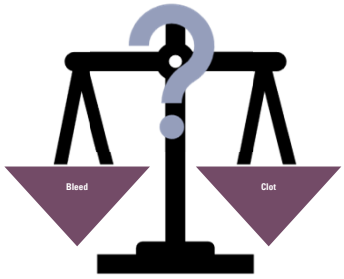
Clot Risk
Patient-Specific Factors

CB is a 45-year-old female who had cardiac surgery 3 weeks ago and is now s/p CABG x 2. She has a PMH of hypertension, hyperlipidemia, obesity (BMI of 45 kg/m²) and persistent atrial fibrillation on apixaban 5mg BID. She is re-admitted to the hospital for attempted cardioversion to control her atrial fibrillation. While admitted she is switched from apixaban to an unfractionated heparin infusion. A day prior to cardioversion her platelet count drops from baseline 224 x 10^9/µL to 156. Later in the evening it drops again to 103. The morning of, the panicked cardiology fellow messages you as the platelets are now 67! He wants to stop the heparin drip.

How do you proceed?

a) Consult hematology
b) Conduct a 4T Score assessment prior to sending HIT panels
c) Stop the heparin and start apixaban
d) a & b
e) All the above



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SUMMARY

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MANEUVERING THROUGH THE REALM OF ANTICOAGULATION STEWARDSHIP

Distilling the Essentials: Guidelines & Key Literature

- Identify core guidelines
- Utilize situational guidelines
- Collect & assess bleed, clot and patient-specific factors
- Don't forget primary literature, expert consensus statements, real-world outcomes

Common Pharmacy Pitfalls: Red Flags & Patient Safety Strategies

- Make evidence-based decisions based on indication of anticoagulation & patient-specific factors
- Especially keep an eye on:
  - DOAC dosing
  - Concomitant antiplatelets
  - Warfarin education
- You are the medication expert!

Navigating Helpful Resources: Multidisciplinary Situation & Clinical Decision Support Tools

- Use clinical decision support tools & technology to your advantage
- Utilize population health to optimize more with less
- When faced with clinical conundrums beyond the evidence - REFER

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QUESTIONS?

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