



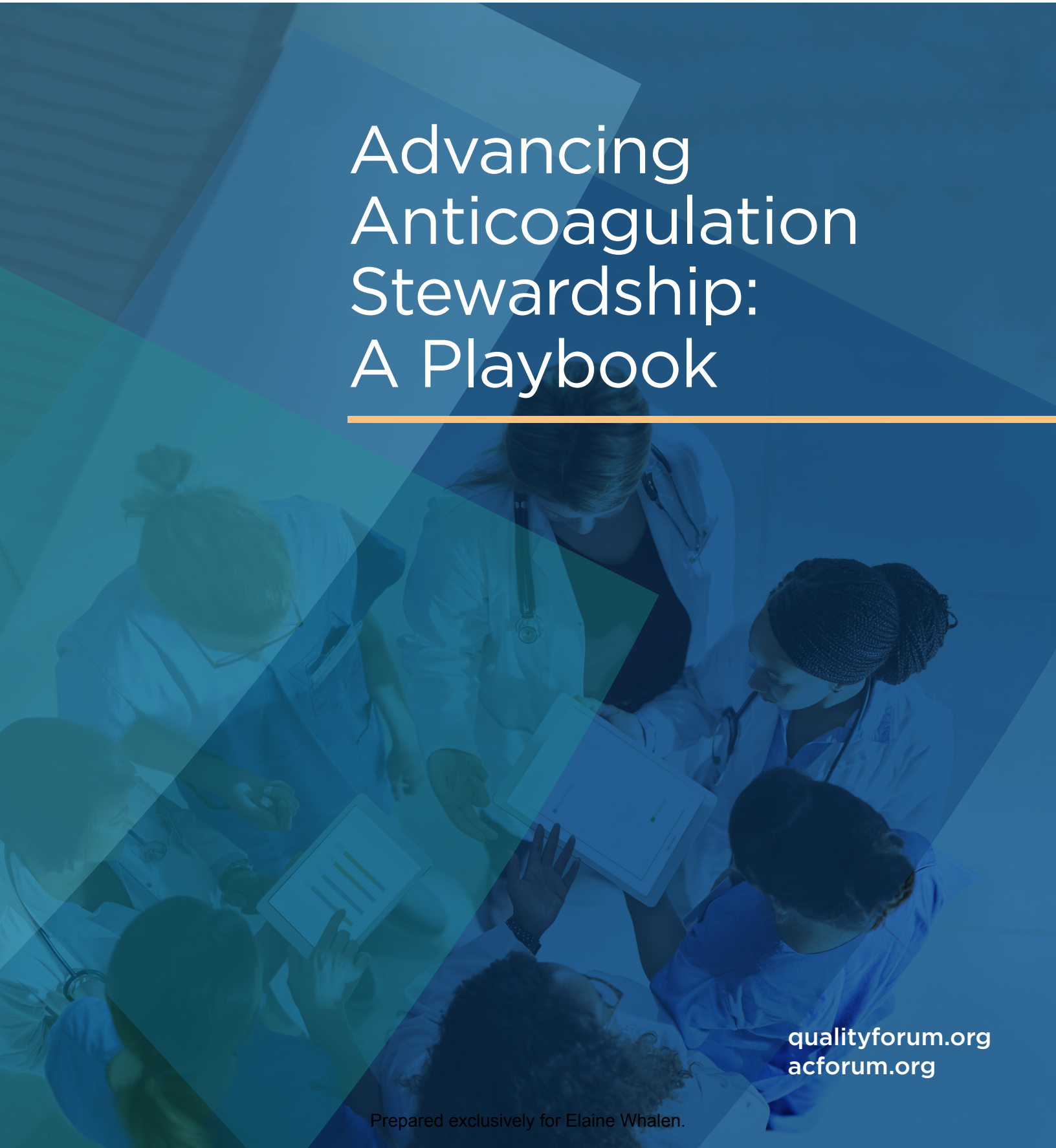
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**Anticoagulation  
FORUM**

# Advancing Anticoagulation Stewardship: A Playbook

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Prepared exclusively for Elaine Whalen.

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## ABOUT THE ANTICOAGULATION FORUM

The Anticoagulation Forum is the largest organization of anticoagulation management specialists dedicated to improving the quality of patient care. The ACF advances Anticoagulation Stewardship by educating healthcare professionals and advocating for clinical best practices. Learn more at [www.acforum.org](http://www.acforum.org)

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## BACKGROUND

# The National Urgency for Safe Anticoagulant Use

**More than 8 million people in the U.S. currently take anticoagulants for medical indications, such as atrial fibrillation (AF), venous thromboembolism (VTE), peripheral artery disease (PAD), or a mechanical heart valve.**<sup>1,2,3</sup> Anticoagulants are life-saving therapies for individuals with cardiac and vascular disorders that work by decreasing the blood's ability to clot.<sup>1</sup> However, selecting and properly managing the appropriate anticoagulant therapy requires clinicians to carefully consider the benefits of therapy in balance with the risks a patient may face.

In recent years, the use of direct oral anticoagulants (DOACs) has surpassed that of warfarin due to their relative improved safety profile, ease of use and convenience, fewer drug and food interactions, and lack of routine coagulation monitoring. However, by 2017, DOACs accounted for 40% of emergency department (ED) visits for oral anticoagulant-related bleeding events.<sup>4</sup> As the use of DOACs continues to rise, there is growing concern that it could lead to an increase in preventable bleeding events and other harms.<sup>4</sup>

**Anticoagulants have been consistently identified as the most common cause of adverse drug events (ADEs) across various healthcare settings (e.g., inpatient, outpatient, and long-term care),<sup>9,10</sup> despite many of these events being preventable.**

Anticoagulant prescribing and management are complex.

Clinicians must weigh each patient's inherent bleeding and thrombotic risks and select the most appropriate agent and dosing regimen for each individual. In addition, they need to continually surveil their anticoagulated patients for changes in clinical status, comorbidities, and drug-drug interactions and modify treatment appropriately. Clinicians are also responsible for managing any interruptions and the resumption of anticoagulants for invasive procedures or bleeding events.<sup>5</sup>

These considerations require thoughtful and methodical therapy decisions that align with evidence-based recommendations and incorporate patient preferences through shared decision-making processes. Yet clinicians in select healthcare settings

may not receive sufficient education<sup>6</sup> and training regarding evidence-based guidelines to support optimal anticoagulation management, which may contribute to ADEs. **A nationally representative sample of hospitalized Medicare beneficiaries identified anticoagulants as comprising one-third of ADEs.**<sup>7</sup> Medication errors that occur in the outpatient setting, such as incorrect administration, missed doses, and lack of clarity or patient misunderstanding of dosing instructions,<sup>8,9</sup> can lead to serious or life-threatening bleeding or thrombosis.<sup>10</sup>

Transitions of care are high-risk junctures for patients and add to the complexity of anticoagulation management. Safe and effective transitions of care require careful coordination between healthcare settings and clinicians across different disciplines. Clinicians must establish timely, accurate, and effective communication of essential information

regarding a patient's anticoagulation needs and care plan. For example, surgeons or interventionists must be aware of a patient's anticoagulant use and coordinate with the patient's care team to minimize the risk of bleeding and thrombosis while also addressing other patient care needs. However, these communication efforts face significant challenges because of organizational and systemic barriers, including the following:

- Insufficient engagement and education for patients and clinicians
- Lack of standardized, evidence-based dosing practices; real-time clinical guidance and decision support tools; and appropriate alert mechanisms

- Limited interoperability—or the exchange of electronic health information from one healthcare setting to another—and access to requisite data elements needed for safe and effective patient management<sup>11</sup>

**Overcoming these numerous challenges requires a multistakeholder, national effort to promote patient safety and reduce ADEs.** Coordinated and focused organizational efforts on Anticoagulant Stewardship offer a path to address and overcome these existing challenges.

## Coordinated National Approaches to Promote Anticoagulation Safety

Various organizations and regulatory bodies have established national action plans, patient safety goals, quality measures, and other coordinated initiatives to improve anticoagulation safety. However, these existing efforts have been limited in reach or have not gained sufficient traction to catalyze a coordinated, national approach. One such effort is the U.S. Department of Health and Human Services' (HHS) [2014 National Action Plan for Adverse Drug Event Prevention](#) which identifies anticoagulants as a major focus area.<sup>12</sup> Additionally, The Joint Commission's [National Patient Safety Goal \(NPSG\) 03.05.01](#) focuses exclusively on reducing the likelihood of patient harm associated with anticoagulant use.<sup>13</sup> Many of the elements of performance within the NPSG align with HHS' national plan, including the use of evidence-based practices for initiation, reversal, and periprocedural management of anticoagulants, as well as the use of safety practices and education.<sup>14</sup>

Other efforts to promote safe and effective practices include the use of anticoagulant-related quality measures, such as structural measures (e.g., clinic organization structure), process measures (e.g., anticoagulation therapy for AF/atrial flutter), and outcome measures (e.g., incidence of potentially preventable VTE).<sup>15</sup> Engaging in quality measurement enhances the ability of healthcare organizations to assess performance, increase accountability, and identify gaps and areas for improvement. However, existing quality measures may be inadequate in capturing all complex aspects of anticoagulation care, and few outcome measures exist.<sup>16</sup> Furthermore, within the U.S., many anticoagulant-related measures are optional and not regularly utilized by a clinician, given the complexity of care and management.<sup>17</sup>

# Anticoagulation Stewardship to Drive Improvement in Quality and Safety

As demonstrated by ongoing national efforts, both recognition and momentum are building toward the need for the safe use of anticoagulants. One successful approach in recent years is the concept of **Anticoagulation Stewardship, which is defined as a coordinated, efficient, and sustainable system-level initiative designed to achieve optimal anticoagulant-related health outcomes and minimize avoidable ADEs.**<sup>1</sup> Anticoagulation Stewardship provides a holistic approach and focuses on continuous quality improvement and addresses patient-, clinician-, and system-level barriers, as well as opportunities for improved patient care. Anticoagulation Stewardship encourages person-centered care and management of anticoagulants by supporting patients in making informed choices that promote their emotional, physical, and mental health. This approach differs from anticoagulation management services, such as anticoagulant clinics, which are often siloed and simply represent one tool used to achieve Anticoagulation Stewardship.

**Anticoagulation Stewardship is associated with a reduction in drug-drug interactions, bleeding events, hospital readmissions, length of stay, and other healthcare expenditures.**<sup>18,19</sup> Select organizations have implemented an Anticoagulation Stewardship program and have reported cost savings of up to \$4 million and up to \$3 million in cost avoidance.<sup>20</sup>

In 2019, the Anticoagulation Forum, in partnership with the FDA as part of the [Safe Use Initiative](#), identified and developed the seven [Core Elements of Anticoagulation Stewardship](#) programs to support the effective implementation of Anticoagulation Stewardship practices across healthcare entities.<sup>1</sup>

The following Core Elements aim to promote safe, high quality patient care by improving the systematic management of anticoagulants within and across healthcare settings<sup>1</sup>:

- 1 Secure administrative leadership commitment:** Dedicating necessary human, financial, and technology resources

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- 2 Establish professional accountability and expertise:** Appointing a single leader responsible for program outcomes, supported by at least one clinician with expertise in anticoagulation management

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- 3 Engage multidisciplinary support:** Involving key specialists and disciplines to obtain perspective from all domains of the care delivery system

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- 4 Perform data collection, tracking, and analysis:** Defining the population, objectively evaluating performance, and guiding decision making

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- 5 Implement systematic care:** Implementing sustainable, efficient, and evidence-based action(s) at the system level to assure the safety and quality of anticoagulation management

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- 6 Facilitate transitions of care:** Creating systems to optimize communication and ensure safe transitions between care settings

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- 7 Advance education, comprehension, and competency:** Assuring that clinicians, patients, and others have the knowledge and skills necessary to optimize outcomes

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The seven Core Elements build upon the experience of anticoagulation programs and inpatient services; published data; and the guidance of professional societies, quality and safety professionals, and other healthcare organizations.<sup>1</sup>

These elements establish and outline a systematic approach for high quality anticoagulation care that goes beyond anticoagulation management and which healthcare entities can use as a resource to drive improvements.



## Using This Playbook

This Playbook centers on the [Anticoagulation Forum's Core Elements of Anticoagulation Stewardship](#) and offers concrete strategies and implementation examples for healthcare organizations and clinicians who wish to create, promote, and sustain an Anticoagulation Stewardship program.

Recognizing that healthcare organizations may be at different stages or have different levels of resources for implementing an Anticoagulation Stewardship program, this Playbook offers options that can be tailored depending on an organization's goals, objectives, patient population, processes, and available resources.

**The strategies are broken down into two phases: “establishing strategies,” which are recommendations to start a program, and “strengthening and sustaining strategies,” which support organizations looking to advance an existing program. In addition, the Playbook identifies solutions to common barriers that may impede the successful implementation of each Core Element.**

A list of curated tools and resources is included to support the execution of each Core Element. The full list of all tools and resources is also available in [Appendix B](#). The final section of the Playbook offers insights into key drivers of change, such as policy, payment, education, accreditation, certification, measurement, and research, that stakeholders can leverage to drive wider implementation of Anticoagulation Stewardship practices.

While this Playbook is intended primarily for the inpatient setting, a broad set of stakeholders, including other healthcare delivery settings, provider organizations, professional organizations, and policy and regulatory bodies, may find value in the Playbook. This Playbook incorporates multistakeholder input from experts, including patients; frontline clinicians; healthcare administrators; payers; and representatives from federal agencies, professional societies, and quality improvement organizations. A full list of key contributors can be found in [Appendix A](#). This Playbook does not replace the guidance that professional societies, associations, and/or other agencies have produced but builds on current efforts to provide practical, action-oriented strategies.

**GENERAL RESOURCES APPLICABLE ACROSS ALL SEVEN CORE ELEMENTS CAN BE FOUND IN [APPENDIX B](#).**

# CORE ELEMENTS

## Core Element 1:

### Secure Administrative Leadership Commitment

**While all Core Elements are critical to success, administrative leadership commitment is foundational to implementing and sustaining an effective Anticoagulation Stewardship program.** Securing administrative leadership commitment involves healthcare executives dedicating the necessary human, financial, and technological resources to promote Anticoagulation Stewardship.<sup>1</sup> Staffing support, pilot testing programs and strategies, and health information technology (IT) initiatives that enhance decision support tools and automation are examples of components that require administrative leadership commitment. **Leaders must promote cultural expectations regarding Anticoagulation Stewardship by consistently framing anticoagulation-related ADEs as a critical patient safety issue and stewardship as a valuable organizational effort.** When administrative leadership commitment exists, Anticoagulation Stewardship programs become possible and sustainable. Leadership commitment creates funding streams, influences larger organizational change, garners multidisciplinary support, and allows for continuous improvement in an ever-changing landscape.





## ESTABLISHING

- **Obtain an executive sponsor** to work collaboratively with executive leadership to overcome barriers and build connections with a broader group of organizational leaders
  - the executive sponsor could or should be the Chief Executive Officer, Chief Medical Officer, Chief Quality Officer, Chief Information Officer, or Chief Financial Officer, among others who have the potential to obtain buy-in
- **Partner with key stakeholders** (e.g., quality, patient safety, and risk management departments and patient advocates) to fortify the need for and value of Anticoagulation Stewardship
- **Build a case for investing** in Anticoagulation Stewardship by:
  - leveraging anticoagulation-related resources and efforts from regulatory and accreditation leaders (e.g., Centers for Medicare & Medicaid Services [CMS] and The Joint Commission)
  - using data and success stories from existing Anticoagulation Stewardship programs at other organizations
  - collecting data from a small-scale Anticoagulation Stewardship pilot
- **Align Anticoagulation Stewardship program efforts with organizational priorities**, such as:
  - reporting quality measures
  - achieving and maintaining an accreditation status
  - improving performance in value-based programs and quality metrics (e.g., readmissions or length of stay)
- **Share actual cases of patient harm** within the organization to raise awareness, create urgency, and gain buy-in by:
  - presenting to a morbidity and mortality committee
  - performing root-cause analyses
  - generating patient safety reports
- **Conduct a current-state assessment** to understand the organization's existing anticoagulation practices and infrastructure and identify gaps in current practice and regulatory requirements and national guidelines

## STRENGTHENING AND SUSTAINING

- **Continue building on administrative buy-in** and Anticoagulation Stewardship program momentum by:
  - analyzing the findings from the pilot initiative to define the resources needed to further program implementation
  - linking pilot initiative results to relevant patient safety indicators to justify and advocate the need for dedicated program employees
- **Generate broader support** from administration, clinicians, diverse service lines, departments, and well-respected leaders across the entire organization by:
  - establishing/expanding a multidisciplinary Anticoagulation Stewardship Committee to help implement the Anticoagulation Stewardship program, overcome barriers, and establish accountability
  - inviting executive leaders to shadow patient care activities so they have firsthand knowledge of existing deficiencies and how Anticoagulation Stewardship can improve patient care
- **Foster a cultural expectation** centered on promotion and adherence to stewardship initiatives by:
  - using the **“three B method”**: a **box** in the organizational chart, a **budget** line in the organization's budget, and a standard **bullet** point agenda item for report outs at administrative meetings (e.g., Board of Directors, [P&T] or Quality Committees) to communicate the progress of the Anticoagulation Stewardship program
  - building on foundational goals to create more challenging objectives over time (e.g., reduced readmissions, costs, and harm events, and increased adherence to protocols and medication)
  - reviewing on a regular basis (e.g., annually) the budget and the resources needed to adequately support the Anticoagulation Stewardship program based on the size and capacity of the organization

## Potential Barriers and Suggested Solutions to Securing Administrative Leadership Commitment

POTENTIAL BARRIERS	SUGGESTED SOLUTIONS
<p><b>Failure to fully engage an extensive range of key stakeholders</b></p>	<ul style="list-style-type: none"> <li>• Develop a strategic plan for creating an Anticoagulation Stewardship program, which includes goals, staff structure, and data reporting tools</li> <li>• Create an Anticoagulation Stewardship program mission statement and charter with clearly defined goals for success</li> <li>• Develop a one-page case statement for an Anticoagulation Stewardship program, emphasizing opportunities to improve quality and reduce costs for leadership to easily review</li> </ul>
<p><b>Limited internal data to make a business case for an Anticoagulation Stewardship program</b></p>	<ul style="list-style-type: none"> <li>• Demonstrate return on investment (ROI) through the execution of smaller Anticoagulation Stewardship pilot initiatives before attempting full organizational implementation (e.g., high-cost, high-risk agents, such as prothrombin complex concentrate [PCC])</li> <li>• Leverage external data (e.g., published literature, guidelines) to develop a narrative about the impact on patient safety, quality, and cost</li> <li>• Use a mix of internal performance data and external resources (e.g., data from other Anticoagulation Stewardship programs) to propose innovative approaches for a scalable and sustainable Anticoagulation Stewardship program</li> <li>• Present the program as a mechanism to support data collection and quality improvement for both existing organizational priorities as well as anticoagulation rather than presenting it as an either/or option</li> </ul>
<p><b>Competing priorities and lack of resource commitment</b></p>	<ul style="list-style-type: none"> <li>• Present a clear vision of what you want to accomplish with the program and start on a small scale, but with a plan for how scalability can occur</li> <li>• Use results of a baseline landscape survey to prioritize resource requests</li> <li>• Identify existing resources and infrastructure that could be extrapolated to Anticoagulation Stewardship efforts (e.g., antimicrobial data queries)</li> <li>• Leverage innovative funding opportunities (e.g., through federal offices, grants, or payers) to obtain support from senior leaders to implement Anticoagulation Stewardship programs</li> </ul>

## Tools and Resources

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### General

- [Core Elements of Anticoagulation Stewardship Programs Guide - Anticoagulation Forum](#)
- [Directive 1108.16\(1\), Anticoagulation Therapy Management – Department of Veterans Affairs, Veterans Health Administration](#)
- [National Action Plan for Adverse Drug Event Prevention: Anticoagulants – HHS](#)
- [National Patient Safety Goal \(NPSG\) 03.05.01 – The Joint Commission](#)

### Advocacy Resources

- [Administrative Oversight Gap Analysis: Hospitals and Skilled Nursing Facilities – Anticoagulation Forum](#)
- [Anticoagulation Stewardship: A National Movement – Anticoagulation Forum](#)
- [Anticoagulation Stewardship: Evidence of Impact – Anticoagulation Forum](#)
- [Anticoagulation Stewardship: Profiles in Progress - Anticoagulation Forum](#)
- [US Emergency Department Visits Attributed to Medication Harms, 2017-2019 – Journal Article](#)

### Assessing Current Programs

- [Checklist for Core Elements of Anticoagulation Stewardship Programs – Anticoagulation Forum](#)
- [Medication Safety Self Assessment for Antithrombotic Therapy – Institute for Safe Medication Practices](#)
- [Return on Investment Tool – Agency for Healthcare Research and Quality \(AHRQ\)](#)

### Learning From Other Stewardship Initiatives

- [Antibiotic Stewardship Core Element 1: Leadership Commitment – Health Quality Innovation Network \(HQIN\)](#)
- [Antimicrobial Stewardship Gap Analysis Tool – Minnesota Department of Health](#)
- [How to Pitch an Antibiotic Stewardship Program to the Hospital C-Suite – Journal Article](#)

## Core Element 2:

### Establish Professional Accountability and Expertise

**Establishing an Anticoagulation Stewardship program requires personnel who can uphold accountability and provide expertise to develop, implement, and evaluate stewardship activities day to day.**<sup>21</sup> To create accountability, healthcare organizations must appoint a single program leader who performs routine oversight activities, establishes fiscally and operationally efficient protocols and practices, and is responsible for program outcomes.<sup>1</sup> Just as importantly, the program leader should work collaboratively with the executive sponsor who can help garner support and advocate for the Anticoagulation Stewardship program's strategic aims and processes. Program leaders should be accountable for consistently interpreting performance data, communicating results with program staff and leadership, identifying areas for improvement, and growing their stewardship expertise through ongoing education and advanced training. **When adequately supported by executive leadership, program leaders can help escalate concerns, align roles and responsibilities, and create synergies with larger organizational efforts.** Once accountability and expertise exist, Anticoagulation Stewardship programs can better achieve the organization's mission, engage all key stakeholders, perform quality improvement activities, and promote the safe use of anticoagulants.



## ESTABLISHING

- **Identify a program leader** whose principal role is to design, develop, and lead an Anticoagulation Stewardship program and address day-to-day problems (e.g., staffing questions, expertise) by:
  - preparing a job description to describe expectations of the role
  - aligning Anticoagulation Stewardship program duties with their own professional goals (e.g., publishing manuscripts, formal recognition of leadership role)
  - offering a dedicated salary support and protected time to incentivize engagement
- **Identify a clinician subject-matter expert (SME) who could support the program leader if needed**
  - the SME should be a capable anticoagulation management expert who can identify ideas and strategies to shape and sustain the program
- **Create a reporting structure** that creates clear roles, facilitates open communication, and promotes accountability and support at all levels (e.g., hospital administration, pharmacy, and clinical departments)
- **Create clear alignment and agreement on measurable goals** that demonstrate the success of the Anticoagulation Stewardship program and that are regularly reviewed and modified as needed, such as:
  - increasing medication adherence
  - increasing comfort in a patient's self-management prior to leaving the hospital and at home
  - lowering inpatient ADE rate
  - lowering ED visits and readmissions due to anticoagulant use

## STRENGTHENING AND SUSTAINING

- **Create requirements for ongoing Anticoagulation Stewardship education and competencies** within the organization by:
  - providing protected time for staff to participate in educational events
  - establishing accountability through required competencies
  - creating a central library to access information and educational resources
- **Confirm that the program leader continuously has time and resources** to ensure sustainability of the program as it grows and changes over time
- **Obtain recognition as a [Center of Excellence](#)** to ensure clinicians are informed of and practicing the safest anticoagulation practices
- **Establish a multidisciplinary Anticoagulation Stewardship Committee** to accomplish the following:
  - meet routinely to discuss program implementation, identify and overcome barriers, and establish accountability
  - create a project charter that identifies the mission, vision, goals, scope, and responsibilities of stakeholders
  - share data with program staff, administrative leadership, and clinical departments to identify areas of continued improvement
- **Evaluate and routinely share the organization's progress across anticoagulation-related metrics** with all employees and highlight areas for improvement (e.g., failure in communication, missing data elements, and patients who did not receive follow-up care)



## Potential Barriers and Suggested Solutions to Establishing Professional Accountability and Expertise

POTENTIAL BARRIERS	SUGGESTED SOLUTIONS
<p><b>Limited time or access to resources to practice Anticoagulation Stewardship</b></p>	<ul style="list-style-type: none"> <li>• Create clear roles with defined term lengths and thoughtfully divide responsibilities for Anticoagulation Stewardship program staff to set expectations, reduce burnout, and encourage higher engagement                             <ul style="list-style-type: none"> <li>- gather information on existing job roles, functions, and expertise to better understand how to leverage existing expertise and support</li> </ul> </li> <li>• Leverage existing data resources to obtain quality information (e.g., patient safety data)</li> </ul>
<p><b>Lack of targets and evaluation metrics to effectively assess the program or patient care improvement</b></p>	<ul style="list-style-type: none"> <li>• Use evidence-based guidelines to help identify areas for improvement and set Anticoagulation Stewardship goals</li> <li>• Conduct continuous process improvement rather than setting stagnant targets</li> <li>• Leverage an existing patient safety committee to identify potential changes or information needed to improve Anticoagulation Stewardship</li> <li>• Identify metrics that are most valuable for informing future funding decisions made by executive leadership</li> </ul>
<p><b>Individuals helping to start the Anticoagulation Stewardship have limited expertise</b></p>	<ul style="list-style-type: none"> <li>• Leverage support from the identified Anticoagulation Stewardship SME and executive sponsor during the startup process</li> <li>• Select a leader with anticoagulation management experience and who is dynamic, engaged, and agile in implementing and testing new strategies</li> <li>• Identify additional mentors—outside of the SME—to support the program leader as needed</li> <li>• Leverage and engage residents or fellows with anticoagulation projects to cultivate them for future leadership roles</li> <li>• Offer training for interested individuals through continuing education credits or reimbursement</li> </ul>

## Tools and Resources

### General

- [Anticoagulation Provider Toolkit – Michigan Anticoagulation Quality Improvement Initiative \(MAQI<sup>2</sup>\)](#)
- [Miscellaneous Anticoagulant Resources – American Society of Hematology](#)

### Certification

- [Anticoagulation Board Certification: Certified Anticoagulation Care Provider \(CACP\) – NCBAP](#)
- [Anticoagulation Certificate – American Society of Health-System Pharmacists](#)
- [Anticoagulation Therapy Management Program – University of Southern Indiana College of Nursing and Health Professions](#)
- [Anticoagulation Therapy Management for Pharmacists – University of Florida College of Pharmacy](#)
- [Anticoagulation Centers of Excellence: Becoming a Center of Excellence – Anticoagulation Forum](#)

### Clinical Guidelines

- [American College of Cardiology Library of Guidelines and Clinical Documents](#)
- [American College of Chest Physicians \(CHEST\) Pulmonary Vascular: Guidelines and Consensus Statements](#)
- [American Society of Hematology 2018 Guidelines for Management of Venous Thromboembolism: Optimal Management of Anticoagulation Therapy – American Society of Hematology](#)

### Guidance From Existing Programs

- [Anticoagulation Program – University of Wisconsin](#)
- [Anticoagulation Resources for Healthcare Professionals – University of California, Davis](#)
- [Anticoagulation Services – University of Washington Medicine Washington](#)

### Learning From Other Stewardship Initiatives

- [Antibiotic Stewardship Core Element 2: Accountability – HQIN](#)
- [Guidance for the Knowledge and Skills Required for Antimicrobial Stewardship Leaders – Journal Article](#)
- [Toolkit to Implement, Monitor, and Sustain an Antimicrobial Stewardship Program: Nursing Home – ARHQ](#)

## Core Element 3: Engage Multidisciplinary Support

**Anticoagulation Stewardship requires the input of diverse specialists and disciplines to ensure all aspects of a patient’s care journey, including intake, discharge, and community handoffs, are considered in the program’s development and implementation.**<sup>21</sup> Program leaders seeking multidisciplinary support should engage a wide-range of clinical (e.g., medical, surgical, nursing, pharmacy, nutrition services, and laboratory) and nonclinical (e.g., risk management, patient safety, quality, data analytics, and IT) departments, patient representatives, and others.

**Engaging a range of staff, departments, and expertise in Anticoagulation Stewardship programs can prevent deficiencies in clinical management, communication, drug administration, and/or patient adherence that contribute to patient harm.** Program leaders should establish multidisciplinary engagement during the planning and pre-implementation period of the Anticoagulation Stewardship program to help increase the program’s overall effectiveness and success. When all key stakeholders are engaged and involved, organizations can enhance program effectiveness and increase the quality of anticoagulation care.



## ESTABLISHING

- **Raise awareness of the Anticoagulation Stewardship efforts** and garner visibility and multidisciplinary support by:
  - identifying an Anticoagulation Stewardship program representative to participate on the P&T committee
  - sharing real patient stories and program success stories of multidisciplinary collaboration through organization-wide communication channels (e.g., emails, newsletters, and webpages)
  - identifying representatives from various regions to support broader stakeholder buy-in at larger health systems that span geographic areas
- **Ensure the success of program uptake and implementation** by:
  - developing a tool kit that outlines common communication standards,<sup>22</sup> anticoagulant risks and suggested best practices, and examples of success involving multidisciplinary teams
  - establishing a small workgroup composed of multidisciplinary representatives (e.g., physician, nurse, and pharmacist) to pilot specific improvement strategies for anticoagulation management
- **Set anticoagulation-related process goals** that require cross-departmental collaboration to unite multidisciplinary teams on a common goal, such as:
  - reducing off-label anticoagulant use
  - reducing inappropriate bridging
  - improving VTE prophylaxis

## STRENGTHENING AND SUSTAINING

- **Incorporate regular Anticoagulation Stewardship informational presentations at diverse departmental meetings**, such as P&T, medical specialties, leadership, and other medical specialties meetings
- **Develop an Anticoagulation Stewardship Committee** with multidisciplinary representation, including the following:
  - members from various clinical departments (e.g., internal medicine, family medicine, cardiology, neurology, critical care, hematology, vascular surgery, nursing, emergency medicine, coagulation laboratory, and others)
  - frontline clinicians who can provide insight into practical applications and challenges
  - individuals who are not directly involved in care delivery but play an essential role in advancing the Anticoagulation Stewardship program (e.g., front desk staff, patient safety and regulatory representatives, and IT staff)
- **Launch an anticoagulation shadowing/mentoring program** for residents and students enrolled in various clinical programs (e.g., pharmacy, medicine) to learn more about caring for patients on anticoagulants<sup>23</sup>

## Potential Barriers and Suggested Solutions to Engaging Multidisciplinary Support

POTENTIAL BARRIERS	SUGGESTED SOLUTIONS
<p><b>Hesitancy from frontline staff to participate in stewardship initiatives due to concerns about limited staff availability and increased workload</b></p>	<ul style="list-style-type: none"> <li>• Communicate to department heads the institutional priorities of the organization with support from the administration</li> <li>• Obtain multistakeholder buy-in by:                             <ul style="list-style-type: none"> <li>- developing a five-minute pitch to articulate the value of Anticoagulation Stewardship quickly and clearly to frontline staff</li> <li>- leveraging an SME among frontline staff with a passion to improve Anticoagulation Stewardship</li> <li>- reinforcing the importance of national calls to action to bring staff together in support of common goals</li> </ul> </li> <li>• Secure time for staff to easily engage and participate in stewardship trainings and meetings (e.g., keep meetings short, hold trainings at convenient times, and offer meals during training opportunities)</li> <li>• Consider who needs to be a standing member versus an ad hoc member in the committee or workgroup</li> <li>• Utilize recorded or on-demand training materials</li> <li>• Organize continuing education trainings and networking opportunities to help staff understand the effects of implementing best practices and quality improvement activities</li> </ul>
<p><b>Lack of financial and human resources to support multidisciplinary engagement</b></p>	<ul style="list-style-type: none"> <li>• Share instances in which multidisciplinary engagement led to improved patient safety, and use data to connect those efforts to broader, organizational goals and cost savings (e.g., reduced ADEs, reduced readmissions, and pharmacy-related cost savings)</li> <li>• Prioritize the largest areas of concern and leverage tools such as dashboards to work through one problem at a time</li> <li>• Alleviate responsibilities and time requirements by rotating team member roles depending on which specific implementation efforts are taking place</li> </ul>
<p><b>Lack of buy-in, participation, and engagement from certain stakeholders and disciplines</b></p>	<ul style="list-style-type: none"> <li>• Share institution-specific and department-specific data to emphasize the problem and solutions within clinical areas</li> <li>• Recognize a one-size-fits-all approach may not work, and certain stakeholders might need to hear about problems and opportunities for improvement specifically related to their discipline and/or department</li> <li>• Promote a culture of accountability and set expectations that adherence to systematic processes will be evaluated and reported</li> <li>• Identify a patient representative(s) known to the organization or via a patient advocacy organization to share real-world impact stories related to anticoagulants</li> </ul>



## Tools and Resources

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### General

- [Antithrombotic Stewardship: A Multidisciplinary Team Approach Towards Improving Antithrombotic Therapy Outcomes During and After Hospitalization: A Study Protocol - Journal Article](#)
- [Development of Multidisciplinary Anticoagulation Management Guidelines for Patients Receiving Durable Mechanical Circulatory Support - Journal Article](#)
- [How to Guide: Multidisciplinary Rounds - Institute for Healthcare Improvement\\*](#)
- [Reducing Error in Anticoagulant Dosing via Multidisciplinary Team Rounding at Point of Care - Journal Article](#)

### Making a Case

- [Effect of Antithrombotic Stewardship on the Efficacy and Safety of Antithrombotic Therapy During and After Hospitalization: A Study Protocol - Journal Article](#)
- [The Effect of Hospital-Based Antithrombotic Stewardship on Adherence to Anticoagulant Guidelines - Journal Article](#)

### Building a Culture of Safety

- [Survey on Patient Safety Culture™ \(SOPS®\) - AHRQ](#)

\*Source is free; however, an Institute for Healthcare Improvement (IHI) account is needed to access the full guide.

## Core Element 4: Perform Data Collection, Tracking, and Analysis

**Data collection, tracking, and analysis are vital to creating a successful Anticoagulation Stewardship program.**<sup>1</sup> Healthcare organizations should adequately define the population being treated, objectively evaluate performance through measurement, and use data and evidence-based guidelines to drive decision making. **Programs should allocate resources and infrastructure to support IT experts and data analysts in establishing analytical methods and interpreting results for their program and patient population.** With proper funding, organizations can implement quality improvement strategies, such as creating anticoagulant-related data collection tools and developing informative and illustrative performance reports and dashboards to support decision making. When strong anticoagulation-related data collection and analysis processes exist, organizations can evaluate gaps in the performance of anticoagulant care practices, identify priorities for action, act on the improvement areas, and advocate for additional resources.



## ESTABLISHING

- **Engage IT department early** in the Anticoagulation Stewardship program implementation to accomplish the following by:
  - helping program staff understand how to leverage current safety or quality report infrastructure capabilities, data elements/metrics already being collected, and the organization’s capability to create an Anticoagulation Stewardship dashboard
  - developing expertise in Anticoagulation Stewardship reporting requirements
- **Identify quality improvement opportunities with performance benchmarks** to reduce the burden for staff, such as:
  - using best practices for documentation (e.g., smart buttons, flow sheets) to aid and streamline data collection and reporting
  - using data that reflect what is important in your organization—knowing that priorities can change as progress occurs—and allowing goals to evolve over time
  - using existing database programs to help with data collection if IT investment is not feasible, or an organization has limited resources
  - ensuring data collection occurs in a timely manner to inform patient care decisions
  - developing safety nets and redundancies within the EHR to avoid missed patients, lost follow-ups, or missing labs
- **Establish a clear understanding of data elements and quality measures needed** by:
  - ensuring identified data points are targeted to the population or condition (e.g., renal failure) and are succinct (e.g., do not require the entry of unnecessary data elements)
  - identifying which anticoagulation-related structural, process, and/or outcome measures the organization should use to monitor progress

## STRENGTHENING AND SUSTAINING

- **Promote better data management** by:
  - establishing clear roles and responsibilities for analyzing and sharing data reports
  - training clinicians and other staff to run queries and reports using existing EHR capabilities to reduce reliance on data analysts
  - developing education sessions on the high-priority anticoagulation-related metrics for the organization and on how to collect data and analyze the results
- **Create a measure set** to capture the full quality and “story” of the Anticoagulation Stewardship program, and ensure measures are:
  - specific (with a well-defined numerator, denominator, and inclusion/exclusion criteria)
  - relevant (to capture and address an issue or problem the organization is trying to fix)
  - timely (so that the data are collected in a reasonable time to make changes)
  - actionable (so that the data and results can be acted upon)
  - understandable (with staff receiving appropriate training on how to interpret the measures)
- **Establish S.M.A.R.T goals [Specific-Measurable-Achievable-Relevant-Time-Bound]** based on quality measures and anticoagulation-related measure sets
- **Facilitate data collection and data analysis efforts** by:
  - creating a universal form with a core set of questions and processes to be addressed during a patient visit to standardize data collection processes across settings and EHR system
  - creating reports that provide meaningful and actionable information that can be easily understood and acted upon by different stakeholders (e.g., clinicians, reporting agencies, and payers)
  - establishing automatic data collection processes that are easy to use and efficient (e.g., create a data dashboard)
  - deploying supplemental electronic surveillance programs (e.g., programs that communicate with the existing EHR to help identify patients on anticoagulants)

## Potential Barriers and Suggested Solutions to Performing Data Collection, Tracking, and Analysis

POTENTIAL BARRIERS	SUGGESTED SOLUTIONS
<p><b>Insufficient resources for data collection</b></p>	<ul style="list-style-type: none"> <li>• Utilize data reports that are already available in the EHR (e.g., existing reports built by other organizations)</li> <li>• Leverage regular workflow documentation, or, if not available, automate a standardized data collection form that can be adapted based on organizational priorities and changing resources</li> <li>• Tie investment for data infrastructure to broader organization priorities (e.g., accreditation, reimbursement)</li> </ul>
<p><b>Poor data quality (e.g., limited availability and/or integrity)</b></p>	<ul style="list-style-type: none"> <li>• Recognize that spending time planning for data collection can ease burden, reduce errors, and create sustainability in the long-term</li> <li>• Identify opportunities to use metrics and quality improvement analysis to make processes easier and more standardized</li> <li>• Use common quality-of-care scenarios (e.g., DOACs and renal failure) to identify what data points should be collected</li> <li>• Utilize NQF-endorsed measures or other quality measures that have a well-defined numerator, denominator, and strong validation</li> <li>• Partner with EHR vendors to establish discrete data elements for reporting</li> </ul>
<p><b>Limited knowledge, expertise, and understanding of key anticoagulation-related data elements and reporting structures</b></p>	<ul style="list-style-type: none"> <li>• Create educational opportunities to establish a baseline knowledge on Anticoagulation Stewardship, how to collect and report key data elements and metrics, and the desired outcomes and goals of the program</li> <li>• Build Anticoagulation Stewardship training into residency programs and staff education workshops for clinicians who manage patients on anticoagulants</li> </ul>

## Tools and Resources

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### Data Collection

- [Assessment of ICD-10-CM Code Assignment Validity for Case Finding of Outpatient Anticoagulant-Related Bleeding Among Medicare Beneficiaries - Journal Article](#)
- [Implementation of the Management of Anticoagulation in the Periprocedural Period App Into an Electronic Health Record: A Prospective Cohort Study - Journal Article](#)
- [Improving Anticoagulation Measurement - Journal Article](#)

### Generating Reports

- [Implementation of a Fast Healthcare Interoperability Resources \(FHIR\)-Based Clinical Decision Support Tool for Calculating CHA2DS2-VASc Scores - Journal Article](#)
- [Instructions to Develop a Dashboard - Centers for Medicare & Medicaid Services \(CMS\)](#)
- [Patient Safety Organization \(PSO\) Program - Agency for Healthcare Research Quality \(AHRQ\)](#)

### Measurement

- [Global Trigger Tool for Measuring Adverse Events - Institute for Healthcare Improvement](#)
- [Examples of a Health Care Failure Mode and Effects Analysis for Anticoagulants](#)
- [Quality Payment Program - Centers for Medicare & Medicaid Services](#)
- [Quality Positioning System - National Quality Forum](#)
- [QualityNet - Centers for Medicare & Medicaid Services](#)



## Core Element 5: Implement Systematic Care

**Systematic care requires setting sustainable, efficient, and evidence-based actions at the system level to ensure the safety and quality of anticoagulation management practices.<sup>1</sup>**

The hallmarks of systematic anticoagulant care include an emphasis on evidence-based anticoagulant practices, person-centeredness, and integrated processes and clinical workflows for prescribing, dispensing, and managing anticoagulants. Anticoagulation Stewardship programs should create anticoagulation-related policies, procedures, and order sets; establish clinical, decision-making support and risk assessment tools; and promote setting-specific protocols and guidelines for initiating and maintaining anticoagulation therapy that are fiscally and operationally efficient.<sup>1</sup> **Implementation of systematic Anticoagulation Stewardship can lead to better evidence-based care, increased multidisciplinary engagement, and real-time feedback and quality improvement activities.<sup>21, 24</sup>**



## ESTABLISHING

- **Train, empower, and build staff expertise** so that they can promote Anticoagulation Stewardship and adherence to clinical guidelines by:
  - placing guidelines and policies in an easily accessible location (e.g., staff intranet, anticoagulation-specific webpage)
  - educating staff on the limitations of guidelines and protocols and how to individualize anticoagulation therapy when necessary
  - developing a standardized protocol for frontline clinicians to triage patients for initiation of or switch to DOAC
- **Implement standardized protocols and population-based management tools** for common anticoagulant-related clinical situations, including but not limited to the following:
  - reversal and resumption of procedures or bleeding events
  - switching between anticoagulants
  - outpatient and inpatient management of VTE
  - transitions of care<sup>6</sup>
- **Create a digital dashboard** and identify and display relevant data elements to inform care decisions and drive real-time quality improvement opportunities, such as:
  - incorrect dose and suboptimal regimen for indication
  - contraindications and complications from anticoagulants
  - response to laboratory values (e.g., serum creatinine) and patient time in therapeutic range (TTR)<sup>25</sup>
- **Meet with the EHR vendor** to ensure the organization is aware of all functionality and is using the tools that are already available in the EHR (e.g., clinical decision support tools that exist within the EHR)
- **Gain strategic insights** by partnering with quality improvement organizations or other organizations that have advanced Anticoagulation Stewardship programs

## STRENGTHENING AND SUSTAINING

- **Evaluate current processes** and adjust as needed to meet guidelines by:
  - formalizing preventative policies and processes that reduce ADEs and promote knowledge sharing in early pilot initiatives or at the program's inception
  - integrating evidence-based processes from anticoagulation guidelines into the EHR to promote guidelines and policy adherence
- **Optimize clinical decisional support** within the EHR by:
  - promoting appropriate real-time decisions related to the use of anticoagulant therapies
  - incentivizing collaboration between vendors, app developers, and other technology resources for clinical decision support
  - creating electronic tools, such as templated orders, alerts, and/or links to institutional guidance documents, to aid in operationalizing care (e.g., institute flags or alerts in the EHR to indicate when patients are on anticoagulants)<sup>6</sup>
- **Collaborate and leverage use of pharmacy department** by:
  - implementing pharmacy-driven automatic actions (e.g., DOAC dosing adjustments) to prevent errors
  - ensuring anticoagulants are on high-risk medication lists to indicate the need for additional care when administered
  - creating a system in which an anticoagulation expert or pharmacist reviews each patient's anticoagulant prescription to ensure alignment with current guidelines
  - using a pharmacy barcode scanning system to ensure correct dosage and proper anticoagulant selection<sup>6</sup>

## Potential Barriers and Suggested Solutions to Implementing Systematic Care

POTENTIAL BARRIERS	SUGGESTED SOLUTIONS
<p><b>Inadequate support from leadership, administration, and/or department chairs</b></p>	<ul style="list-style-type: none"> <li>• Link systematic care for Anticoagulation Stewardship to priorities and care practices of which leadership is already aware (e.g., antibiotic stewardship)</li> <li>• Inform administrative leadership about how systematic care can support better patient outcomes and prevent ADEs (e.g., reduce risk and complications from thromboembolisms)<sup>26</sup></li> <li>• Encourage executive leadership, executive sponsors, and subject matter experts to express their support to Anticoagulation Stewardship Committee members and staff</li> </ul>
<p><b>Inability to create policies and update guidelines in real time</b></p>	<ul style="list-style-type: none"> <li>• Use resources from other organizations and state agencies to help spread and scale learnings</li> <li>• Recruit fellows, residents, and/or interns to assist with the development and maintenance of stewardship tools and resources</li> <li>• Leverage relationship with the pharmacy department to keep track of updated medication guidelines and formulary changes</li> <li>• Develop a mechanism to track when specific tools are due for regular review and updating based on literature and recognized best practices</li> </ul>
<p><b>Limited IT infrastructure to support systematic care</b></p>	<ul style="list-style-type: none"> <li>• Hold informal group sessions to discuss challenges with the EHR infrastructure and share solutions</li> <li>• Build relationships with external organizations who use the same EHR to identify whether they have built-in tools to support systematic care that can be easily implemented at your institution</li> </ul>

## Tools and Resources

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### General

- [Resources Center – Anticoagulation Forum](#)
- [Anticoagulation Forum Rapid Resources – Anticoagulation Forum](#)
- [Web and Mobile Apps – American College of Cardiology](#)

### Implementation

- [Anticoagulation Therapy: Understanding the Requirements – The Joint Commission](#)
- [Quality Enhancement Research Initiative \(QUERI\) – U.S. Department of Veterans Affairs](#)
- [The Development of Evidence-Based Care Recommendations to Improve the Safe Use of Anticoagulants in Children – Journal Article](#)

### Quality Improvement

- [Improving Patient Outcomes – Michigan Anticoagulation Quality Improvement Initiative \(MAQI<sup>2</sup>\)](#)
- [Order Sets – Anticoagulation Forum](#)
- [Improving the Safe Use of Direct Oral Anticoagulants for Veterans: Direct Oral Anticoagulants \(DOAC\) Dashboard – U.S. Department of Veterans Affairs](#)

### Examples

- [Inpatient Antithrombotic Management Procedures – University of New Mexico Hospitals](#)
- [Clinical Guideline and Practice Protocol – Atrius Health Anticoagulation Management Service](#)
- [Applying Population Health Approaches to Improve Safe Anticoagulant Use in the Outpatient Setting: The DOAC Dashboard Multi-Cohort Implementation Evaluation Study Protocol – Journal Article](#)
- [Working Smarter, Not Harder: Evaluating a Population Health Approach to Anticoagulation Therapy Management – Journal Article](#)
- [Strategies for Venous Thromboembolism Prevention – John Hopkins Medicine](#)



## Core Element 6: Facilitate Transitions of Care

**Transitions of care occur any time a patient moves between care settings, clinical teams, or on/off medications.**<sup>27</sup> Effective care transitions are critical in ensuring patients on anticoagulants receive appropriate, high quality, and timely care. To facilitate effective anticoagulation-related care transitions, organizations should evaluate their ability to provide clear and timely communication about anticoagulants, ADEs, and other anticoagulation-related risks. **Poor transitions of care render all patients, particularly those on anticoagulants, vulnerable to miscommunications; gaps in clinical management; and potentially serious ADEs, including hemorrhage, stroke, and VTE.**<sup>28</sup> Organizations with successful transitions of care are able to support ongoing communication between clinicians, establish clear channels for patient-provider communication, and promote continuous use of recommended therapies.



## ESTABLISHING

- **Clearly define common transitions of care** for patients on anticoagulants to promote adequate staff communication during critical transition points, such as:
  - periprocedural care activities
  - interfacility and within-facility transfers
  - clinician changes
  - new/removed diagnoses
  - new/removed medications
  - change of insurance
  - reversal and resumption of anticoagulants
  - device-related anticoagulant use (e.g., patients on mechanical circulatory support devices)
- **Establish specific, clearly defined, and mutually understood roles** and responsibilities, for clinicians such as identifying who:
  - provides patient education for pre-discharge interventions
  - conducts follow-up and post-discharge interventions
  - can be contacted by the patient and their caregivers with questions
- **Identify specific steps that each care team member can take** during the transition (e.g., medication reconciliation)
- **Employ technology to increase communication** between clinicians (e.g., teleconferencing, virtual collaboration)

## STRENGTHENING AND SUSTAINING

- **Develop, and frequently update, transitions of care policies, protocols, and checklists**
- **Create a note template within the existing EHR** to promote successful care transitions for patients on anticoagulants and obtain feedback to ensure value to end users prior to full implementation
- **Use health information exchanges (HIEs)** to view patient information from other facilities and to make informed anticoagulant-related care decisions
- **Host periodic workshops for community partners and external healthcare facility staff** (e.g., nursing facilities, rehabilitation facilities) to promote awareness and standardization of care transition processes and communication<sup>1</sup>
- **Adjust care pathways** to encourage staff to consult the anticoagulation clinic or specialist early and often for the following:
  - drug selection, dosing, and medication adherence throughout the patient's course of treatment
  - standardization of periprocedural use of anticoagulants
- **Create collaborative practice agreements** between outpatient pharmacists and clinicians to allow privileged pharmacists to initiate, discontinue, or adjust antithrombotic therapies, and order laboratory tests



## Potential Barriers and Suggested Solutions to Facilitating Transitions of Care

POTENTIAL BARRIERS	SUGGESTED SOLUTIONS
<p><b>Lack of anticoagulation communication and protocols during transition processes</b></p>	<ul style="list-style-type: none"> <li>• Establish a single point of contact for each patient to increase closed-loop communication</li> <li>• Develop clear transition protocols that require handoffs and direct conversations to convey clinical information</li> <li>• Build dedicated time into provider schedules to accomplish the following:                             <ul style="list-style-type: none"> <li>- have meaningful conversations with new and existing patients about their medical history, unique risk factors, and recent changes in care</li> <li>- facilitate warm handoffs and transitions to other clinicians and settings</li> </ul> </li> </ul>
<p><b>Lack of interoperability between and within health systems</b></p>	<ul style="list-style-type: none"> <li>• Leverage the use of trainees (e.g., interns or residents) to pilot and test new communication approaches and inform fully resourced processes</li> <li>• Promote the use of EHR agnostic tools that can enhance interoperability within the healthcare system (e.g., retrieving records from other clinicians and past encounters)</li> </ul>
<p><b>Overreliance on patients to create better transitions</b></p>	<ul style="list-style-type: none"> <li>• Encourage clinicians to define success according to patient expectations and to proactively ask patients about barriers that impede their ability to follow up with care and treatment plans</li> <li>• Map out care transition trajectories for prevalent procedures and conditions and utilize checklists to assure that clinicians and staff anticipate and proactively address key patient needs</li> <li>• Use EHR data to identify patients who do not follow care plans, and identify designated staff members to engage with patients on anticoagulants who do not present for follow-up appointments</li> <li>• Increase provider awareness of available resources to address cultural and social determinants of health (SDOH)-related factors that may contribute to patients not presenting for follow-up appointments and/or not adhering to long-term anticoagulant treatment plans</li> </ul>

## Tools and Resources

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### Examples

- [Project RED \(Re-Engineered Discharge\) - Boston Medical Center](#)
- [Peri-Procedure Management of Anticoagulants - The University of Texas MD Anderson Cancer Center](#)

### Effective Discharge

- [Defining Minimum Necessary Anticoagulation-Related Communication at Discharge: Consensus of the Care Transitions Task Force of the New York State Anticoagulation Coalition - Joint Commission](#)
- [Transitions of Care for Patients with Venous Thromboembolism - Endovascular Today](#)
- [Facilitating Anticoagulation for Safer Transitions: Preliminary Outcomes from an Emergency Department Deep Vein Thrombosis Discharge Program - Journal Article](#)
- [Anticoagulation Discharge Communication \(AC-DC\) Audit Tool - IPRO](#)

### Safer Transitions

- [Anticoagulation Essential Communication Elements for Transitions of Care Guide - Quality Innovation Network - Quality Improvement Organizations \(IPRO QIN-QIO\)](#)
- [Guidance for the Practical Management of Warfarin Therapy in the Treatment of Venous Thromboembolism - Journal Article](#)
- [SBAR Tool: Situation Background Assessment Recommendation - Institute for Healthcare Improvement](#)
- [Anticoagulation: Updated Guidelines for Outpatient Management - Journal Article](#)

## Core Element 7:

### Advance Education, Comprehension, and Competency

**To optimize outcomes and promote patient safety, healthcare organizations must ensure clinicians, patients, and all relevant stakeholders have the knowledge and skills necessary to adhere to evidence-based guidelines and anticoagulation best practices.**<sup>21</sup> Achieving maximum comprehension and competency requires that educational materials be available in various formats (e.g., visual, audio, and written) that are easily accessible and adjustable to the schedules of clinicians. Furthermore, patient educational materials should be visually appealing and tailored to different reading levels and languages. Continuous educational advancement should be repeated at scheduled intervals and be meaningful and measurable. **Anticoagulation Stewardship programs should consistently evaluate their educational materials and approaches to assess for quality improvement opportunities, success stories, and usability for patients.** When organizations take the time to train their workforce and provide meaningful education to their patients, ADEs are lowered<sup>29</sup> and program effectiveness increases.



## ESTABLISHING

- **Identify and implement person-centered educational approaches** that incorporate unique patient factors
- **Develop comprehensive, accessible, and meaningful educational materials** that address the perspectives and roles of various clinical stakeholders by:
  - sharing educational materials and relevant guidelines in a universal location (e.g., staff intranet site)
  - using staff surveys to gauge the usefulness of educational materials and programs
  - implementing skill and knowledge-based anticoagulant training for staff that includes sensitivity to health literacy and non-English speaking populations
- **Broaden patient educational materials and patient role** by:
  - using various education formats, including workshops, online training curriculums, patient forums, or real-time consultations
  - providing patient education materials in multiple languages
- making education materials readily accessible (e.g., via a patient portal, which patients can access and know how to use)
- creating a position for a patient representative on the Anticoagulation Stewardship Committee
- **Establish requirements and raise awareness of ongoing education initiatives** within the organization by:
  - providing funding for the creation and distribution of educational materials
  - providing protected time for staff to participate in educational events
  - use various communication channels (e.g., newsletters, EHR messages) to notify staff when new anticoagulants are added to the formulary or when there are updates to anticoagulants in the formulary (e.g., new indications)<sup>6</sup>
- **Collaborate with anticoagulant patient advocacy groups** (e.g., [National Blood Clot Alliance](#)) and the local Patient and Family Advisory Council (PFAC) to share patient stories with staff

## STRENGTHENING AND SUSTAINING

- **Create a culture in which clinicians promote patient-centered education** through methods such as:
  - assessing a patient’s priorities and addressing their concerns (e.g., asking questions to elicit a detailed patient history, including obtaining information on mental health)
  - focusing on the three most important discussion topics, repeating the three items at the beginning and end of the conversation, and building on items in future conversations
  - creating workflows in which patient education occurs early in the care process (e.g., upon initial diagnosis) and at regular intervals
  - establishing professional competency requirements for Anticoagulation Stewardship
- **Implement a metric to track patients who receive anticoagulant management educational resources**
- **Diversify patient education materials** related to safe anticoagulant use by:
  - tailoring educational efforts and care based on an assessment of the patient population that is receiving or eligible for anticoagulants<sup>1</sup>
  - using diverse communication mediums to reach more patient populations (e.g., audio, video, pamphlets, and call-in line)<sup>1</sup>
  - engaging a language specialist, patient representative, and/or patient advocate to assess materials for reading level and accessibility
  - leveraging the EHR’s capabilities to communicate information and educational messages about anticoagulants to patients
  - offering continuing training and educational workshops for patients
- **Update prescription bottles or pharmacy package inserts**—while meeting regulatory requirements—to confirm the most relevant and important information is included

## Potential Barriers and Suggested Solutions to Advancing Education, Comprehension, and Competency

POTENTIAL BARRIERS	SUGGESTED SOLUTIONS
<p><b>Lack of advanced-level anticoagulation training resources</b></p>	<ul style="list-style-type: none"> <li>• Survey staff to identify areas they want to expand their knowledge on and what topics to add to the education curriculum</li> <li>• Ensure trainings are knowledge- and skill-based and address key elements of performance (e.g., host a training for each of the Anticoagulation Stewardship Core Elements)</li> <li>• Share resources from credible, trusted entities</li> <li>• Require continuous Anticoagulation Stewardship trainings and provide continuing education credits</li> </ul>
<p><b>Lack of funding to support anticoagulant training and initiatives</b></p>	<ul style="list-style-type: none"> <li>• Leverage free education resources, templates, and programs, and modify them to fit Anticoagulation Stewardship program needs</li> <li>• Engage patient volunteers or patient advocacy groups to incorporate the patient perspective and help offset costs</li> <li>• Leverage innovative sources of funding (e.g., grants, managed care organizations) to support education initiatives</li> </ul>
<p><b>Clinicians view education as “checking the box” and measuring progress is challenging</b></p>	<ul style="list-style-type: none"> <li>• Focus education on topic areas that cause patient harm at your organization (e.g., informed by discussions at morbidity and mortality meetings or data from an ADE root cause analysis) to make education more meaningful</li> <li>• Incorporate real-time educational support and resources (e.g., access to phone consults to answer real-time questions)</li> <li>• Create avenues for staff and patients to provide feedback on training and educational efforts and consistently adapt education initiatives based on the feedback</li> <li>• Leverage results from patient-reported outcomes (PROs) and patient engagement questions to measure the effectiveness of the patient education process</li> </ul>

## Tools and Resources

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### Provider Education

- [Anticoagulation Toolkit - Michigan Anticoagulation Quality Improvement Initiative \(MAQI<sup>2</sup>\)](#)
- [Academy On Demand - American Society of Hematology](#)
- [ISTH Academy - International Society on Thrombosis](#)
- [PGY2 Competency Areas - American Society of Health-System Pharmacists](#)
- [Residency Anticoagulation Management Rotation - Penn Medicine](#)
- [Ten Top Tips on Management of Anticoagulation - Nursing in Practice](#)

### Patient Education

- [Anticoagulation Patient Education - University of Washington Medicine: Pharmacy Services](#)
- [Blood Thinners: Staying Active and Healthy - AHRQ Health TV](#)
- [Patient Teaching Aid: Anticoagulants - US Pharmacist](#)
- [Patient Education Toolkit - Michigan Anticoagulation Quality Improvement Initiative \(MAQI<sup>2</sup>\)](#)
- [Patient Education: Warfarin \(Beyond the Basics\) - UpToDate](#)
- [Patient Guide to Preventing and Treating Blood Clots - AHRQ](#)
- [PEP TALK: Patients Education Patients - National Blood Clot Alliance](#)





# Drivers of Change

In addition to the Core Elements of Anticoagulation Stewardship, several key drivers of change can increase support and promote sustainable Anticoagulation Stewardship programs. **Drivers of change are larger systematic areas that individual health systems and clinicians cannot single handedly influence.** These drivers of change can create significant barriers or challenges that, when resolved, can lead to better anticoagulation management. These additional levers include policy, payment, education, accreditation, certification, measurement, and research. Diverse stakeholders, including federal entities, accreditation agencies, and partners in quality improvement, can leverage these key areas to promote lasting change in Anticoagulation Stewardship and patient safety.

## POLICY AND PAYMENT

The safe and effective use of anticoagulants require multidisciplinary collaboration. Current reimbursement protocols for anticoagulation services are often limited by billing policies, including restrictions on which provider types can bill for anticoagulant-related services. Deeper collaboration between policymakers and those involved in providing anticoagulation management services will help raise awareness of the scope of pharmacist practices and the services they provide, particularly for services provided by inpatient pharmacists. Opportunities exist for policymakers to expand payment and reimbursement policies in a manner that supports the most effective delivery of optimal anticoagulation care.

While virtual services have typically had different requirements and reimbursement policies compared to in-person modalities of care, the COVID-19 pandemic allowed for greater flexibility in reimbursement for telehealth-related services. Payers and policymakers can evaluate and formalize some of the flexible reimbursement structures for innovative anticoagulation practices (e.g., telehealth international normalized ratio [INR] services) piloted and permitted during the pandemic to maintain these reimbursement flexibilities long-term. As new reimbursement structures are put into place, payers may also consider exploring the use of incentives and penalties related to anticoagulant care and ADEs in their value-based purchasing models to support further uptake of Anticoagulant Stewardship practices.

## EDUCATION, ACCREDITATION, AND CERTIFICATION

Education, accreditation, and certification are powerful levers to enhance the acceptance and sustainability of new programs. To increase the likelihood of success, Anticoagulation Stewardship must be embedded into the healthcare system early in health profession curricula. Educational leaders and administrators can build Anticoagulation Stewardship training into residency and fellowship programs to support early learning (e.g, ASHP's accredited PGY2 Pharmacist Residency in Thrombosis and Hemostasis Management). Educational leaders within healthcare organizations can encourage the use of continued competency assessment tools, ongoing education, and dedicated learning sessions focused on Anticoagulation Stewardship to promote skills and increased expertise for practicing clinicians.

Leadership and administrators of healthcare delivery organizations must allocate resources to ensure the success and sustainability of an Anticoagulation Stewardship program. Accreditation and certification can be levers to support these resource investments. Program leaders and administrators could leverage national efforts to support embedding Anticoagulation Stewardship into the overall philosophy of safe patient care rather than considering it is a separate, siloed component of care delivery.

Organizational leaders can leverage national calls for action, national patient safety goals, and other national recommendations from safety, quality, and regulatory organizations to coordinate and advance organizational efforts. Sought-after accreditation and certification status can help administrators build the business case for investment in new programs, such as Anticoagulation Stewardship. Organizations can be innovative and consider new mechanisms for national certification, such as stakeholders advocating for funding and developing centralized anticoagulation centers. The certification of anticoagulation centers offers one pathway to support organizations with strong Anticoagulation Stewardship efforts and ensures patients are connected to facilities that provide high quality care.

## MEASUREMENT

Measurement can be a powerful tool in identifying aspects of Anticoagulation Stewardship that are working well and areas in which opportunities exist for improvement. Existing anticoagulation-related quality measures focus on prescribing, appropriateness of use, prophylaxis, INR control, medication reconciliation, patient safety and ADEs, and patient education. There are possibilities for measure developers and healthcare organizations to deploy measures aligned with the Core Elements of Anticoagulation Stewardship programs, related accreditation standards, and evidence-based guidelines to ensure organizations have foundational aspects in place. In areas where formal assessment resources do not exist, measure developers and organizations can use the Core Elements as a roadmap for future efforts. To align with the evolution of the healthcare quality measurement field, measure developers can explore developing PROs related to Anticoagulation Stewardship and its impacts on patient safety. Lastly, measurement can serve as a lever to promote future investment in Anticoagulation Stewardship by assessing cost avoidance from Anticoagulation Stewardship resource investments to date.

## RESEARCH

As the evidence and support for Anticoagulation Stewardship programs continue to build, research on Anticoagulation Stewardship programs will continue to evolve. Research advancements are a critical tool to garner support for further investments in Anticoagulation Stewardship programs and will be essential to creating long-term, sustainable programs and further national momentum. New research should be continuously shared with others to increase knowledge and inform healthcare systems of existing and new best practices. Recognizing that administrative support is often a key barrier to the success of an Anticoagulation Stewardship program, focusing research on quantifying the impact and cost savings of implementing a full Anticoagulation Stewardship program can help demonstrate ROI and success.



## Looking Forward

With anticoagulants consistently being identified as the most common cause of ADEs across various healthcare settings,<sup>12,30</sup> Anticoagulation Stewardship remains a critical need in healthcare. Dedicated Anticoagulation Stewardship programs have improved the quality and safety of anticoagulant use and clinical outcomes.<sup>31</sup> Moving forward, it is essential for healthcare leaders to allocate resources for dedicated Anticoagulation Stewardship efforts. A reduction in the number of anticoagulant-related ADEs will only occur when Anticoagulation Stewardship is integrated into the overall approach to patient care rather than it being seen as a separate, siloed segment of a patient's care journey.

Successful Anticoagulation Stewardship requires the commitment and partnership of stakeholders across healthcare. Using the strategies and tactics outlined in this Playbook, key healthcare stakeholders including but not limited to clinicians, patients, administrators, policymakers, and others, can promote the safe and effective use of anticoagulants while minimizing risks and patient harm. These strategies support healthcare organizations to establish or strengthen an existing Anticoagulation Stewardship program. While many of the opportunities and strategies included in this Playbook focus on the patient care setting, stakeholders outside of direct patient care can help advance the identified levers of change, such as payment, accreditation, education, measurement, and research, to drive continuous progress. Through coordinated actions, diverse stakeholders across the healthcare ecosystem can reduce adverse events, promote patient safety, and improve patient outcomes for the millions of Americans who receive anticoagulants each year<sup>1,31</sup>



# APPENDICES

## Appendix A: Key Contributors

The National Quality Forum (NQF) would like to thank and acknowledge the contributors who shared their time and expertise to inform the development of this Playbook. The contributors served in a variety of roles ranging from virtual forum attendees, key informants, and peer reviewers. NQF also appreciates the input and contributions of the Anticoagulation Forum Board of Directors, Technical Advisory Panel (TAP), and Mentored Implementation and Dissemination of Anticoagulation Stewardship (MIDAS) Steering Committee and participants. The conclusions, findings, and opinions expressed by the individuals who contributed to this publication do not necessarily reflect the official position of any contributor's affiliated organization.



**Ohenewaa Ahima, MD**

*Lieutenant Commander,*  
U.S. Public Health Service, Center  
of Drug Evaluation and Research,  
U.S. Food & Drug Administration

**Jack Ansell, MD, MACP**

*Founder, Past President,*  
Anticoagulation Forum

**Rose Baez, RN, MSN, MBA**

*Managing Director, Network Quality  
Innovation and Measurement,*  
Blue Cross Blue Shield Association

**Geoffrey D. Barnes, MD, MSc**

*Cardiologist and Vascular  
Medicine Specialist, Michigan  
Medicine; Co-Director, Michigan  
Anticoagulation Quality Improvement  
Initiative; Board Member,*  
Anticoagulation Forum

**Andrew Bland, MD, MSc**

*Chief Health Informatics Officer,*  
Grand River Nephrology

**Daniel Budnitz, MD, MPH,  
CAPT USPHS**

*Division of Healthcare Quality  
Promotion, Center for Disease  
Control and Prevention*

**Allison Burnett, PharmD, PhC, CACP**

*Antithrombosis Stewardship  
Pharmacist, University of New Mexico  
Health Sciences Center;  
President, Anticoagulation Forum*

**Nathan P. Clark, PharmD, FCCP,  
BCPS**

*Clinical Pharmacy Supervisor, Clinical  
Pharmacy Cardiovascular Services,  
Kaiser Permanente Colorado*

**Jean M. Connors, MD**

*Co-Medical Director of BWH  
Anticoagulation Management Service,  
Brigham and Women's Hospital;  
Medical Director, Hemostatic  
Anti-Thrombotic Stewardship*

**William F. Dager, MCCM, PharmD,  
BCPS, FCSHP, FCCP, FCCM, FASHP**

*Clinical Specialist, UC Davis  
Medical Center; Board Member,*  
Anticoagulation Forum

**Jennifer Davila, MD**

*Co-Director, Hemophilia Treatment  
Center, The Children's Hospital of  
Montefiore*

**Steven Deitelzweig, MD, MMM,  
SFHM, FACP, FACC**

*System Chairman for Hospital  
Medicine and Medical Director,  
Regional Business Development,  
Ochsner Health System; Board  
Member, Anticoagulation Forum*

**Paul Dobesh, PharmD, FACC, FAHA,  
FCCP, BCPS, BCCP**

*Professor, Department of Pharmacy  
Practice and Science, College of  
Pharmacy, University of Nebraska  
Medical Center*

**Cynthia Fenton, MD**

*Professor of Medicine, Division of  
Hospital Medicine, University of  
California, San Francisco*

**Elizabeth Goldstein, MBA**

*Executive Director,*  
Anticoagulation Forum

**Scott Kaatz, DO, MSc, FACP, SFHM**

*Hospitalist, Henry Ford Hospital; Past  
President, Anticoagulation Forum*

**Mary Ann Kliethermes, BS Pharm,  
PharmD, FAPhA, FCIOM**

*Director of Medication Safety and  
Quality, American Society of Health-  
System Pharmacists*

**Leslie Lake**

*Co-Founder and Managing Director,  
Invus Financial Advisors, LLC;  
Volunteer President, National Blood  
Clot Alliance*

**Janet Madden, RN, MS**

*Nurse Director, Massachusetts  
General Hospital*

**Anne Myrka, BS Pharm, RPh, MAT**

*Pharmacist and Senior Director of  
Drug Safety and Chronic Disease  
Management, Health Care Quality  
Improvement Program, IPRO*

**Bishoy Ragheb, PharmD, BCACP,  
CACP**

*Anticoagulation Program Manager,  
Tennessee Valley Health Systems;  
Board Member, Anticoagulation  
Forum*

**Todd Robertson**

*Patient Advocate, World Thrombosis  
Day Ambassador Of The Year 2021;  
Board Member, National Blood Clot  
Alliance*

**Anne Rose, PharmD**

*Manager Patient Care Services,  
Anticoagulation Clinic, Cardiology,  
Internal Medicine and Anticoagulation  
Stewardship, UW Health*

**Sachin J. Shah, MD, MPH**

*Assistant Professor, Medicine,  
University of California, San Francisco*

**Alex C. Spyropoulos, MD, FACP,  
FCCP, FRCPC**

*System Director, Anticoagulation  
and Clinical Thrombosis Services,  
Northwell Health*

**Darren Triller, PharmD**

*Director of Strategic Initiatives,  
Anticoagulation Forum*

**Toby Trujillo, PharmD, BCPS**

*Associate Professor, Department  
of Clinical Pharmacy, University of  
Colorado*

**Andrea Van Beek, RN, DNP,  
AGPCNP-BC**

*Nurse Practitioner, Anticoagulation  
Clinic, Visalia Medical Clinic/Kaweah  
Health Medical Group; Board Member,  
Anticoagulation Forum*

**Maureen Vance, MSN, RN**

*Clinical Project Director, Standards  
and Survey Methods, Joint  
Commission*

**Traci Wilkes Smith, JD**

*Senior Vice President, CSE; Board  
Member, National Blood Clot Alliance*

**Maura Wychowski, PharmD,  
BCPS, CACP**

*Clinical Pharmacist Specialist,  
Anticoagulation, Rochester  
Regional Health*



# Appendix B: URL Links To Resources

## GENERAL ANTICOAGULATION STEWARDSHIP RESOURCES

RESOURCES	ADDRESS
Anticoagulation Stewardship Education and Guidance - Anticoagulation Forum	<a href="https://acforum.org/web/education-stewardship.php">https://acforum.org/web/education-stewardship.php</a>
Resource Center - Anticoagulation Forum	<a href="https://acforum-excellence.org/Resource-Center/index.php">https://acforum-excellence.org/Resource-Center/index.php</a>
Resource Center Filtered for Anticoagulation Stewardship - Anticoagulation Forum	<a href="https://as.acforum-excellence.org/">https://as.acforum-excellence.org/</a>
Resource Center Filtered for Comprehensive Toolkits - Anticoagulation Forum	<a href="https://ct.acforum-excellence.org/">https://ct.acforum-excellence.org/</a>
Resource Center Filtered for Service Operational Performance - Anticoagulation Forum	<a href="https://so.acforum-excellence.org">https://so.acforum-excellence.org</a>
Resources to support Joint Commission Accredited organizations implementation of NPSG.03.05.01 - The Joint Commission	<a href="https://www.jointcommission.org/-/media/tjc/documents/standards/national-patient-safety-goals/historical/npsg_030501_resources.pdf?db=web&amp;hash=F6DCAA29747C1586309C3557E72959FF&amp;hash=F6DCAA29747C1586309C3557E72959FF">https://www.jointcommission.org/-/media/tjc/documents/standards/national-patient-safety-goals/historical/npsg_030501_resources.pdf?db=web&amp;hash=F6DCAA29747C1586309C3557E72959FF&amp;hash=F6DCAA29747C1586309C3557E72959FF</a>
Webinar: Understanding the Core Elements of Anticoagulation Stewardship - Anticoagulation Forum	<a href="https://player.vimeo.com/video/369910142">https://player.vimeo.com/video/369910142</a>

## CORE ELEMENT 1: SECURE ADMINISTRATIVE LEADERSHIP COMMITMENT

GENERAL RESOURCES	ADDRESS
Core Elements of Anticoagulation Stewardship Programs Guide	<a href="https://acforum.org/web/downloads/ACF%20Anticoagulation%20Stewardship%20Guide.pdf">https://acforum.org/web/downloads/ACF%20Anticoagulation%20Stewardship%20Guide.pdf</a>
Directive 1108.16(1), Anticoagulation Therapy Management - Department of Veterans Affairs, Veterans Health Administration	<a href="https://www.google.com/url?sa=t&amp;rct=j&amp;q=&amp;esrc=s&amp;source=web&amp;cd=&amp;ved=2ahUKewjlq9TN6Zj4AhUaczABHbLpAYUQFnoECBOQAQ&amp;url=https%3A%2F%2Fwww.va.gov%2Fvhapublications%2FViewPublication.asp%3Fpub_ID%3D9173&amp;usq=AOvVaw3Ad2R84VZS9wLEOVTimvr_">https://www.google.com/url?sa=t&amp;rct=j&amp;q=&amp;esrc=s&amp;source=web&amp;cd=&amp;ved=2ahUKewjlq9TN6Zj4AhUaczABHbLpAYUQFnoECBOQAQ&amp;url=https%3A%2F%2Fwww.va.gov%2Fvhapublications%2FViewPublication.asp%3Fpub_ID%3D9173&amp;usq=AOvVaw3Ad2R84VZS9wLEOVTimvr_</a>
National Action Plan for Adverse Drug Event Prevention: Anticoagulants - HHS	<a href="https://health.gov/sites/default/files/2019-09/ADE-Action-Plan-Anticoagulants.pdf">https://health.gov/sites/default/files/2019-09/ADE-Action-Plan-Anticoagulants.pdf</a>
National Patient Safety Goal (NPSG) 03.05.01 - The Joint Commission	<a href="https://www.jointcommission.org/-/media/tjc/documents/standards/national-patient-safety-goals/2022/npsg_chapter_hap_jan2022.pdf">https://www.jointcommission.org/-/media/tjc/documents/standards/national-patient-safety-goals/2022/npsg_chapter_hap_jan2022.pdf</a>
<b>Advocacy Resources</b>	
Administrative Oversight Gap Analysis: Hospitals and Skilled Nursing Facilities - Anticoagulation Forum	<a href="https://acforum.org/web/downloads/ACF%20Gap%20Analysis%20Report.pdf">https://acforum.org/web/downloads/ACF%20Gap%20Analysis%20Report.pdf</a>
Anticoagulation Stewardship: A National Movement - Anticoagulation Forum	<a href="https://acforum.org/web/downloads/ACF_National.pdf">https://acforum.org/web/downloads/ACF_National.pdf</a>
Anticoagulation Stewardship: Evidence of Impact - Anticoagulation Forum	<a href="https://acforum.org/web/downloads/ACF_Evidence.pdf">https://acforum.org/web/downloads/ACF_Evidence.pdf</a>
Anticoagulation Stewardship: Profiles in Progress - Anticoagulation Forum	<a href="https://acforum.org/web/downloads/ACF_Profiles_in_Progress_4.20.pdf">https://acforum.org/web/downloads/ACF_Profiles_in_Progress_4.20.pdf</a>

GENERAL RESOURCES	ADDRESS
US Emergency Department Visits Attributed to Medication Harms, 2017-2019 - Journal Article	<a href="https://pubmed.ncbi.nlm.nih.gov/34609453/">https://pubmed.ncbi.nlm.nih.gov/34609453/</a>
<b>Assessing Current Programs Resources</b>	
Checklist for Core Elements of Anticoagulation Stewardship Programs - Anticoagulation Forum	<a href="https://acforum.org/web/downloads/ACF-Anticoagulation-Stewardship-Checklist.pdf">https://acforum.org/web/downloads/ACF-Anticoagulation-Stewardship-Checklist.pdf</a>
Medication Safety Self Assessment for Antithrombotic Therapy - Institute for Safe Medication Practices	<a href="https://www.ismp.org/assessments/antithrombotic-therapy">https://www.ismp.org/assessments/antithrombotic-therapy</a>
Return on Investment Tool - Agency for Healthcare Research and Quality (AHRQ)	<a href="https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/systems/hospital/qitoolkit/combined/fl_combo_returnoninvestment.pdf">https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/systems/hospital/qitoolkit/combined/fl_combo_returnoninvestment.pdf</a>
<b>Learning From Other Stewardship Initiatives</b>	
Antibiotic Stewardship Core Element 1: Leadership Commitment - HQIN	<a href="https://hqin.org/antibiotic-stewardship-core-element-1-leadership-commitment/">https://hqin.org/antibiotic-stewardship-core-element-1-leadership-commitment/</a>
Antimicrobial Stewardship Gap Analysis Tool - Minnesota Department of Health	<a href="https://www.health.state.mn.us/diseases/antibioticresistance/hcp/asp/ltc/apxc.pdf">https://www.health.state.mn.us/diseases/antibioticresistance/hcp/asp/ltc/apxc.pdf</a>
How to Pitch an Antibiotic Stewardship Program to the Hospital C-Suite - Journal Article	<a href="https://pubmed.ncbi.nlm.nih.gov/27844028/">https://pubmed.ncbi.nlm.nih.gov/27844028/</a>

**CORE ELEMENT 2: ESTABLISH PROFESSIONAL ACCOUNTABILITY AND EXPERTISE**

GENERAL RESOURCES	ADDRESS
Anticoagulation Provider Toolkit - Michigan Anticoagulation Quality Improvement Initiative (MAQI <sup>2</sup> )	<a href="https://anticoagulationtoolkit.org/providers">https://anticoagulationtoolkit.org/providers</a>
Miscellaneous Anticoagulant Resources - American Society of Hematology	<a href="https://www.hematology.org/searchresults#?cludoquery=anticoagulant&amp;cludopage=1&amp;cludorefurl=https%3A%2F%2Fwww.hematology.org%2Feducation&amp;cludorefpt=Educations%20-%20Hematology.org&amp;cludoinputtype=standard">https://www.hematology.org/searchresults#?cludoquery=anticoagulant&amp;cludopage=1&amp;cludorefurl=https%3A%2F%2Fwww.hematology.org%2Feducation&amp;cludorefpt=Educations%20-%20Hematology.org&amp;cludoinputtype=standard</a>
<b>Certification Resources</b>	
Anticoagulation Board Certification: Certified Anticoagulation Care Provider (CACP) - NCBAP	<a href="https://ncbap.org/web/">https://ncbap.org/web/</a>
Anticoagulation Certificate - American Society of Health - System Pharmacists	<a href="https://elearning.ashp.org/products/8755/anticoagulation-certificate">https://elearning.ashp.org/products/8755/anticoagulation-certificate</a>
Anticoagulation Therapy Management Program - University of Southern Indiana College of Nursing and Health Professions	<a href="https://www.usi.edu/health/center-for-health-professions-lifelong-learning/certificate-programs/anticoagulation-therapy-management-program/">https://www.usi.edu/health/center-for-health-professions-lifelong-learning/certificate-programs/anticoagulation-therapy-management-program/</a>
Anticoagulation Therapy Management for Pharmacists - University of Florida College of Pharmacy	<a href="https://cpe.pharmacy.ufl.edu/2020/12/30/anticoagulation-therapy-management-for-pharmacists/">https://cpe.pharmacy.ufl.edu/2020/12/30/anticoagulation-therapy-management-for-pharmacists/</a>
Anticoagulation Centers of Excellence: Becoming a Center of Excellence - Anticoagulation Forum	<a href="https://acforum-excellence.org/?page=centersofexcellence&amp;resource_page=howto">https://acforum-excellence.org/?page=centersofexcellence&amp;resource_page=howto</a>
<b>Clinical Guidelines Resources</b>	
American College of Cardiology Library of Guidelines and Clinical Documents	<a href="https://www.acc.org/Guidelines">https://www.acc.org/Guidelines</a>
American College of Chest Physicians (CHEST) Pulmonary Vascular: Clinical Guidelines and Consensus Statements	<a href="https://www.chestnet.org/Guidelines/Pulmonary-Vascular">https://www.chestnet.org/Guidelines/Pulmonary-Vascular</a>
American Society of Hematology 2018 Guidelines for Management of Venous Thromboembolism: Optimal Management of Anticoagulation Therapy - American Society of Hematology	<a href="https://ashpublications.org/bloodadvances/article/2/22/3257/16107/American-Society-of-Hematology-2018-guidelines-for?searchresult=1">https://ashpublications.org/bloodadvances/article/2/22/3257/16107/American-Society-of-Hematology-2018-guidelines-for?searchresult=1</a>

GENERAL RESOURCES	ADDRESS
<b>Guidance From Existing Programs Resources</b>	
Anticoagulation Program - University of Wisconsin Medicine	<a href="https://www.uwhealth.org/anticoagulation">https://www.uwhealth.org/anticoagulation</a>
Anticoagulation Resources for Health Professionals - University of California, Davis	<a href="https://health.ucdavis.edu/pharmacy/anticoag/Healthcare-Professionals-Anticoagulation-Resources.html">https://health.ucdavis.edu/pharmacy/anticoag/Healthcare-Professionals-Anticoagulation-Resources.html</a>
Anticoagulation Services - University of Washington Medicine	<a href="https://sites.uw.edu/anticoag">https://sites.uw.edu/anticoag</a>
<b>Learning from Other Stewardship Initiatives Resources</b>	
Antibiotic Stewardship Core Element 2: Accountability - HQIN	<a href="https://hqin.org/antibiotic-stewardship-core-element-2-accountability/">https://hqin.org/antibiotic-stewardship-core-element-2-accountability/</a>
Guidance for the Knowledge and Skills Required for Antimicrobial Stewardship Leaders - Journal Article	<a href="https://www.jstor.org/stable/10.1086/678592#metadata_info_tab_contents">https://www.jstor.org/stable/10.1086/678592#metadata_info_tab_contents</a>
Toolkit to Implement, Monitor, and Sustain an Antimicrobial Stewardship Program: Nursing Home - AHRQ	<a href="https://www.ahrq.gov/nhguide/toolkits/implement-monitor-sustain-program/toolkit1-start-program.html">https://www.ahrq.gov/nhguide/toolkits/implement-monitor-sustain-program/toolkit1-start-program.html</a>

### CORE ELEMENT 3: ENGAGE MULTIDISCIPLINARY SUPPORT

GENERAL RESOURCES	ADDRESS
Antithrombotic Stewardship: A Multidisciplinary Team Approach Towards Improving Antithrombotic Therapy Outcomes During and After Hospitalisation: A Study Protocol - Journal Article	<a href="https://bmjopen.bmj.com/content/bmjopen/6/12/e011537.full.pdf">https://bmjopen.bmj.com/content/bmjopen/6/12/e011537.full.pdf</a>
Development of Multidisciplinary Anticoagulation Management Guidelines for Patients Receiving Durable Mechanical Circulatory Support - Journal Article	<a href="https://journals.sagepub.com/doi/pdf/10.1177/1076029619837362">https://journals.sagepub.com/doi/pdf/10.1177/1076029619837362</a>
How to Guide: Multidisciplinary Rounds - Institute for Healthcare Improvement	<a href="http://www.ihl.org/resources/Pages/Tools/HowtoGuideMultidisciplinaryRounds.aspx">http://www.ihl.org/resources/Pages/Tools/HowtoGuideMultidisciplinaryRounds.aspx</a>
Reducing Error in Anticoagulant Dosing via Multidisciplinary Team Rounding at Point of Care - Journal Article	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5406843/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5406843/</a>
<b>Making a Case Resources</b>	
Effect of Antithrombotic Stewardship on the Efficacy and Safety of Antithrombotic Therapy During and After Hospitalization: A Study Protocol - Journal Article	<a href="https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0235048">https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0235048</a>
The Effect of Hospital-Based Antithrombotic Stewardship on Adherence to Anticoagulant Guidelines - Journal Article	<a href="https://www.pubmed.ncbi.nlm.nih.gov/31020598/">https://www.pubmed.ncbi.nlm.nih.gov/31020598/</a>
<b>Building a Culture of Safety Resources</b>	
Survey on Patient Safety Culture™ (SOPS®) - AHRQ	<a href="https://www.ahrq.gov/sops/surveys/index.html">https://www.ahrq.gov/sops/surveys/index.html</a>

**CORE ELEMENT 4: PERFORM DATA COLLECTION, TRACKING, AND ANALYSIS**

DATA COLLECTION RESOURCES	ADDRESS
Assessment of ICD-10-CM Code Assignment Validity for Case Finding of Outpatient Anticoagulant-Related Bleeding Among Medicare Beneficiaries - Journal Article	<a href="https://pubmed.ncbi.nlm.nih.gov/31144403/">https://pubmed.ncbi.nlm.nih.gov/31144403/</a>
Implementation of the Management of Anticoagulation in the Periprocedural Period App Into an Electronic Health Record: A Prospective Cohort Study - Journal Article	<a href="https://journals.sagepub.com/doi/full/10.1177/1076029620925910">https://journals.sagepub.com/doi/full/10.1177/1076029620925910</a>
Improving Anticoagulation Measurement - Journal Article	<a href="https://www.ahajournals.org/doi/10.1161/circoutcomes.115.001789">https://www.ahajournals.org/doi/10.1161/circoutcomes.115.001789</a>
<b>Data Collection Resources</b>	
Implementation of a Fast Healthcare Interoperability Resources (FHIR)-Based Clinical Decision Support Tool for Calculating CHA2DS2-VASc Scores - Journal Article	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7266084/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7266084/</a>
Instructions to Develop a Dashboard - Centers for Medicare & Medicaid Services (CMS)	<a href="https://www.cms.gov/medicare/provider-enrollment-and-certification/qapi/downloads/instrdevdshbddebedits.pdf">https://www.cms.gov/medicare/provider-enrollment-and-certification/qapi/downloads/instrdevdshbddebedits.pdf</a>
Patient Safety Organization (PSO) Program - Agency for Healthcare Research Quality (AHRQ)	<a href="https://pso.ahrq.gov/pso">https://pso.ahrq.gov/pso</a>
<b>Measurement Resources</b>	
Examples of a Health Care Failure Mode and Effects Analysis for Anticoagulants - Institute of Safe Medication Practices	<a href="https://www.ismp.org/sites/default/files/attachments/2018-02/FMEAofAnticoagulants.pdf">https://www.ismp.org/sites/default/files/attachments/2018-02/FMEAofAnticoagulants.pdf</a>
Global Trigger Tool for Measuring Adverse Events - Institute for Healthcare Improvement	<a href="http://www.ihl.org/resources/Pages/Tools/IHIGlobalTriggerToolforMeasuringAEs.aspx">http://www.ihl.org/resources/Pages/Tools/IHIGlobalTriggerToolforMeasuringAEs.aspx</a>
QualityNet - Centers for Medicare and Medicaid Services	<a href="https://qualitynet.cms.gov/">https://qualitynet.cms.gov/</a>
Quality Payment Program - Center for Medicare and Medicaid Services	<a href="https://qpp.cms.gov/mips/explore-measures">https://qpp.cms.gov/mips/explore-measures</a>
Quality Positioning System - National Quality Forum	<a href="https://www.qualityforum.org/QPS/">https://www.qualityforum.org/QPS/</a>

## CORE ELEMENT 5: IMPLEMENT SYSTEMATIC CARE

GENERAL RESOURCES	ADDRESS
Anticoagulation Forum Rapid Resources – Anticoagulation Forum	<a href="http://rr.acforum-excellence.org/">http://rr.acforum-excellence.org/</a>
Resources Center – Anticoagulation Forum	<a href="https://acforum-excellence.org/Resource-Center/index.php">https://acforum-excellence.org/Resource-Center/index.php</a>
Web and Mobile Apps – American College of Cardiology	<a href="https://www.acc.org/Tools-and-Practice-Support/Mobile-Resources">https://www.acc.org/Tools-and-Practice-Support/Mobile-Resources</a>
<b>Implementation Resources</b>	
Anticoagulation Therapy: Understanding the Requirements – The Joint Commission	<a href="https://www.jointcommission.org/standards/standard-faqs/ambulatory/national-patient-safety-goals-npsg/000002244/">https://www.jointcommission.org/standards/standard-faqs/ambulatory/national-patient-safety-goals-npsg/000002244/</a>
Quality Enhancement Research Initiative (QUERI) – U.S. Department of Veterans Affairs	<a href="https://www.queri.research.va.gov/tools/roadmap.cfm">https://www.queri.research.va.gov/tools/roadmap.cfm</a>
The Development of Evidence-Based Care Recommendations to Improve the Safe Use of Anticoagulants in Children - Journal Article	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3470435/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3470435/</a>
<b>Quality Improvement Resources</b>	
Improve Patient Outcomes - Michigan Anticoagulation Quality Improvement Initiative (MAQI <sup>2</sup> )	<a href="http://www.maqi2.org/initiatives/pt_outcomes_basic">http://www.maqi2.org/initiatives/pt_outcomes_basic</a>
Improving the Safe Use of Direct Oral Anticoagulants for Veterans: Direct Oral Anticoagulants (DOAC) Dashboard - U.S. Department of Veterans Affairs	<a href="https://www.hsrd.research.va.gov/impacts/oral-anticoagulants.cfm">https://www.hsrd.research.va.gov/impacts/oral-anticoagulants.cfm</a>
Order Sets - Anticoagulation Forum	<a href="https://acforum.org/web/education-sets.php">https://acforum.org/web/education-sets.php</a>
<b>Examples Resources</b>	
Applying Population Health Approaches to Improve Safe Anticoagulant Use in the Outpatient Setting: The DOAC Dashboard Multi-Cohort Implementation Evaluation Study Protocol - Journal Article	<a href="https://implementationscience.biomedcentral.com/article/10.1186/s13012-020-01044-5">https://implementationscience.biomedcentral.com/article/10.1186/s13012-020-01044-5</a>
Clinical Guideline and Practice Protocol - Atrius Health Anticoagulation Management Service	<a href="https://acforum-excellence.org/Resource-Center/resource_files/-2021-08-05-172342.pdf">https://acforum-excellence.org/Resource-Center/resource_files/-2021-08-05-172342.pdf</a>
Inpatient Antithrombotic Management Procedures – University of New Mexico Hospitals	<a href="https://acforum-excellence.org/Resource-Center/resource_files/1361-2019-05-23-121319.pdf">https://acforum-excellence.org/Resource-Center/resource_files/1361-2019-05-23-121319.pdf</a>
Strategies for Venous Thromboembolism Prevention - John Hopkins Medicine	<a href="https://www.hopkinsmedicine.org/armstrong_institute/improvement_projects/infections_complications/VTE/strategies.html">https://www.hopkinsmedicine.org/armstrong_institute/improvement_projects/infections_complications/VTE/strategies.html</a>
Working Smarter, Not Harder: Evaluating a Population Health Approach to Anticoagulation Therapy Management - Journal Article	<a href="https://pubmed.ncbi.nlm.nih.gov/33222115/">https://pubmed.ncbi.nlm.nih.gov/33222115/</a>

**CORE ELEMENT 6: FACILITATE TRANSITIONS OF CARE**

EXAMPLE RESOURCES	ADDRESS
Project RED (Re-Engineered Discharge) - Boston Medical Center	<a href="https://www.bu.edu/fammed/projectred/">https://www.bu.edu/fammed/projectred/</a>
Peri-Procedure Management of Anticoagulants - The University of Texas MD Anderson Cancer Center	<a href="https://www.mdanderson.org/content/dam/mdanderson/documents/for-physicians/algorithms/clinical-management/clin-management-peri-procedure-anticoagulants-web-algorithm.pdf">https://www.mdanderson.org/content/dam/mdanderson/documents/for-physicians/algorithms/clinical-management/clin-management-peri-procedure-anticoagulants-web-algorithm.pdf</a>
<b>Effective Discharge Resources</b>	
Anticoagulation Discharge Communication (AC-DC) Audit Tool - IPRO	<a href="https://ipro.org/wp-content/uploads/2014/10/ACDC-Audit-Tool-Version-2-for-Website.pdf">https://ipro.org/wp-content/uploads/2014/10/ACDC-Audit-Tool-Version-2-for-Website.pdf</a>
Defining Minimum Necessary Anticoagulation-Related Communication at Discharge: Consensus of the Care Transitions Task Force of the New York State Anticoagulation Coalition - Joint Commission	<a href="https://acforum-excellence.org/Resource-Center/resource_files/1194-2018-08-09-121354.pdf">https://acforum-excellence.org/Resource-Center/resource_files/1194-2018-08-09-121354.pdf</a>
Facilitating Anticoagulation for Safer Transitions: Preliminary Outcomes from an Emergency Department Deep Vein Thrombosis Discharge Program - Journal Article	<a href="https://pubmed.ncbi.nlm.nih.gov/25502127/">https://pubmed.ncbi.nlm.nih.gov/25502127/</a>
Transitions of Care for Patients With Venous Thromboembolism - Journal Article	<a href="https://evtoday.com/articles/2021-july-supplement/transitions-of-care-for-patients-with-venous-thromboembolism">https://evtoday.com/articles/2021-july-supplement/transitions-of-care-for-patients-with-venous-thromboembolism</a>
<b>Safer Transitions Resources</b>	
Anticoagulation Essential Communication Elements for Transitions of Care Guide - Quality Innovation Network - Quality Improvement Organizations (IPRO QIN-QIO)	<a href="https://acforum-excellence.org/Resource-Center/resource_files/1867-2021-10-27-122815.pdf">https://acforum-excellence.org/Resource-Center/resource_files/1867-2021-10-27-122815.pdf</a>
Anticoagulation: Updated Guidelines for Outpatient Management - Journal Article	<a href="https://www.aafp.org/pubs/afp/issues/2019/1001/p426.html">https://www.aafp.org/pubs/afp/issues/2019/1001/p426.html</a>
Guidance for the Practical Management of Warfarin Therapy in the Treatment of Venous Thromboembolism - Journal Article	<a href="https://pubmed.ncbi.nlm.nih.gov/26780746/">https://pubmed.ncbi.nlm.nih.gov/26780746/</a>
SBAR Tool: Situation Background Assessment Recommendation - Institute for Healthcare Improvement	<a href="http://www.ihp.org/resources/Pages/Tools/SBARToolkit.aspx">http://www.ihp.org/resources/Pages/Tools/SBARToolkit.aspx</a>



**CORE ELEMENT 7: ADVANCE EDUCATION, COMPREHENSION, AND COMPETENCY**

<b>PROVIDER EDUCATION RESOURCES</b>	<b>ADDRESS</b>
<b>Anticoagulation Toolkit - Michigan Anticoagulation Quality Improvement Initiative (MAQI<sup>2</sup>)</b>	<a href="https://anticoagulationtoolkit.org/sites/default/files/toolkit_pdfs/toolkitfull_2.6.pdf">https://anticoagulationtoolkit.org/sites/default/files/toolkit_pdfs/toolkitfull_2.6.pdf</a>
<b>Academy On Demand - American Society of Hematology</b>	<a href="https://www.hematology.org/education">https://www.hematology.org/education</a>
<b>ISTH Academy - International Society on Thrombosis</b>	<a href="https://academy.isth.org/isth/#!*menu=16*browseby=9*sor tby=1*trend=4342">https://academy.isth.org/isth/#!*menu=16*browseby=9*sor tby=1*trend=4342</a>
<b>PGY2 Competency Areas - American Society of Health-System Pharmacists</b>	<a href="https://www.ashp.org/professional-development/residency-information/residency-program-resources/residency-accreditation/pgy2-competency-areas?loginreturnUrl=SSOCheckOnly">https://www.ashp.org/professional-development/residency-information/residency-program-resources/residency-accreditation/pgy2-competency-areas?loginreturnUrl=SSOCheckOnly</a>
<b>Residency Anticoagulation Management Rotation - Penn Medicine</b>	<a href="https://www.pennmedicine.org/for-health-care-professionals/fellowship-and-residency-programs/pennsylvania-hospital-programs/residency-programs/pennsylvania-hospital-pharmacy-residency/pgy1-acute-care-focus-residency/required-block-learning">https://www.pennmedicine.org/for-health-care-professionals/fellowship-and-residency-programs/pennsylvania-hospital-programs/residency-programs/pennsylvania-hospital-pharmacy-residency/pgy1-acute-care-focus-residency/required-block-learning</a>
<b>Ten Top Tips on Management of Anticoagulation - Nursing in Practice</b>	<a href="https://www.nursinginpractice.com/clinical/cardiology/ten-top-tips-on-management-of-anticoagulation/">https://www.nursinginpractice.com/clinical/cardiology/ten-top-tips-on-management-of-anticoagulation/</a>
<b>Patient Education Resources</b>	
<b>Anticoagulation Patient Education - University of Washington Medicine: Pharmacy Services</b>	<a href="http://depts.washington.edu/anticoag/home/content/patient-education-0">http://depts.washington.edu/anticoag/home/content/patient-education-0</a>
<b>Blood Thinners: Staying Active and Healthy - AHRQ Health TV</b>	<a href="https://www.youtube.com/watch?v=bvDIDz9UIPY">https://www.youtube.com/watch?v=bvDIDz9UIPY</a>
<b>Patient Education Toolkit, Michigan Anticoagulation Quality Improvement Initiative (MAQI<sup>2</sup>)</b>	<a href="https://anticoagulationtoolkit.org/patients">https://anticoagulationtoolkit.org/patients</a>
<b>Patient Education: Warfarin (Beyond the Basics) - UpToDate</b>	<a href="https://www.uptodate.com/contents/warfarin-beyond-the-basics">https://www.uptodate.com/contents/warfarin-beyond-the-basics</a>
<b>Patient Guide to Preventing and Treating Blood Clots - AHRQ</b>	<a href="https://www.ahrq.gov/patients-consumers/prevention/disease/bloodclots.html">https://www.ahrq.gov/patients-consumers/prevention/disease/bloodclots.html</a>
<b>Patient Teaching Aid: Anticoagulants - US Pharmacist</b>	<a href="https://www.uspharmacist.com/CMSDocuments/2015/2/PTA1502-Anticoagulants-12_12mb.pdf">https://www.uspharmacist.com/CMSDocuments/2015/2/PTA1502-Anticoagulants-12_12mb.pdf</a>
<b>PEP TALK: Patients Education Patients - National Blood Clot Alliance</b>	<a href="https://www.stoptheclot.org/pep-talk-patients-educating-patients/">https://www.stoptheclot.org/pep-talk-patients-educating-patients/</a>

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# Appendix D: NQF Staff

**Kathleen Giblin**

Senior Vice President

**Allie Herr**

Senior Managing Director

**Meredith Gerland**

Senior Director

**Chelsea Lynch**

Director

**Carolee Lantigua**

Manager

**Monika Harvey**

Project Manager

**Evelyn Thomas**

Specialist

**Barbara Burchard**

Coordinator

**Mia Vanelli**

Associate

**NATIONAL QUALITY FORUM**  
1099 14th Street, NW  
Washington, DC 20005

**[qualityforum.org](http://qualityforum.org)**

**ANTICOAGULATION FORUM**  
17 Lincoln Street  
Newton, MA 02461

**[acforum.org](http://acforum.org)**