War on Warfarin: Integrating DOACs into your Anticoagulation Service

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Brigham and Women’s Hospital
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Disclosures

- I have no financial conflict of interest related to this presentation
Objectives

1. Review the importance of anticoagulation management services in managing warfarin
2. Describe national trends in anticoagulation
3. Discuss the role of anticoagulation management services (AMS) in managing direct oral anticoagulants (DOACs)
4. Consider different approaches to integrating DOACs into your AMS
5. Implement policy and procedures to standardize patient care
Advantages of Anticoagulation Management Services

Improved patient care through:

- Dedicated sites of service for anticoagulation
  - Run by pharmacists, nurses, or physicians
- Consistent provider-patient interactions
  - Opportunities to review patient medications, dietary changes, and clinical status
  - Initial and ongoing patient education
- Systematic follow up
  - Can improve adherence to medication and PT/INR monitoring
- Quality assurance measures
  - Ensures quality anticoagulation by tracking TTR, critical INR results and clinical events
In general, a TTR of 65 to 70% is considered to be good quality control.
National Trends in Anticoagulation

- A-fib visits with AC use increased from 51.9% to 66.9% between 2009 and 2014
- DOAC usage rose 73.6% from early 2014 through 2015
- Warfarin use decreased by 10.9% from early 2014 through 2015

BWH AMS Patient Census

Quarterly Census 2011 - 2016

Number of Patients

Quarters/Years

Patients
New Referals

0 500 1000 1500 2000 2500 3000 3500 4000

Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 2011 2012 2013 2014 2015 2016
BWH AMS Patient Population

Percent Diagnosis Through 2015

- Atrial Fibrillation: 52%
- Venous Thromboembolism: 24%
- Prosthetic Heart Valve: 11%
- Ventricular Assist Device: 11%
- Other: 2%

Afib, VTE, Prosthetic Valve, VAD, Other
FDA Reported Events

- An estimated 2 to 4 million persons suffered serious, disabling, or fatal injury associated with prescription drug therapy in 2011.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Drug Name</th>
<th>Year Approved</th>
<th>Direct Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DABIGATRAN</td>
<td>2010</td>
<td>817</td>
</tr>
<tr>
<td>2</td>
<td>WARFARIN</td>
<td>1954</td>
<td>490</td>
</tr>
<tr>
<td>3</td>
<td>LEVOFLOXACIN</td>
<td>1996</td>
<td>393</td>
</tr>
<tr>
<td>4</td>
<td>CARBOPLATIN</td>
<td>1989</td>
<td>376</td>
</tr>
</tbody>
</table>

Inhibiting clotting ranks among the highest risk of all drug treatments.
How can AMS help?

- 4,863 patients at 67 sites
- Adherence defined as proportion of days covered (PDC) ≥ 80%
- Median site adherence rate was 74%
How can AMS help?

Participating Site-Level Characteristics Stratified by Site Performance

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No. (%)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site-Level Practices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selection criteria including review of adherence</td>
<td>20 (83.3) vs 11 (64.7)</td>
<td>.12</td>
</tr>
<tr>
<td>Pharmacist-led education</td>
<td>20 (83.3) vs 10 (58.8)</td>
<td>.06</td>
</tr>
<tr>
<td>Pharmacist-led adverse event monitoring</td>
<td>22 (91.7) vs 6 (35.3)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Local performance measure of proportion of patients adherent to dabigatran</td>
<td>3 (13.0) vs 0</td>
<td>.12</td>
</tr>
<tr>
<td>Use of tracking software for patient adherence to dabigatran</td>
<td>3 (13.0) vs 0</td>
<td>.12</td>
</tr>
</tbody>
</table>

* High-performing sites = Achieved adherence rates ≥ 74%
± Low-performing sites = Achieved adherence rates ≤ 74%

How can AMS help?

Participating Site-Level Characteristics Stratified by Site Performance

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No. (%)</th>
<th>High-Performing Sites (n = 23 With 1828 Patients)</th>
<th>Low-Performing Sites (n = 18 With 1157 Patients)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of follow-up, mo</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8 (33.3)</td>
<td>4 (23.5)</td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>6</td>
<td>5 (20.8)</td>
<td>1 (5.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥12</td>
<td>9 (37.5)</td>
<td>1 (5.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collaborative care for nonadherent patients</td>
<td>16 (66.7)</td>
<td>4 (23.5)</td>
<td></td>
<td>.01</td>
</tr>
<tr>
<td>Involvement of anticoagulation clinic</td>
<td>18 (78.3)</td>
<td>4 (23.5)</td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Mode of patient contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone clinics</td>
<td>12 (52.2)</td>
<td>6 (33.4)</td>
<td></td>
<td>.03</td>
</tr>
<tr>
<td>Face-to-face clinics</td>
<td>3 (13.0)</td>
<td>1 (5.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tailored to patient preference</td>
<td>5 (21.7)</td>
<td>1 (5.6)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* High-performing sites = Achieved adherence rates ≥ 74%
± Low-performing sites = Achieved adherence rates ≤ 74%

AMS Role in DOACs

**Initial**
- Assess patient, medication and dose selection
- Confirm initial fill of prescribed medications
- Ensure proper acute treatment and transition to maintenance doses
- Facilitate transition to and from other anticoagulants

**Ongoing**
- Facilitate proper labeled dose transitions
- Manage periprocedural anticoagulation
- Facilitate discontinuation of anticoagulants upon treatment completion
- Manage minor bleeding and triage clinically relevant events

**Initial and Ongoing**
- Identify drug-drug interactions
- Provide patient education
- Assess medication adherence
- Obtain laboratory markers
Target DOAC Patient Population

1. Rely on physician referrals to drive your patient population

2. Inherit all patients within a specific primary care or specialty office

3. Follow all patients initially then discharge stable patients to physician

4. Manage all DOAC patients within an institution

5. Only manage high risk patients (variable Scr, poor adherence, etc.)

Patients with approved indication for use of DOACs
AMS Intervention

What is your intervention?
- Patient chart review
- Face-to-face initial or continued follow up
- Telephone follow up
- Telemedicine visits
- Health care provider consults

When will you intervene?
- At the time of qualifying diagnosis
- During the anticoagulant selection process
- After prescription is given to the patient
- At the time of discharge
- Only within high risk patients and situations
Managing Patients on DOACs

- Creating policy and procedure to standardize important aspects of patient care
  1. Patient education
  2. Assessing adherence
  3. Medication management plans and routine follow up
  4. Converting to and from anticoagulants
  5. Periprocedural management of each DOAC
"To achieve better patient outcomes, patient education is a vital component of an anticoagulation therapy program."

Aim: Reduce likelihood of patient harm associated with the use of anticoagulation therapy

Effective anticoagulation patient education

Face-to-face initial interaction
Educated by trained professional

Identify the importance of:
Consistent follow up monitoring
Drug interactions
Potential for adverse drug reactions
Compliance
Assessing Adherence

When
- At time of dose transition
- On a tapered schedule
- According to individual patient needs

On a fixed schedule

How
- Telephone or telemedicine visits
- Mail out or online survey
- Text or Smartphone application
- Face-to-face
## Assessing Adherence

### Follow-up Questionnaire

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Able to state drug name, strength, description (color, etc.)</td>
<td></td>
</tr>
<tr>
<td>Explains medication indication</td>
<td></td>
</tr>
<tr>
<td>States daily dose (amount/number of tabs)</td>
<td></td>
</tr>
<tr>
<td>Reports missing one or more doses</td>
<td></td>
</tr>
<tr>
<td>Verbalizes proper management of a missed dose</td>
<td></td>
</tr>
<tr>
<td>Understands the importance of adherence</td>
<td></td>
</tr>
<tr>
<td>Able to identify signs and symptoms of thrombosis and hemorrhage</td>
<td></td>
</tr>
<tr>
<td>Patient understands the importance of reporting changes in medications including prescription, herbal, and over-the-counter medications</td>
<td></td>
</tr>
<tr>
<td>Able to schedule visits for lab values and follow-up</td>
<td></td>
</tr>
</tbody>
</table>
Medication Management Plan

DOAC MONITORING CHECKLIST
FOR EACH FOLLOWUP VISIT
1. Adherence (including Rx refills)
2. Thromboembolic events
3. Bleeding events/risk factors
4. Adverse effects
5. Medication review for potentially interacting drugs including ASA and NSAIDs (see https://depts.washington.edu/anticoag)
6. Reassessment of appropriateness and duration of therapy
7. Repeat CBC
8. Repeat SCR/Calculate CrCl

1 Clinical judgment should be used to determine frequency of monitoring based on patient's overall health, compliance, and risk factors

1 Week Follow-Up
- Is patient experiencing dyspepsia?
  - Yes: Take with food and full glass of water
  - No: Consider PPI or H2 blocker
- Is patient experiencing other adverse side effects?
  - Yes: Treat any modifiable factors and/or consider switching to another agent
  - No: Continue medication

At 3 weeks

At 3 Months

At 6 months

Continuing follow-up After 1st 6 Months
1. CrCl > 60 m/min: Checklist once yearly including annual LFTs
2. CrCl < 60 mL, age < 75, wt < 60kg or medically fragile: Checklist q6months and annual LFTs

Any concerns?
- Yes: Reassess risk vs benefit
- No: Continue routine scheduled follow-up

Adiseanax for treatment of VTE: change dose from 1mg bid (for 1 week) to 5mg bid
Rivaroxaban for treatment of VTE: change dose from 15mg bid (for 3 weeks) to 20mg qday

https://depts.washington.edu/anticoag/home/
# Converting to and from DOACs

<table>
<thead>
<tr>
<th>CONVERSION</th>
<th>RECOMMENDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>warfarin to rivaroxaban</td>
<td>Stop warfarin and start rivaroxaban when INR &lt; 2</td>
</tr>
<tr>
<td></td>
<td><em>(manufacturer recommends stop warfarin and start rivaroxaban when INR &lt; 3)</em></td>
</tr>
<tr>
<td>rivaroxaban to warfarin</td>
<td>Start warfarin and stop rivaroxaban 3 days later</td>
</tr>
<tr>
<td><em>(NOTE: rivaroxaban is not intended to be used as a short term &quot;bridge&quot; to warfarin. These recommendations refer to transitioning patients who are taking rivaroxaban on a long term basis and are switching to warfarin instead)</em></td>
<td>OR IF continuous, uninterrupted anticoagulation is necessary:</td>
</tr>
<tr>
<td></td>
<td>a) stop rivaroxaban</td>
</tr>
<tr>
<td></td>
<td>b) begin both parenteral anticoagulation (LMWH or UFH) and warfarin at the time the next dose of rivaroxaban would have been given</td>
</tr>
<tr>
<td></td>
<td>c) stop the parenteral anticoagulant when INR reaches an acceptable range</td>
</tr>
<tr>
<td>LMWH/ fondaparinux to rivaroxaban</td>
<td>Stop parenteral anticoagulant and administer rivaroxaban 0-2 hours before the next dose of parenteral drug would have been given</td>
</tr>
</tbody>
</table>
# Periprocedural Management

<table>
<thead>
<tr>
<th>CrCI</th>
<th>T 1/2</th>
<th>Time of last dose of dabigatran before procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 80 ml/min</td>
<td>14 hrs</td>
<td>At least 24 hrs</td>
</tr>
<tr>
<td>50 – 79 ml/min</td>
<td>17 hrs</td>
<td>At least 36 hrs</td>
</tr>
<tr>
<td>30-49 ml/min</td>
<td>19 hrs</td>
<td>At least 48 hrs</td>
</tr>
<tr>
<td>15-29 ml/min</td>
<td>28 hrs</td>
<td>At least 72 hrs</td>
</tr>
<tr>
<td>&lt; 15 ml/min</td>
<td>34 hrs</td>
<td>Consider measuring drug activity with the dabigatran assay to determine absence of drug effect</td>
</tr>
</tbody>
</table>

*High risk of bleeding*¹

(major surgery, spinal puncture or placement of spinal/epidural catheter, and other situations in which complete hemostasis may be required)

¹ ASRA 2015 Update: Hold 5 days for all patients prior to neuraxial procedures
## Importance of Disease State Management Software

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Organized documentation of patient interactions</td>
<td>✓ Cost</td>
</tr>
<tr>
<td>✓ Systematic approach to follow up</td>
<td>✓ Not fully integrated into institution’s EHR</td>
</tr>
<tr>
<td>✓ Increased productivity and efficiency</td>
<td></td>
</tr>
<tr>
<td>✓ Event tracking</td>
<td></td>
</tr>
<tr>
<td>✓ Quality assurance reports</td>
<td></td>
</tr>
<tr>
<td>✓ Built in logic to promote protocol driven care</td>
<td></td>
</tr>
</tbody>
</table>
Helpful tips for integrating DOACs in your AMS

- Define a target patient population that is consistent with the needs of your institution
- Clearly define what your intervention
- Develop a patient education program with the goal of providing consistent, structured education to patients
- Create guidelines for patient management to standardize care across your AMS
- Use comprehensive software such as DAWN AC DOAC modules to support your intervention and report your results
- Train and educate your staff!
- Don’t over manage DOAC patients
Pilot Testing

- Conducting a pilot can help you:
  - Establish the target population that works best for your anticoagulation service
  - Determine if you are ready for full scale implementation
  - Make decisions on where to allocate your time and resources
  - Ensure that you are well prepared to measure the success of your program
  - Establish an evidence-based program that meets the needs of your institution
Summary

- The use of DOACs has been increasing at a rapid pace nationwide.
- They don’t require routine monitoring but they are high risk medications
- There is an important need for AMS in the management of patients on DOACs
- Your DOAC clinic should be tailored towards your institution’s needs
- Creating policy and procedure is key in standardizing care for patients using DOACs
Brigham and Women’s Hospital
Anticoagulation Management Service

Thank you!

Questions?