Evaluation of a pharmacist direct oral anticoagulant (DOAC) monitoring service

Priya Verma PharmD
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Priya Verma, PharmD
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The speaker has no actual or potential Conflict of Interest in relation to this presentation.
Anticoagulation Clinic Background

- Pharmacist led clinics
- 9 Clinics total
- Study was piloted in two clinics
  - Piloted clinics monitor 3500 patient visits/year
BACKGROUND
Oral Anticoagulants (OACs) ¹

Warfarin:
- Competitively inhibits VKORC1
- Dosing is patient specific to target a goal INR
- Can be used in renal dysfunction and obese patients
- Many drug and food interactions

DOACs
- Reversibly inhibits factor Xa or thrombin
- Set dosing based on renal function and indication
- Not studied well in patients with renal dysfunction or obese patients
- Fewer drug interactions present
<table>
<thead>
<tr>
<th>Condition</th>
<th>Apixaban</th>
<th>Rivaroxaban</th>
<th>Edoxaban</th>
<th>Dabigatran</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-valvular atrial fibrillation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Venous Thrombosis</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Venous Thrombosis Following a Total Hip or Knee Arthroplasty</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Only Total Hip</td>
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## DOAC Misconceptions

<table>
<thead>
<tr>
<th>Misconception</th>
<th>Reality</th>
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<tbody>
<tr>
<td>“DOACs are easy”</td>
<td>• Dose adjustments are often not well understood and not done</td>
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<td></td>
<td>• Transitions within oral anticoagulants is complicated</td>
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<tr>
<td>“No monitoring is needed”</td>
<td>• Renal and hepatic monitoring is required for dose adjustments</td>
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<tr>
<td></td>
<td>• CBC is required to assess bleeding</td>
</tr>
<tr>
<td>“No drug or food interactions”</td>
<td>• Fewer interactions than warfarin, though still present</td>
</tr>
<tr>
<td>“Easy for patients”</td>
<td>• Cost and adherence is often a barrier</td>
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</table>
Switching Between OACs

Warfarin → DOAC
- Stop warfarin and start DOAC when INR below threshold

DOAC → DOAC
- Start new DOAC when next dose of previous DOAC was scheduled

DOAC → Warfarin
- Stop DOAC and begin parenteral anticoagulation + warfarin
Monitoring Parameters for DOACs

- No routine coagulation testing
- Recommended Labs:
  - Complete Blood Count (CBC)
  - Serum creatinine (SCr)
  - Liver function tests (LFTs)
DOAC Monitoring

- Dosing errors
- Renal dysfunction
- Adherence
- Preventable clots and bleeds
- Periprocedural management
Pharmacist DOAC Clinics Primary Literature

- **Design**
  - Single center, retrospective, observational, matched cohort analysis

- **Outcomes:**
  - Primary: Percentage of patients with appropriate DOAC therapy at baseline and 3-6 months
  - Secondary: Mean medication possession ration (MPR)

- **Results:**
  - Primary: More appropriate DOAC and dose compared to usual care (93% vs 79.1, p=0.009)
  - Secondary: The mean MPR was 91.8% vs 79.3% (p=0.0014)
Pharmacist DOAC Clinics Primary Literature

- **Design**
  - Retrospective chart review

- **Outcomes:**
  - Total number of potential patients reviewed
  - Total number of patients switched to a DOAC

- **Results:**
  - A total of 539 patients were identified with 87 patients seen in the anticoagulation clinic
  - A total of 74.7% patients were switched to a DOAC
  - Remaining patients either refused DOAC therapy or had a relative contraindication to a DOAC
### Pharmacist DOAC Clinics Primary Literature 3-4

<table>
<thead>
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<tbody>
<tr>
<td><strong>Design</strong></td>
<td>• Continued follow up</td>
<td>• Single visit with a 2 week telephone follow up</td>
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<tr>
<td></td>
<td>• Included new and follow up DOAC patients</td>
<td>• Included only non-valvular atrial fibrillation patients on warfarin</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td>• Percentage of patients on appropriate DOAC therapy</td>
<td>• Number of patients reviewed and transitioned to a DOAC</td>
</tr>
<tr>
<td></td>
<td>• Mean MPR</td>
<td></td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>• Greater percentage of patients on appropriate DOACs and dose</td>
<td>• Small portion of warfarin patients qualified to transition to a DOAC</td>
</tr>
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<td>• Higher MPR</td>
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### Published DOAC Clinic Designs

#### Option 1: Clinic Appointments
- 1 Month
- 3 Months
- 6 or 12 Months
- Every 6-12 Months

#### Option 2: Phone Appointments
- 1 Month
- 3 Months
- Every 3-12 Months

#### Option 3: Phone and Clinic Appointments
- 2 Weeks
- 3-6 Months
- Every 3-6 Months PRN
Self Assessment Question #1

Due to insurance coverage, a patient needs to be switched from apixaban to rivaroxaban for non-valvular atrial fibrillation. Please select the appropriate transition.

A. Overlap apixaban and rivaroxaban for at least 3 days
B. Discontinue apixaban and initiate rivaroxaban when the next dose of apixaban would be due
C. Stop rivaroxaban and initiate apixaban 6 hours later
D. None of the options are correct
A patient presents to the anticoagulation clinic for DOAC monitoring, and is wondering which labs she needs to get done. What would be an appropriate response?

A. CBC and CMP
B. CBC and PT/INR
C. CMP and aPTT
D. aPTT and PT/INR
PARKVIEW DOAC MONITORING SERVICE
Workflow

- Adherence Check
- CMP + CBC
- Adherence Check

4 Week

3 Month

- CMP + CBC
- Adherence Check

6 Month

- CMP + CBC
- Adherence Check

Every 6 or 12 Months

Started service 11/2019
New Service Outreach

• Reviewed all current warfarin patients with a time in therapeutic range (TTR) <50%
• Provided education to the providers and clinical staff members regarding new service
Study Design

• Purpose:
  • Review the impact of a pharmacist DOAC monitoring service

• Methods:
  • Retrospective chart review
Inclusion/Exclusion Criteria

**Inclusion**
- FDA approved DOAC indication
- CrCl >30 mL/min
- Child-Pugh Class A or better

**Exclusion**
- BMI >50
- Pregnant or breastfeeding
- Hemodialysis
Endpoints

• Primary:
  • Evaluate the number of patients managed on DOAC therapy

• Key secondary:
  • Number of patients requiring dose adjustments
  • Number of patients transitioned back to warfarin
  • Patient adherence
  • Safety events
Results

Possible Patients (n=519)

Potential Patients (n=83)

Not FDA indication (n=218)
No longer ATU patient (n=62)
No longer on warfarin (n=36)
Not a Parkview provider (n=26)
Renal impairment (n=22)
Already on a DOAC (n=22)
BMI >50 (n=21)
TTR >50% (n=16)
Previously Tried DOAC (n=13)

Provider Refused (n=10)
Patient Refused (n=11)
Awaiting Provider Response (n=28)
Awaiting Patient Response (n=24)

DOAC Patients (n=10)

Potential DOAC Patients

Ineligible Patients (n=519)
Results

Primary:
- Total patients (n=16)
  - Clinic initiated (n=15)
  - Provider initiated (n=1)

Secondary:
- Dose adjustments required (n=1)
- Transitioned back to warfarin (n=1)
- Safety events (n=1)
Discussion- Strengths

• Develop and implement a new service
• Provided education to pharmacy team and providers
• Utilize care management team
Discussion- Limitations

• Small sample size
• Patient specific barriers
• Therapy specific barriers
• Health system specific barriers
Next Steps

- Continue to identify and monitor DOAC patients
- Increase awareness of new service
- Updating workflow based on feedback
Conclusions

• Monitor CBC, SCr, and LFTs while on DOACs
• DOAC clinics are starting to emerge and various clinic designs have been published
• The Parkview DOAC clinics have been able to identify potential patients and continue to monitor labs to ensure appropriate dose and adherence
References


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