

Implementation of Pharmacist-Led Quality Initiative for Direct Oral Anticoagulant (DOAC) Monitoring

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Conflict of Interest Disclosure

Presenter does not have any relevant financial relationships or conflicts with the content of the presentation.



Objectives

1. Explain the development and workflow process of a pharmacist-based DOAC monitoring program within a health system
2. Identify the gaps in care and barriers for DOAC management
3. Describe the intervention types found with the pharmacist-based DOAC monitoring program





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1. Are any of the audience members currently working or have worked at an institution that had pharmacist-led anticoagulation programs?

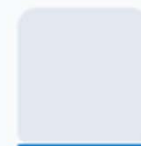
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Yes

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No

Development and Workflow of Pharmacist-Based Direct Oral Anticoagulant Monitoring Program



Pharmacist-Led Anticoagulation Management

- Improved time in therapeutic range for warfarin patients
- Improved patient satisfaction and education
- Increased adherence
- Decreased thromboembolic and bleeding complications

Haché J, Bonsu KO, Chitsike R, Nguyen H, Young S. Assessment of a pharmacist-led direct oral anticoagulant monitoring clinic. *Can J Hosp Pharm.* 2021; 74(1):7-14.

Hou K, Yang H, Ye Z, Wang Y, Liu L, Cui X. Effectiveness of pharmacist-led anticoagulation management on clinical outcomes: a systematic review and meta-analysis. *J Pharm Pharm Sci.* 2017;20(1):378-396.

Perlman A, Horwitz E, Hirsh-Racah B, *et al.* Clinical pharmacist led hospital-wide direct oral anticoagulant stewardship program. *Isr J Health Policy Res.* 2019; **8**: 19.

Young S, Bishop L, Twells L, Dillon C, Hawboldt J, O'Shea P. Comparison of pharmacist managed anticoagulation with usual medical care in a family medicine clinic. *BMC Fam Pract.* 2011;12:88.

Witt DM, Sadler MA, Shanahan RL, Mazzoli G, Tillman DJ. Effect of a centralized clinical pharmacy anticoagulation service on the outcomes of anticoagulation therapy. *Chest.* 2005;127(5):1515-22.



Roles of Pharmacists in Anticoagulation

Improving
adherence

Optimizing
treatment

Improving
safety

Supporting
transition of
care

Smythe MA. Advances in anticoagulation management: the role of pharmacy. *Ann Pharmacother*. 2007;41(3):493-495.

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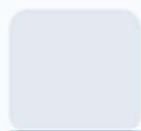
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2. Having a pharmacist-led anticoagulation management program has shown to:

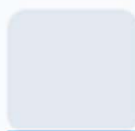
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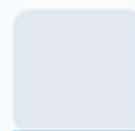
Decrease thromboembolic and bleeding complications

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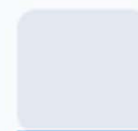
Increase costs to the healthcare system

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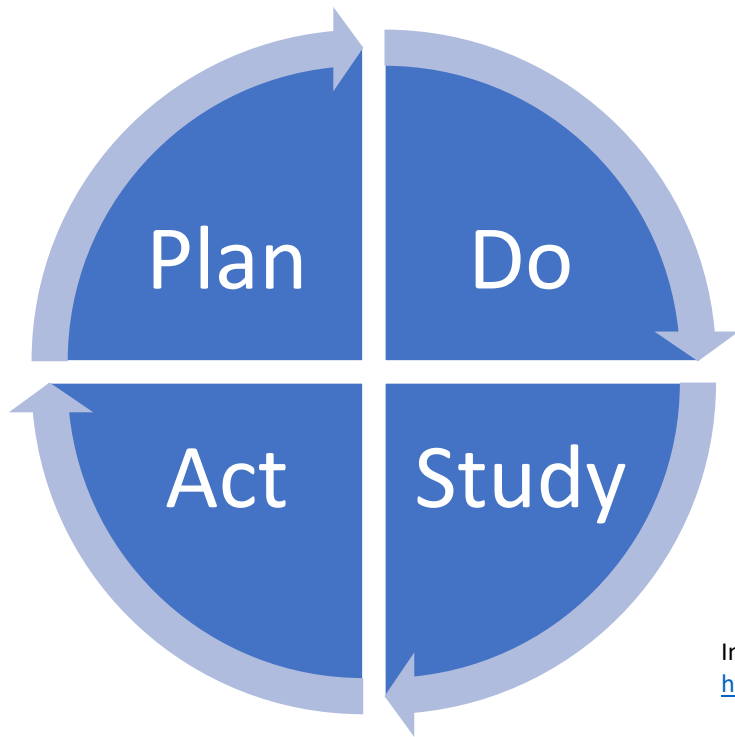
Reduce provider workload

0%



Eliminate hospitalizations

Model for Improvement: PDSA



Plan: Test/observation and collecting data

Do: Perform the test/observation

- Document issues and unexpected observations
- Initiate data analysis

Study: Analyze data

- Compare results to predictions

Act: Based on information learned from test/observation, fine-tune the process by determining what adjustments need to be made

- Create a plan for the next test

Institute for Healthcare Improvement . How to improve- science of improvement: testing changes. Available at: <https://www.ihp.org/resources/Pages/HowtoImprove/ScienceofImprovementTestingChanges.aspx>. Accessed June 16, 2023.



Anticoagulation Stewardship Team

- Consists of:
 - Pharmacists
 - Anticoagulation Management Services manager
 - Anticoagulation Nurse Educator
 - Project Managers
 - Cardiology and primary care physicians
 - Clinical and Business Intelligence (CBI) Developers
 - EPIC Information Technology Developers





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3. Which of the following statements is correct?

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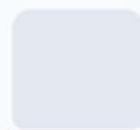
PDSA stands for plan-demonstrate-study-act

0%



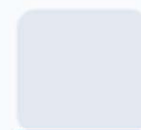
PDSA stands for plan-do-study-act

0%



PDSA stands for perform-do-study-act

0%



PDSA stands for perform-do-strategize-act

Plan

- Objective: To create a pharmacist-led anticoagulation program that will assist with standardizing care, improving adherence, and optimizing treatment
- Predictions: Development of this program will standardize care, improve adherence, and optimize anticoagulation treatment



Plan

Plan:

- Workflow between pharmacists and providers

Pharmacists will:

Chart reviews	Review	Provide	Collaborate
<ul style="list-style-type: none">• Initial and annual• Appropriateness of DOAC therapy	<ul style="list-style-type: none">• Labs• Hospitalization records	<ul style="list-style-type: none">• Patient education• Perioperative DOAC recommendations• Anticoagulation transitions	<ul style="list-style-type: none">• Provider• Social work• Prescription assistance

Plan: Program Builds

- DOAC Pharmacists work pool
 - In-basket messages alerting :
 - New, refill, or renewal prescriptions of any DOAC has been placed
 - Patients with DOAC flags who have been hospitalized within our hospital system
 - Patients with DOAC flags who have renal, liver, or complete blood count (CBC) labs done
 - DOAC flag
 - Placed on charts that have been reviewed
 - Used in tracking patients reviewed, used to fire off in-basket messages listed above



Plan: Tracking Data

- CBI developed a DOAC Dashboard
 - Tracks total number of prescriptions of DOACs within our health system
 - Number of patients with DOAC flags (intake review occurred)
 - Larger-scale trends:
 - Number of patients on antiplatelets, non-steroidal anti-inflammatory medications, cytochrome P (CYP) or P-glycoprotein (P-gp) inhibitors/inducers
 - Number of patients with abnormal creatinine, total bilirubin, hemoglobin, hematocrit
 - Individual patients with any issues such as abnormal labs or interacting medications highlighted
- Pharmacists also track interventions via excel



Do: Initial and Annual Chart Intake Assessment

- Review for appropriateness of:
 - Indication
 - Dose
 - Drug-drug interactions
 - Renal and liver function
 - Weight and BMI
 - Contraindications (example: mechanical valve replacements)
 - Lab safety monitoring frequencies
 - Existing provider perioperative recommendations
 - Cost affordability issues



Monitoring of Direct Oral Anticoagulants

	Healthy patients	Renal Impairment (eGFR <60ml/min)	Elderly (age ≥ 75 years)	Liver impairment (Child-Pugh B or C)	Concomitant drugs (PGP or CYP3A4 inhibitors/inducer ^{1,2} , NSAIDs, antiplatelets ³)
Complete Blood Count (CBC)	Baseline and annually	Baseline and at least annually.	Baseline and at least annually	Baseline and at least every 6 months	Baseline and every 3 to 6 months
Renal Function	Baseline and every 6-12 months	Baseline and every 3 to 6 months	Baseline and every 3 to 6 months	Baseline and at least every 6 months	Baseline and every 3 to 6 months
Hepatic Function	Baseline and annually	Baseline and annually	Baseline and annually	Baseline and at least every 6 months*	Baseline and annually

Conway SE, Hwang AY, Ponte CD, Gums JG. Laboratory and clinical monitoring of direct acting oral anticoagulants: what clinicians need to know. *Pharmacotherapy*. 2017; 37: 236-248.

Gladstone DJ, Geerts WH, Douketis J, et al. How to monitor patients receiving direct oral anticoagulants for stroke prevention in atrial fibrillation: a practice tool endorsed by thrombosis Canada, the Canadian Stroke Consortium, the Canadian Cardiovascular Pharmacists Network, and the Canadian Cardiovascular Society. *Ann Intern Med*. 2015;163(5):382–5.

Kearin C, Akl EA, Comerota AJ, et al. Antithrombotic therapy and prevention of thrombosis. 9th ed: American college of chest physicians evidence-based clinical practice guidelines. *Chest*. 2016; 141 (2): e419S-e496S.

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Gaps in Care and Barriers

Financial

- Cost affordability assessment not done *prior* to drug initiation
- Coverage gaps (ex: donut hole)

Care at multiple facilities

- Initiation of interacting drugs
- Duplicate or conflicting instructions provided to patient

Gaps in Care and Barriers

Education

- Limited time in provider-patient office visits
- Some important topics not discussed:
 - Importance of avoiding missed doses
 - How to take the drug
 - How to handle upcoming procedure or surgeries



Gaps in Care and Barriers

Drug-drug interactions

Lab monitoring and dosing

- Lack of exact lab frequencies outlined by guidelines
- Large variation amongst how providers were managing lab monitoring
- Patients are unaware of the importance of labs while on the DOAC

Laboratory and Clinical Monitoring of Direct Acting Oral Anticoagulants: What Clinicians Need to Know. *Pharmacotherapy* 2017;37:236-48.



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Gaps in Care and Barriers

Resumption post-bleeding or post-procedure

- Lost to follow-up
 - Delay in resumption

Weight and BMI considerations

- Lack of risks versus benefits discussions on DOAC use in morbidly obese BMI or weight

Gaps in Care and Barriers

Switching from warfarin to DOAC

- Unfamiliarity with INR requirements by providers
 - Could lead to inappropriately overlapped anticoagulation

Dosing

- Under: didn't meet at least 2 characteristics for apixaban 2.5mg twice daily for AFIB
- Over: development of renal impairment that requires a dose reduction



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4. Which of the following is a gap in care or barrier identified in the presentation of direct oral anticoagulant therapy

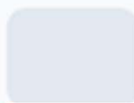
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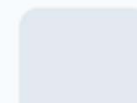
Patient preference

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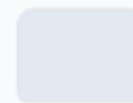
Delay in resumption of direct oral anticoagulant after bleeding or post-procedure

0%



Time

0%



None of the above

Discussion

What are some barriers you see in your practice with direct oral anticoagulation management?



Do-Study-Act: Problem With Refills on Late Labs

Cardiology and
Medication Refill
Center Lab
Conflicts

- Internal refill protocol: just need complete blood count (CBC) and complete metabolic panel (CMP) annually
- DOAC program: lab frequencies depending on patient characteristics

Collaborated
with
departments

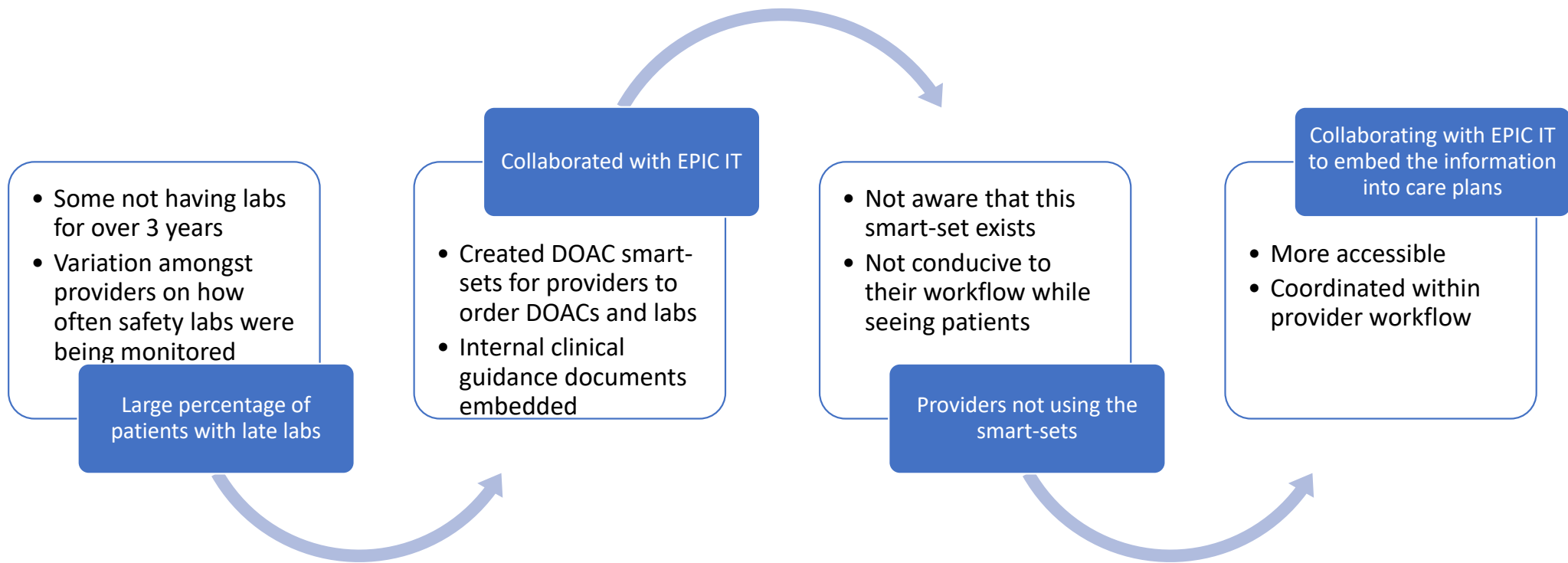
- Other departments' DOAC refill protocol now aligns with DOAC program lab monitoring

Pharmacists add
lab frequencies
into DOAC flag
comments

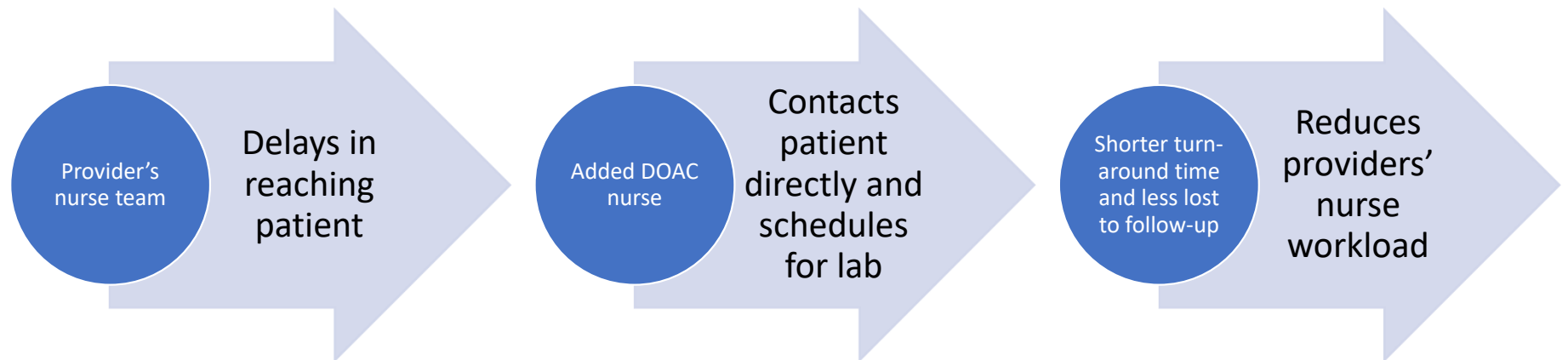
- Lab frequencies easily accessible in patient charts for all users
- Lab monitoring standardized

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Do-Study-Act: Problem with Unstandardized Monitoring

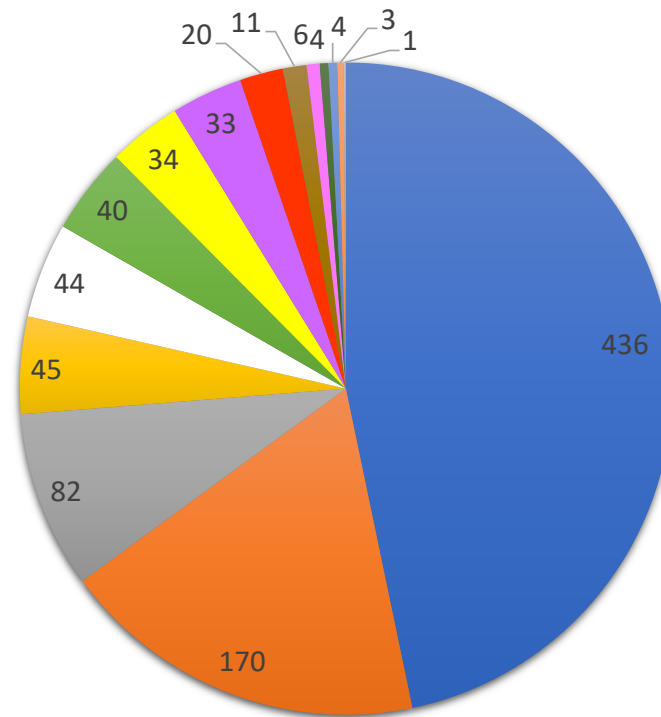


Do-Study-Act: Delays in Patients Getting Safety Labs Done



Intervention types found with the pharmacist-based direct oral anticoagulant monitoring program





- Late labs/ labs due
- Perioperative consults
- Removal of DOAC from medication list
- Perioperative interventions
- Updated non-DOAC medications on list
- Ordering future labs
- Education
- Recommended change to warfarin
- Adding DOAC back onto medication list
- Recommended change to different DOAC
- Indication missing
- Dose
- Length of therapy
- Drug-drug interactions
- Adherence issues



Length of Therapy (2.1%)

Venous thromboembolism
treatment completed (90%)

Risk factors removed following
provoked event (10%)

Indications (9.8%)

AFIB or venous
thromboembolism missing from
problems list
-AFIB: 97%
-VTE- 3%

Dose (4.3%)

- Increasing dose due to the patient not meeting at least 2 factors for atrial fibrillation (32%)
- Reducing dose due to the patient meeting at least 2 factors for atrial fibrillation (25.5%)
- Reducing dose for VTE recurrence prophylaxis (2.5%)
- Reducing dose due to renal function (30%)

Dose

- Patient inappropriately taking dose (5%)
- Missed intensive dose for VTE treatment (2.5%)
- Inappropriately long intensive dose: (2.5%)

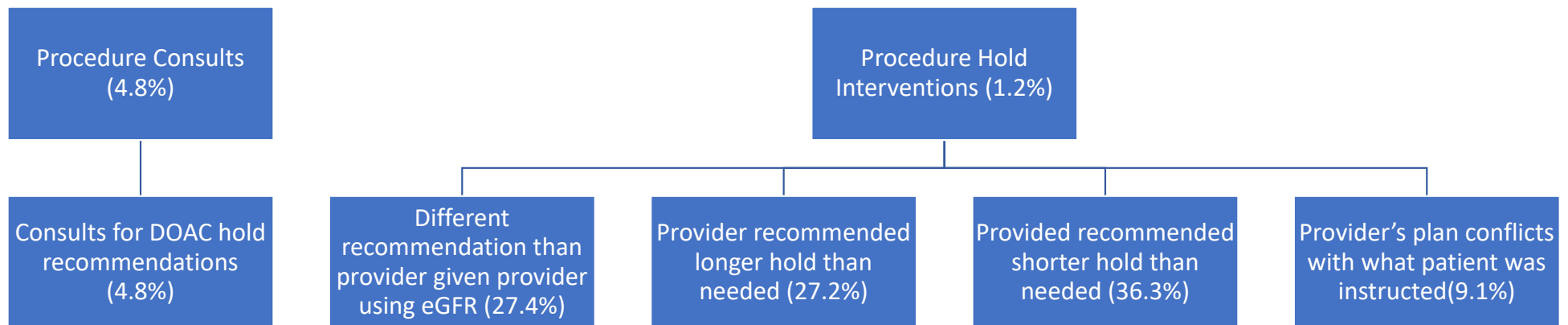


Late Labs

CBC, renal function,
or liver function
labs late (46.8%)

Ordering Future Labs

Ordering labs due
within the next 3
months (18.2%)





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5. Which was the most common pharmacist intervention in the direct oral anticoagulant program?

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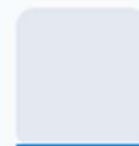
Missing indications

0%



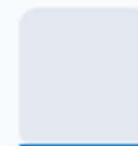
Procedure consults

0%



Late labs

0%



Incorrect dose

Removal of DOAC From Medication List (3.6%)

- Patient was instructed by provider to stop medication: 64.7%
- Duplicate scripts with 2 different doses: 35.3%

Recommended Alternative Warfarin (3.5%)

- Poor renal function, no longer qualified for DOACs: 42.4%
- Major interaction with CYP inducer: 6.1%
- BMI exceeding 50 or weight exceeding 180kg: 48.5%
- Gastric bypass surgery that affected absorption of DOAC: 3%

Updated Medication
List for Non-
anticoagulant
Medications (0.4%)

- Removal of non-steroidal anti-inflammatory medications after education: 50%
- Removal of major interacting medication patient was no longer on: 50%

Adding DOAC Back
Onto Medication List
(0.6%)

- Surgeon only intending for temporary hold: 33.3%
- DOAC on hold after bleed and resumed after pharmacy prompting re-evaluation: 66.7 %

Phone Education (4.7%)

- New DOAC initiation

DOAC Booklets

- Initiated within the last 12 months

MyChart Patient Message

- All patients signed up for MyChart communication



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6. Which of the following was an example of PDSA that the program came across?

0

0%

Patients were not accessing the provided educational material which led to a collaboration with IT

0%

Providers were not responsive to pharmacist interventions which led to a hard-stop alert being built

0%

Safety lab monitoring was unstandardized which led to a collaboration with IT team to create a smart-set with clinical guidelines embedded in it for provider use

0%

Patients did not trust the pharmacists

Discussion

What are the most impactful or common interventions you have seen or done so far with direct oral anticoagulants?



Pharmacist-Led Anticoagulation Program

- Objective: To create a pharmacist-led anticoagulation program that will assist with standardizing care, improving adherence, and optimizing treatment for DOAC use
- Standardize care:
 - Safety lab monitoring and refills
 - Perioperative management
- Improving adherence:
 - Education- correct dosing
- Optimize treatment:
 - Revise dosing errors, inappropriate perioperative plans, choice of anticoagulant, dosing for VTE recurrence prophylaxis, length of therapy, drug-drug interactions





< 095 - Vuu - Implementation of Pharmacist-Led Quality

Moderate

Visual settings

Edit



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Questions?

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Nobody has responded yet.

Hang tight! Responses are coming in.

References

- Haché J, Bonsu KO, Chitsike R, Nguyen H, Young S. Assessment of a pharmacist-led direct oral anticoagulant monitoring clinic. *Can J Hosp Pharm*. 2021; 74(1):7-14.
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