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Evaluating the Appropriateness of Vitamin K (phytonadione) Usage for Reversing an Elevated International Normalized Ratio Secondary to Warfarin Therapy

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Background

- Despite the emergence of direct oral anticoagulants (DOACs), warfarin continues to be a frequent medication of choice for anticoagulation.¹
- The effects of warfarin, a vitamin K antagonist (VKA), can be reversed with exogenous vitamin K. Supratherapeutic warfarin therapy can lead to major bleeding events if left uncorrected.¹
- Guidelines recommended use of vitamin K to reverse warfarin therapy based on INR level and presence of patient bleeding.²

Objective

- To examine and evaluate the appropriateness of vitamin K (phytonadione) use at the Providence VA Medical Center (PVAMC) when administered orally or intravenously for the purpose of reversing an elevated international normalized ratio (INR) caused by warfarin therapy.
- The primary outcome was the rate of adherence to the 2012 CHEST guidelines.²

Methods

- Study design: retrospective electronic chart review
- Vit K administration deemed appropriated if:
 - INR was between 4.5 and 10 with evidence of bleeding OR
 - INR >10 with no evidence of bleeding OR
 - any warfarin-associated major bleeding
- This project was designated as exempt by the PVAMC institutional review board.

Inclusion criteria:

- Veterans admitted for any reason from January 1, 2017 – December 31, 2019
- active outpatient warfarin prescription at the time of vitamin K administration
- received vitamin K either orally or intravenously, at any dose or frequency

Exclusion criteria:

- prescribed a DOAC (ie. apixaban, dabigatran, edoxaban, or rivaroxaban)
- received vitamin K alone for any reason other than for warfarin reversal such as perioperative use
- hepatic disease (i.e. cirrhosis, hepatitis, etc.)
- contraindication to vitamin K such as allergy or anaphylaxis

Results

INR

- mean INR at the time of vit K administration: 4.9
- mean INR higher in the appropriate vs inappropriate administration group (6 vs 4.4, respectively).

Bleeding

- major and minor bleeding rates were 58% (n=11) and 21% (n=4) in the appropriate administration group and 0% (n=0) and 31% (n=16) in the inappropriate group, respectively.

Route of administration

- 53 (76%) oral doses and 17 (24%) parenteral doses
- mean INR higher for oral vs parenteral doses (5.2 vs 3.98, respectively)
 - oral vit K group: 10 (19%) major bleeds, 13 (25%) minor bleeds, and 30 (59%) no bleeds
 - parenteral vit K group: 3 (25%) major bleeds, 8 (36%) minor bleeds, and 6 (17%) no bleeds

Table 1. Clinical and demographic characteristics of enrolled patients at baseline

Characteristics	Appropriate vit K group (N=10)	Inappropriate vit K group (N=60)	Total (N=70)
Male sex, n (%)	19 (100)	47 (92)	66 (94)
Mean age, n	83.5	76.3	76.9
Afib, n (%)	17 (89)	38(75)	55 (78.6)
VTE, n (%)	2 (20)	9 (18)	11 (15.7)
Mechanical valve, n (%)	0 (0)	3 (0.05)	3 (0.04)

Figure 1. Inappropriate vs. appropriate vit K administration

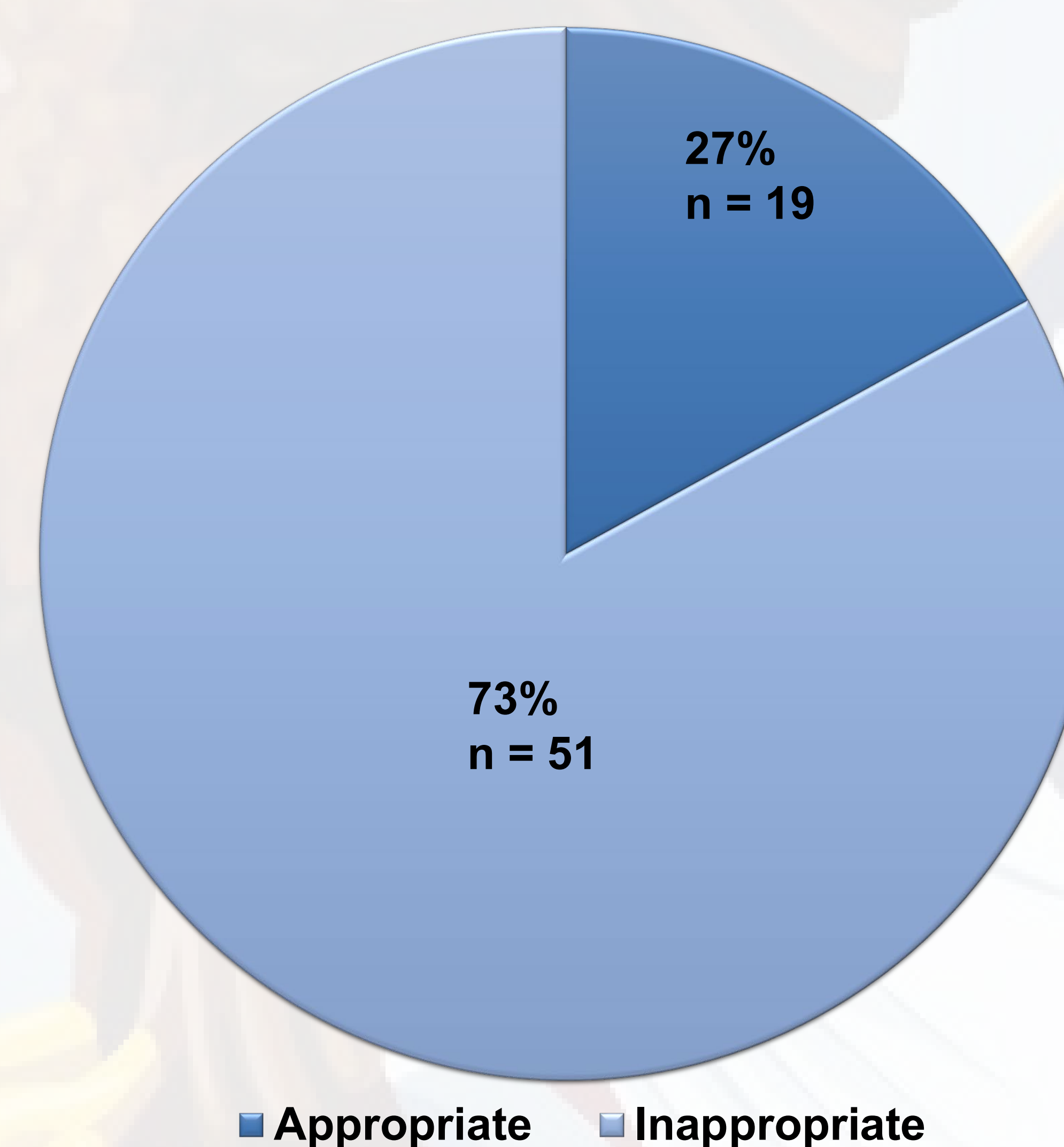
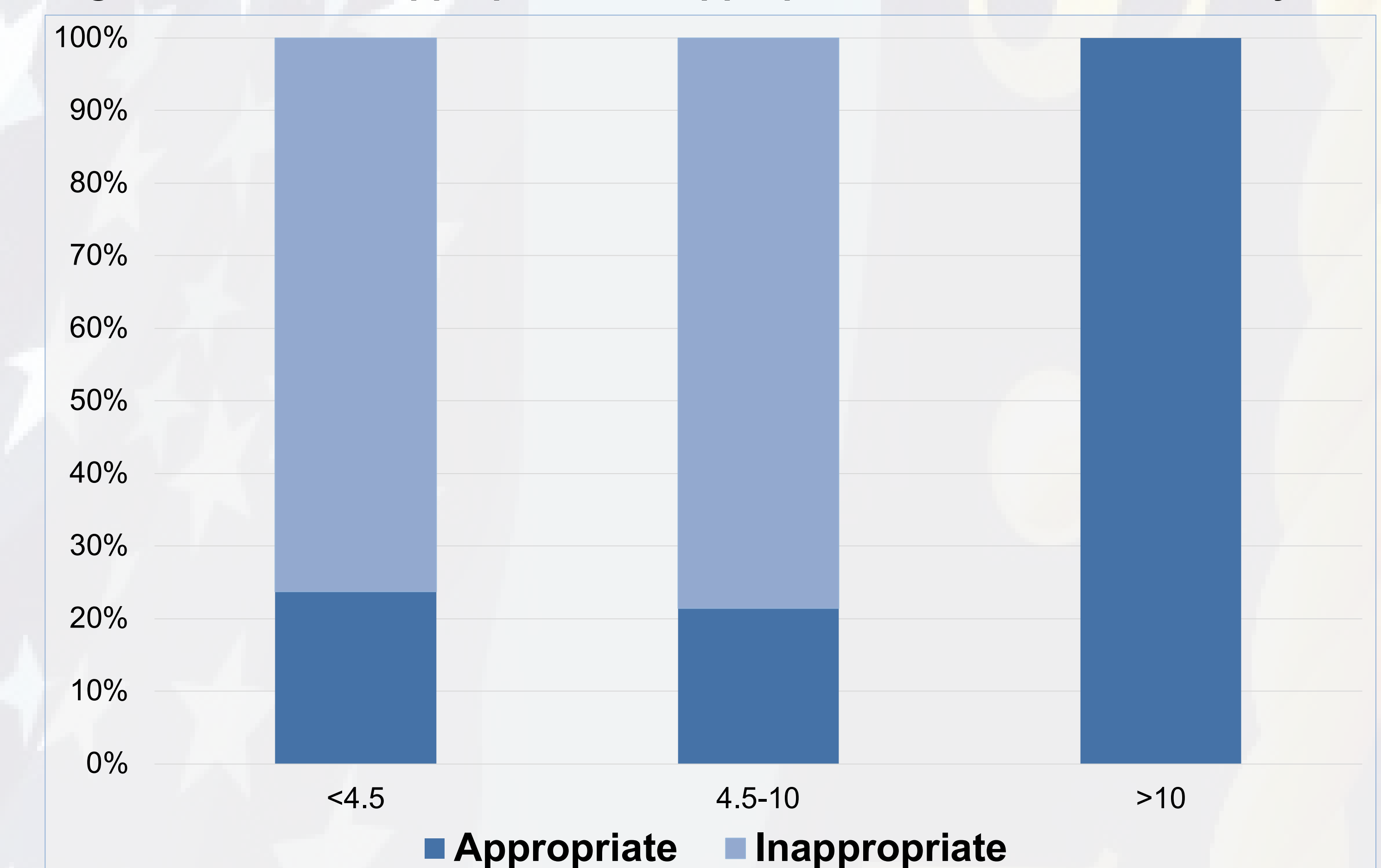
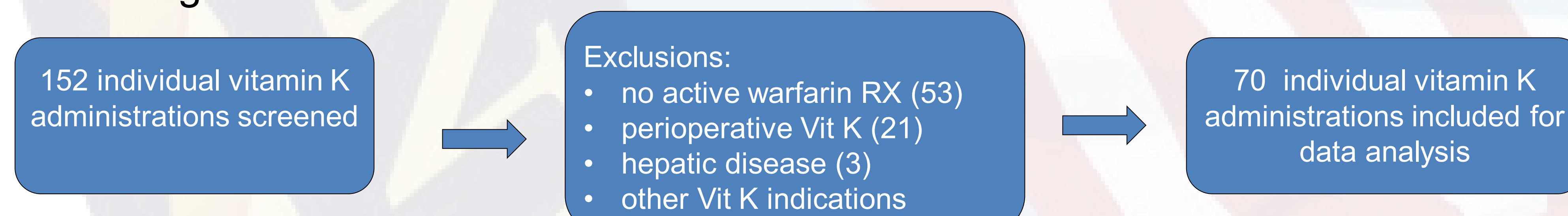


Figure 2. Rate of inappropriate and appropriate vit K administration by INR



Results

Screening Process



Conclusions

According to the 2012 CHEST guidelines, the majority of vitamin K doses administered and recorded for warfarin reversal at the PVAMC during the study period were found to be inappropriate. Strategies for improving appropriate use at this institution such as implementation of a vitamin K administration protocol and/or provider education should be explored. Further investigation is needed on vitamin K use in patients not prescribed warfarin for anticoagulation.

References

1. Hanley J. P. (2004). Warfarin reversal. *Journal of clinical pathology*, 57(11), 1132-1139.
2. Holbrook, A., Schulman, S., Witt, D. M., Vandvik, P. O., Fish, J., Kovacs, M. J., et al. (2012). Evidence-based management of anticoagulant therapy: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: CHEST Guidelines. *Chest*, 141(2 Suppl), e152S-e184S.