

Cost-Effectiveness Analysis of Patient Self-Management for Managing Warfarin in Patients with Non-Valvular Atrial Fibrillation in the US

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Introduction

- Warfarin has been a mainstay anticoagulant for decades because of its effectiveness and affordable price. Despite the advantages, warfarin administration is challenging due to its narrow therapeutic index and potential drug-drug and drug-diet interactions.¹
- Warfarin laboratory monitoring and dose adjustments ensure effectiveness and safety are traditionally performed by healthcare professionals.
- Patient self-management (PSM) allows patients to monitor and adjust warfarin use independently of direct clinician oversight.² It is associated with significantly decreased thromboembolic events and mortality. ^{3,4} PSM has been implemented in many countries but has not been widely adopted in the US.

Objective

To estimate the costs and outcomes of PSM compared with conventional strategies, including anticoagulation management services (AMS) and usual care (UC) for patients with non-valvular atrial fibrillation (NVAF) in the US from societal perspective.

Methods

A Markov model was developed to project lifetime costs and outcomes of patients with NVAF age of 70 years old from a societal perspective. The interventions of interest included PSM, AMS, and UC.



Figure 1. Schematic of the Markov model

- Transition probabilities were derived from the incidence of each event from patient-level data from 1,505 warfarin patients with NVAF at the University of Utah.
- Relative risks of events derived from a network meta-analysis were multiplied for other interventions.³

- Direct medical costs consisted of monitoring and clinic visit costs, event treatment costs, and maintenance costs after the event.
- Direct non-medical costs included transportation to the clinic.
- Cost for events was obtained from HCUP published data and the literature. Costs were adjusted and presented in 2022 USD.
- Utilities and disutilities due to events were obtained from published-studies conducted in US populations.
- One-way sensitivity analyses and probabilistic analyses were performed to determine the robustness of the findings.

Results

Table 1. Base case analysis demonstrated that PSM is cost-saving compared to both UC and AMS.

Intervention	Discounted Life years	Discounted QALY	Discounted Costs (\$2022)	Incremental QALY	Incremental Costs
Usual care	10.43	6.50	517,120	Refer	ence
Anticoagulation Management Service	10.44	6.54	508,798	-8,322	0.04
Patient self- management	10.46	6.85	447,708	-61,090	0.31



Figure 2. Probabilistic sensitivity analysis illustrating possible incremental cost (x-axis) corresponding with incremental QALY (y-axis) when varying every parameter within their possible range given the assumed distribution, simultaneously





Figure 3. Probabilistic sensitivity analyses revealed that the probability of PSM being cost-effective over a wide range of willingness-to-pay thresholds.

Methods (continued)

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- according to each setting.
- retirement age.
- This study has limitations, including:
 - prefer to continue using warfarin.⁵

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Discussion and Limitations

• PSM increases lifetime costs and patients' quality of life compared to other interventions as it reduces thromboembolic events by half and reduces subsequent long-term costs and outcomes.^{3,4} As a result, PSM was cost-effective at any willingness-to-pay threshold.

• The cost of PSM implementation consisted of first-time training. There are potentially hidden costs in the future, which should be considered

• Indirect costs were not included in the model as the population is in

• Direct oral anticoagulants (DOACs) were not included in the model. The current study focuses on care models for warfarin. Although DOAC use has been increasing, there are indications for which DOACs are not suitable, some patients cannot afford DOACs, and some patients

• Transition probabilities are obtained from only one site.

• The model assumes that the events are mutually exclusive and that patients can only have recurrent events after the event occurs and cannot experience other types of thromboembolic events.

Conclusion

• Overall, PSM appears to be cost-saving because it reduces

thromboembolic events leading to reduced long-term care costs.

Moreover, PSM requires less time of healthcare professionals.

• Although the trend of anticoagulation use is moving toward DOACs,

warfarin remains a preferred option for many patients.

• PSM is a valuable approach to optimizing warfarin care and should be considered for implementation in the US health settings.

References