

Impact of PharmaNet-based Admission Medication Reconciliation on Warfarin Best Possible Medication Histories

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Background

- Medication discrepancies commonly occur during hospital admissions due to inaccurate medication history documentation
- Medication Reconciliation (MedRec) is a process in which patients/caregivers are interviewed to obtain a Best Possible Medication History (BPMH) of home medications
- PharmaNet is an electronic database of all outpatient prescriptions dispensed in BC
- On Feb 27, 2012, St. Paul's Hospital implemented PharmaNet-based admission MedRec using a form that compiles the past 6 months of PharmaNet history
- Obtaining accurate BPMHs for warfarin can be challenging due to frequent dosage changes and non-specific directions on PharmaNet
- It is unclear whether PharmaNet-based admission MedRec has improved the quality of warfarin BPMH documentation and has reduced the rate of warfarin-related adverse events

Objectives

- Primary**
- To compare the rates of complete warfarin BPMH documentation (dose & frequency) before and after PharmaNet-based admission MedRec implementation
- Secondary**
- To compare the safety and efficacy of warfarin therapy before and after PharmaNet-based admission MedRec implementation by comparing the rates of major bleeding/thromboembolic events and the maintenance of INRs in therapeutic range
 - To compare the rates of complete warfarin BPMH documentation on MedRec forms in relation to the clarity of warfarin regimens recorded on PharmaNet
 - To determine associations between the rates of complete warfarin BPMH documentation and certain patient characteristics

Methods

- Study Design:** Retrospective chart review
- Inclusion Criteria:**
 - All patients ≥ 18 years old who were taking warfarin prior to admission and admitted to St. Paul's Hospital Internal Medicine service
 - Pre-implementation phase: Oct 1, 2009 to Feb 26, 2012
 - Post-implementation phase: Feb 27, 2012 to Jul 31, 2014
- Exclusion Criteria:**
 - Non-BC residents who did not have a PharmaNet profile
 - Discharged or transferred to another facility within 24 hours of admission
 - Admitted from another facility
 - PharmaNet-based admission MedRec not completed in the post-phase
 - Transferred to a critical care ward and/or received surgery during the admission
 - Admitted with a major bleeding or thromboembolic event
- Data Analysis:**
 - Pre-phase warfarin BPMH documentation defined as documentation on admission history note; post-phase warfarin BPMH documentation defined as documentation on admission history note and/or MedRec form
 - Chi-squared test for categorical data; Mann-Whitney U test for non-parametric continuous data

Figure 1: Flow Chart of BPMH Documentation Process at Admission

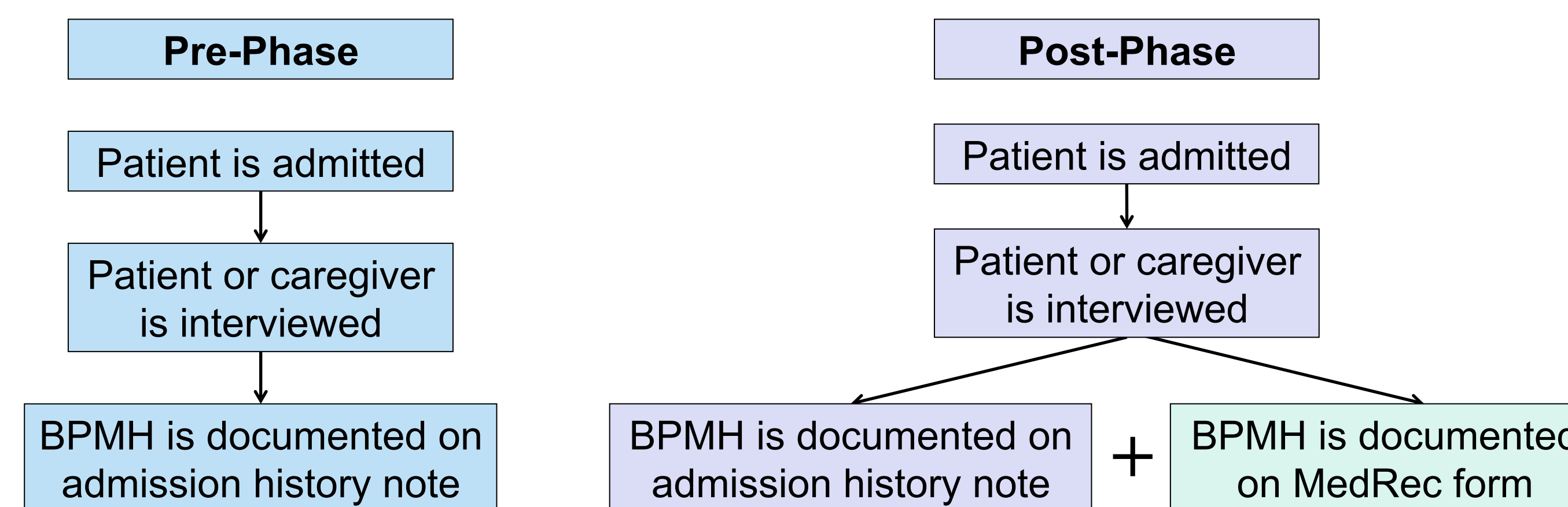


Table 1: Patient Characteristics

	Pre-Phase n = 100	Post-Phase n = 100
Age (years), median (IQR)	73 (63-84)	75 (67-83)
Male (%)	60	52
English speaking (%)	76	80
Number of home medications, median (IQR)	10 (7-13)	10 (7-13)
Primary warfarin indication (%)		
Atrial fibrillation	75	72
Venous thromboembolism	11	11
Mechanical valve replacement	10	12
Other	4	5

Results

Figure 2: Primary Outcome – Complete Warfarin BPMH Documentation

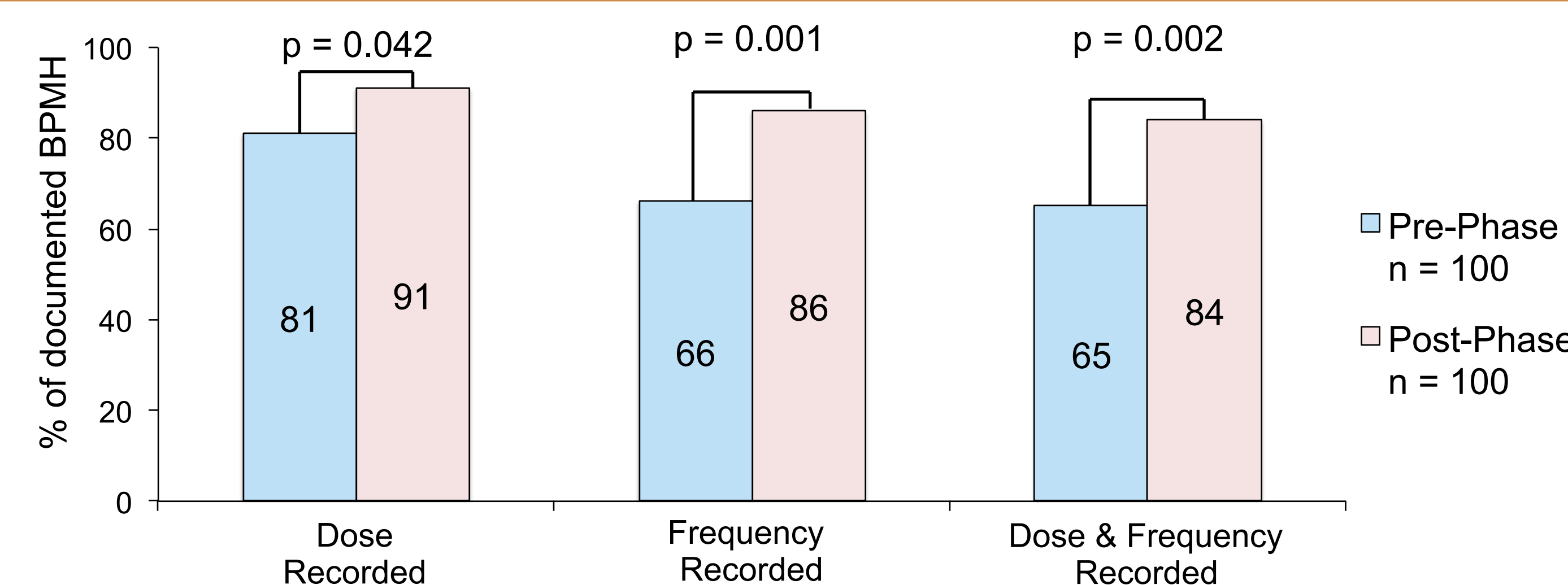


Figure 3: Association Between PharmaNet Clarity and Warfarin BPMH Documentation on MedRec Forms in Post-Implementation Phase (n = 100)

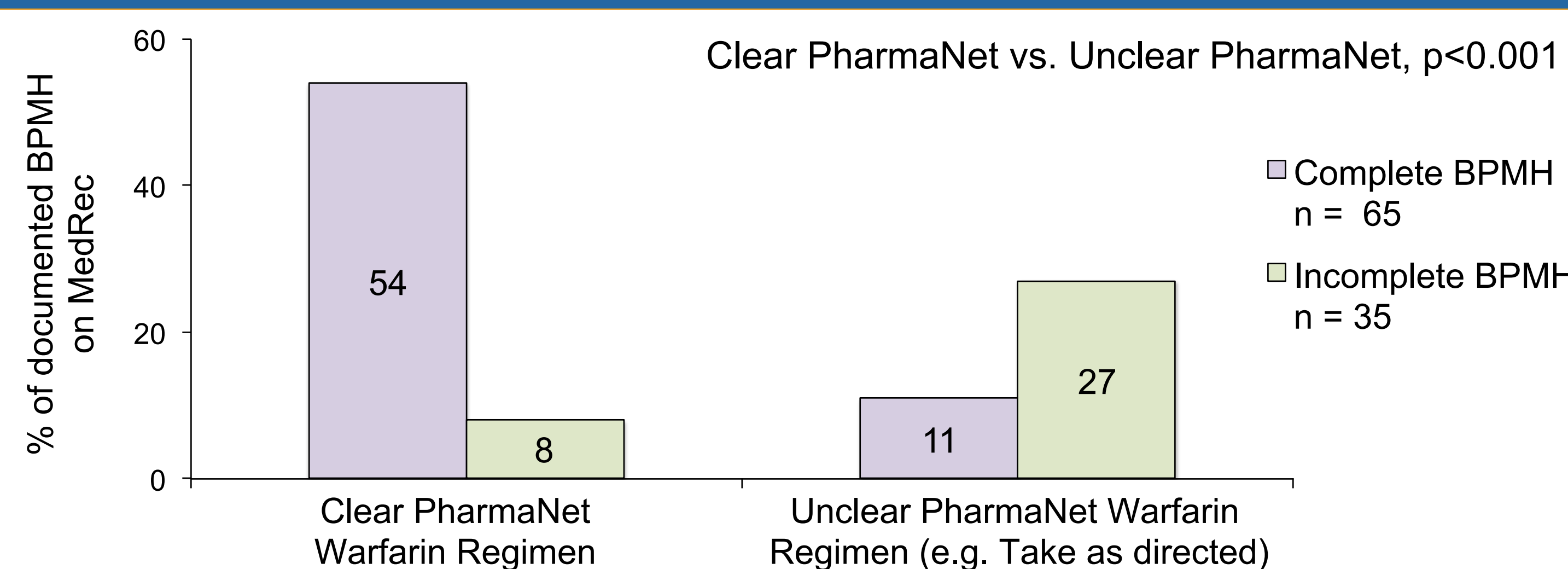


Figure 4: Complete Warfarin BPMH Documentation Rates Stratified by Patient Characteristics (n = 200)

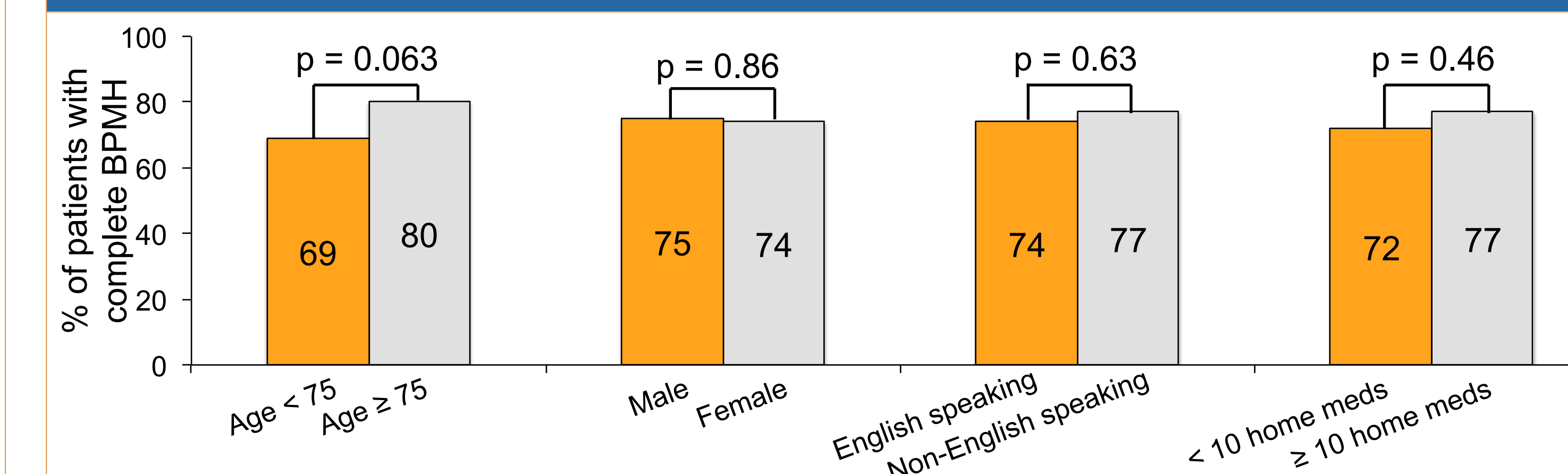


Table 3: Secondary Outcomes – Safety and Efficacy of Warfarin Therapy

	Pre-Phase n = 100	Post-Phase n = 100	p value
Clinical Outcomes			
≥ 1 major bleeding event (%)	2	1	0.56
≥ 1 thromboembolic event (%)	0	0	1.00
INR Analysis			
Percent time in therapeutic INR range during admission, median (IQR)	53 (20-74)	40 (17-64)	0.19
Admission INR outside therapeutic range (%)	48	58	0.16
Established a stable warfarin regimen that maintained therapeutic INRs during admission (%)	31	36	0.79
Time to establish a stable warfarin regimen that maintained therapeutic INRs (days), median (IQR)	3 (2-6)	4 (3-7)	0.29
Confounders			
Received medication that influences INR (%)	56	54	0.78
Received vitamin K (%)	14	13	0.84
Warfarin held during admission (%)	41	46	0.32

Limitations

- Single-centre, retrospective design with sample size of convenience
- Unable to verify accuracy of documented BPMH and of other chart data
- Clinical outcome data limited to events that occurred during the index admission

Conclusions

- Implementation of PharmaNet-based admission MedRec was associated with a statistically significant increase in rate of complete warfarin BPMH documentation
- No statistically significant difference was found in rates of major bleeding/thromboembolic events or percent time in therapeutic INR range with warfarin therapy before and after PharmaNet-based admission MedRec implementation
- In patients with admission INRs outside therapeutic range, implementation of PharmaNet-based admission MedRec did not appear to increase the likelihood of establishing a stable warfarin regimen that maintained therapeutic INRs or decrease the time required to establish such a regimen
- Compared to unclear warfarin regimens on PharmaNet, clear regimens were associated with a statistically significant increase in rate of complete warfarin BPMH documentation on MedRec forms
- No associations were found between rates of complete warfarin BPMH documentation and patient characteristics of age, sex, language, and number of home medications