



Outcome Analysis of a Pharmacist-led Warfarin Clinic

**Pharmacy Department,
Princess Margaret Hospital**

teamwork

teamwork

Primary Goal of the Clinic:

1. Optimize the anticoagulation control of Warfarin therapy
2. Decrease morbidity and hospitalization with reduced healthcare cost



PMH Pharmacist-led Warfarin Clinic Model

- Established in July 2006
- Referral by cardiologists only
- Referral criteria: on Warfarin without other chronic medications
- Regular follow-up by pharmacists
- 1-2 yearly reassessment by cardiologists

Responsibility of Warfarin Pharmacist

1. Monitor patient's anticoagulation control
2. Assess and evaluate:
 - Drug compliance level
 - Drug or food interaction
 - Patient's health status
 - Lifestyle changes
3. Renew and adjust Warfarin dosage according to protocol jointly developed with Cardiologists

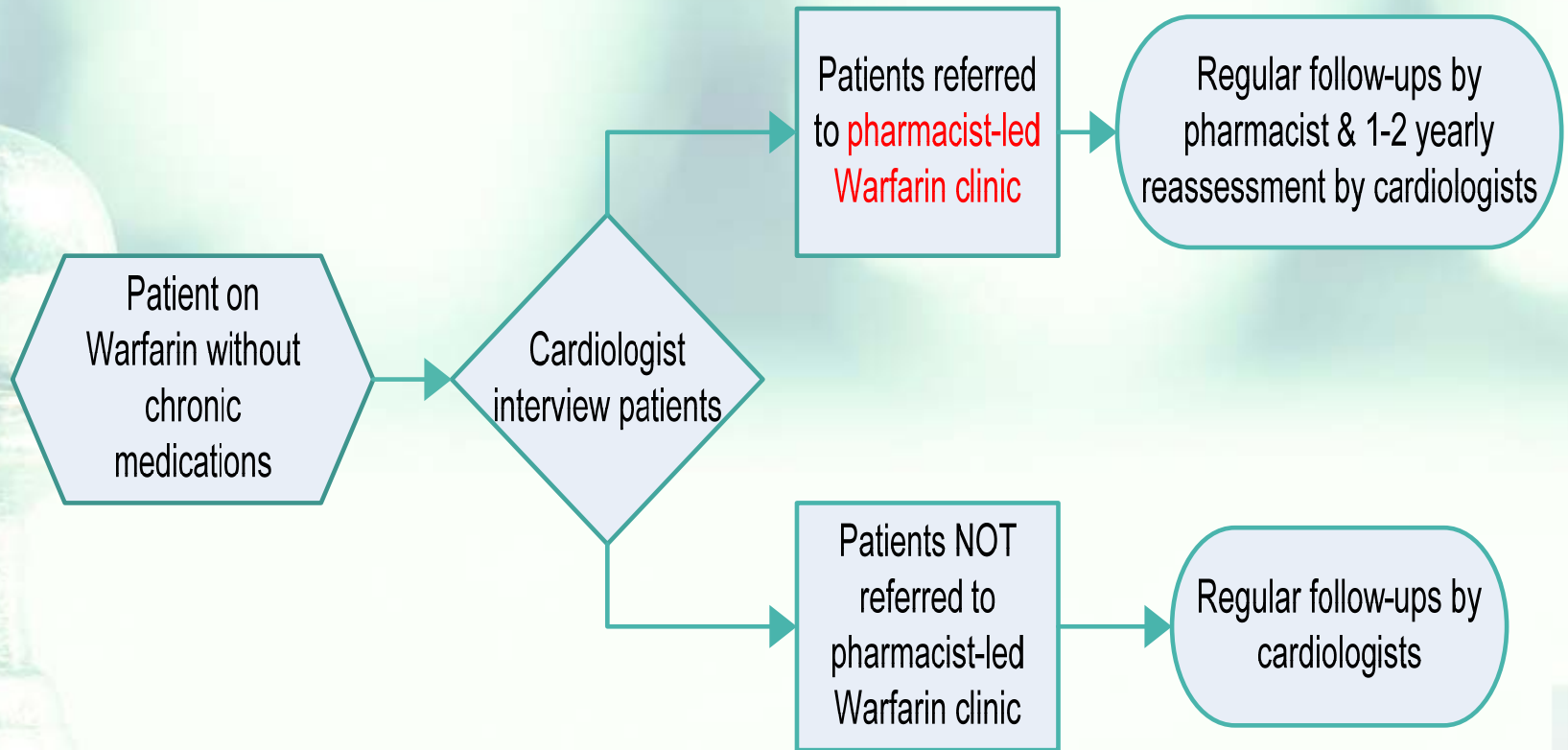


Responsibility of Warfarin Pharmacist

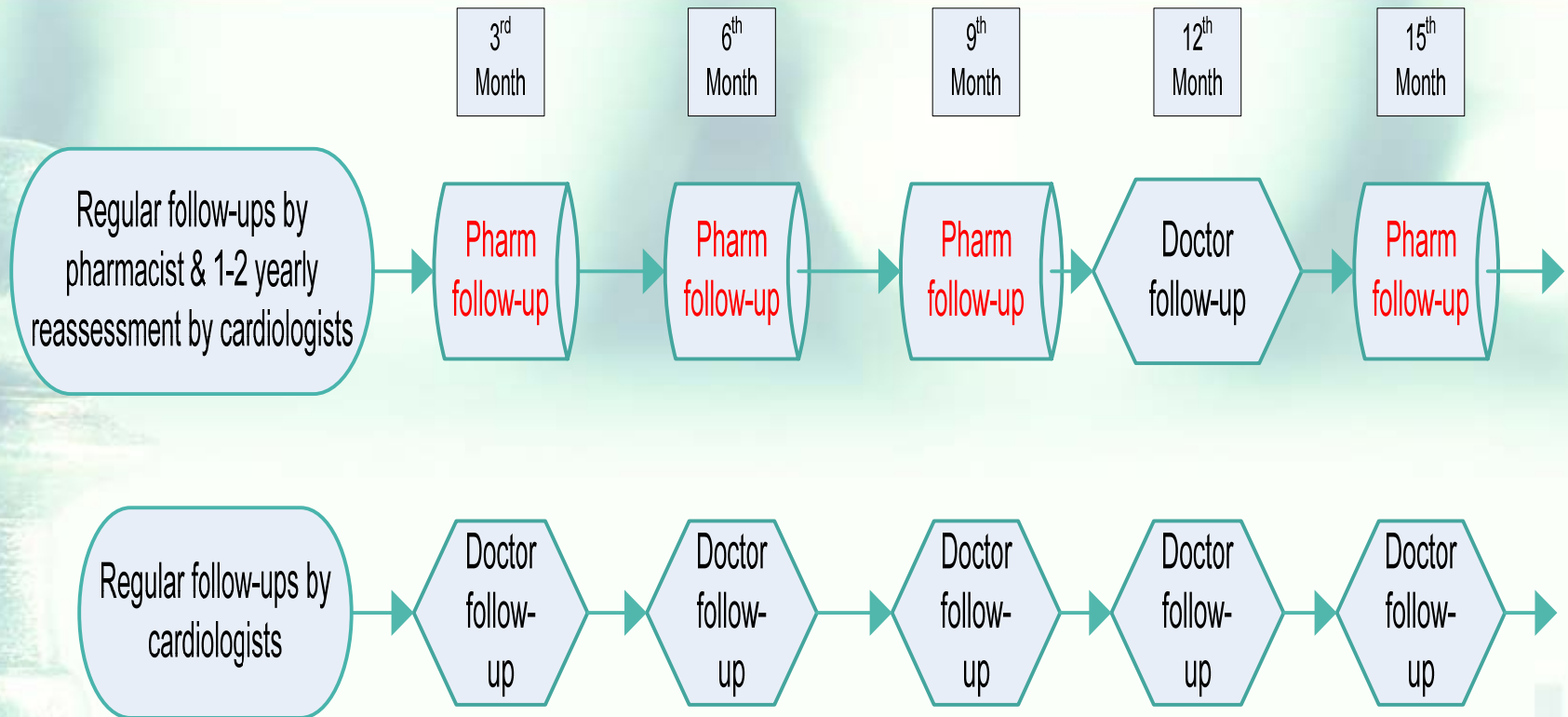
4. Order appropriate laboratory investigation (eg. Test for INR)
5. Provide education on Warfarin management
6. Arrange medical consultation for patients in special situations according to protocol



Study design



Study design



Outcome measures:

- Retrospective comparison of pharmacist-led VS cardiologist-led Warfarin groups on:
 - a. Anticoagulation control
 - b. Incidence of complications
 1. Major thromboembolic & haemorrhagic events
 2. A&E visits
 3. Hospitalisation
 - c. Patient's satisfaction on the service

Patient's demographics:

	Pharmacist-led	Cardiologist-led	p-value
1. No of patients	24	24	-
2. Age (mean \pm SD)	56.0 \pm 8.6	53.4 \pm 8.0	0.383
3. Sex	14(M) 10(F)	16(M) 8(F)	0.555
4. Target INR ranges:			
1.5 - 2.5	2	0	-
2 - 3	19	18	0.869
2.5 - 3.5	3	6	0.317

Patient's indications for Warfarin:

	Pharmacist-led	Cardiologist-led	p-value
5. Indications:			
AF	14	7	0.127
Heart Valves Replacement	9	10	0.819
CRHD	8	8	1.000
DVT	0	3	-
PE	3	5	0.48
Others	2	1	-

Anticoagulation Control

1. % patient-time spent within expanded therapeutic INR range (therapeutic \pm 0.2 units INR) [using Rosendaal's Linear Interpolation method]

Pharmacist-led (Study group)	Cardiologist-led (Control group)	P-value
84.68%	60.32%	P<0.001



Better anticoagulation control with pharmacist-led group



Anticoagulation Control

2. Time to achieve therapeutic INR after dosage adjustment

Pharmacist-led (Study group)	Cardiologist-led (Control group)	P-value
23.43 days	109.84 days	$p < 0.005$



Pharmacist-led group achieve therapeutic INR quicker



Anticoagulation Control

3. Days between follow-ups:

Pharmacist-led (Study group)	Cardiologist-led (Control group)	P-value
62.53 days	75.29 days	p=0.245



Similar follow-up intervals
between two groups



Incidence of complications

	No of incidence	
	Pharmacist-led (Study group)	Cardiologist-led (Control group)
Major thromboembolic events	0	1
Major haemorrhagic events	1	0
A&E visits	1	1
Hospitalisation	1	1



No significant difference
between two groups

Patient's Satisfaction Survey



1. Dosage adjustment:

- 100% strongly agreed they are well-informed on the arrangement of dosage adjustment

2. Warfarin Knowledge:

- 80% strongly agreed the clinic had increased their understanding of their medical condition
- 90% strongly agreed they are well-informed on the diet, TCM & OTC restrictions and thereby made changes in their diet

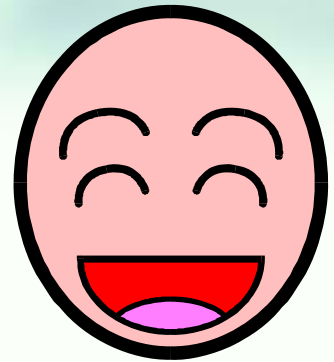
Patient's Satisfaction Survey

3. Waiting time:

- 95% satisfied with the shorter waiting time during follow-up clinic

4. Staff attitude:

- 95% rated pharmacists have very good attitude



5. Overall satisfaction:

- Score: 4.8 (5-point likert scale, 1 – lowest; 5 - highest)

Benefits of the Pharmacist-led Warfarin Clinic:

1. Patient's INR:

- Better control (more time within target range)
- Achieve therapeutic INR quicker after dosage adjustment
- Improved knowledge on Warfarin management

2. Physician:

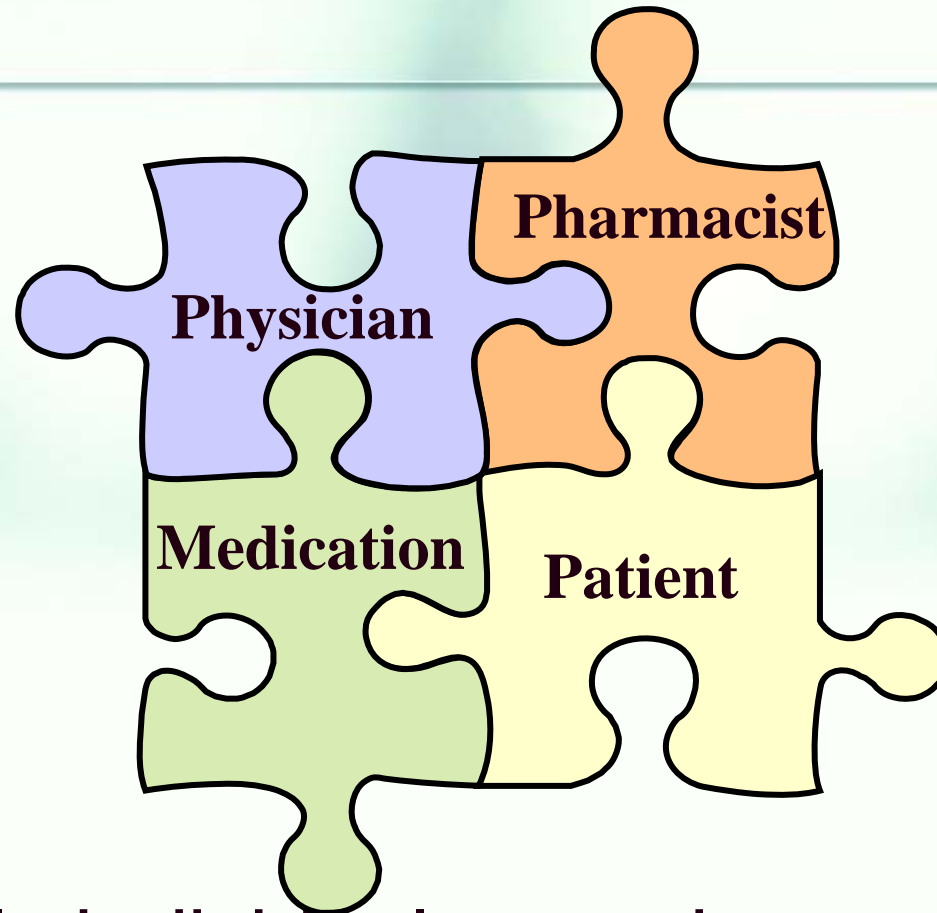
- Spend more time with hard-to-manage cases

3. Healthcare resources:

- Better utilization of pharmacist expertise in the management of Warfarin therapy



Work hand-in-hand



Apply individual expertise to achieve
beneficial outcome!

Thank you!

