Medication Adherence

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“Adherence is the extent to which a person’s behavior — taking medications, following a diet, and/or executing lifestyle changes corresponds with agreed recommendations from a health care provider.” – World Health Organization

Nonadherence by the numbers

- 50% of patients with chronic disease do not take their medications as prescribed.
- Cost of non-adherence in the U.S. exceeds $100 billion annually.
- 1/3 to 2/3 of all medication related hospitalizations in the U.S. are the result of poor medication adherence.
- Non-adherence accounts for 30-50% of treatment failures.

References:

Facts About Medicine Taking

- 1/3 of patients always take prescribed medicines as recommended
- 1/3 take it sometimes
- 1/3 never take their prescribed medicines

Two thirds do not take their medications as prescribed!
# Average Adherence in Studies of 17 Disease conditions

<table>
<thead>
<tr>
<th>Disease conditions</th>
<th>No. of Studies</th>
<th>Mean Adherence (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV disease</td>
<td>8</td>
<td>88.3</td>
</tr>
<tr>
<td>Arthritis</td>
<td>22</td>
<td>81.2</td>
</tr>
<tr>
<td>Gastrointestinal disorders</td>
<td>42</td>
<td>80.4</td>
</tr>
<tr>
<td>Cancer</td>
<td>65</td>
<td>79.1</td>
</tr>
<tr>
<td>Seizures/brain disorders</td>
<td>9</td>
<td>78.4</td>
</tr>
<tr>
<td>Genitourinary and STDs</td>
<td>17</td>
<td>77.0</td>
</tr>
<tr>
<td>Skin disorders</td>
<td>11</td>
<td>76.9</td>
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<tr>
<td>Cardio vascular diseases</td>
<td>129</td>
<td>76.6</td>
</tr>
<tr>
<td>ENT and mouth disorders</td>
<td>30</td>
<td>76.1</td>
</tr>
<tr>
<td>Blood disorders (not leukemia)</td>
<td>7</td>
<td>75.6</td>
</tr>
<tr>
<td>OB-GYN</td>
<td>19</td>
<td>74.8</td>
</tr>
<tr>
<td>Infectious disease</td>
<td>34</td>
<td>74.0</td>
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<tr>
<td>Eye disorders</td>
<td>15</td>
<td>72.6</td>
</tr>
<tr>
<td>End-stage renal disease</td>
<td>20</td>
<td>70.0</td>
</tr>
<tr>
<td>Pulmonary diseases</td>
<td>41</td>
<td>68.8</td>
</tr>
<tr>
<td>Diabetes</td>
<td>23</td>
<td>67.5</td>
</tr>
<tr>
<td>Sleep disorders</td>
<td>16</td>
<td>65.5</td>
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</tbody>
</table>

*Symptomatic conditions: HIV disease, Arthritis, Gastrointestinal disorders, Cancer, Seizures/brain disorders, Genitourinary and STDs, Skin disorders, Cardio vascular diseases, ENT and mouth disorders, Blood disorders (not leukemia), OB-GYN, Infectious disease, Eye disorders, End-stage renal disease, Pulmonary diseases, Diabetes, Sleep disorders.*

*Chronic conditions: HIV disease, Arthritis, Seizures/brain disorders, Skin disorders, Cardio vascular diseases, ENT and mouth disorders, Blood disorders (not leukemia), OB-GYN, Infectious disease, Eye disorders, End-stage renal disease, Pulmonary diseases, Diabetes, Sleep disorders.*
The Five Dimensions of Adherence

1. Social & Economic
2. Health Care System
3. Condition-Related
4. Therapy-Related
5. Patient-Related

- Socioeconomic status
- Level of education
- Race: Culture and lay beliefs
- Distance from treatment centre

- Patient-provider relationship
- Failures of communication
- Poorly developed health services
- Inadequately trained
- Overworked

- Regimen Complexity
- Duration of treatment
- Frequent changes
- Impact on lifestyle
  - Diuretics
  - Interactions with alcohol
  - Driving
- Past experiences with treatment

- Severity of symptoms
- Nature of the disease (acute/chronic)
- Level of disability
- Rate of progression
- Prognosis
- Comorbidities

- Age
- Language
- Beliefs
- Knowledge
- Motivation

- Severity of symptoms
- Nature of the disease (acute/chronic)
- Level of disability
- Rate of progression
- Prognosis
- Comorbidities
The role of pharmacists

- Patient-centered approach
- Shared decision-making
- Systematic follow-up
- Achievable outcomes
- Social support
- Verbal and nonverbal
- Aids/tools

“Drugs don’t work in patients who don’t take them” - former U.S. Surgeon General, C. Everett Koop
Methods to increase adherence

- Linking with daily activity
- Compliance-aids
- Specialized labels
- Involve caregivers
- Behavioural counseling
- Patient education
- Goals/systematic plan
- Rewards

- Simple regimens
- Formulations
- Prompts/reminders
- Medilist
- Family members
- Alarm beepers
- Mixing with foods
- Administration aids

[Link to website: http://www.avella.com/specialties/oncology/glowcap-glowpack]
# MY MEDICATION RECORD

**Name:**

**Birth date:**

Include all of your medications on this record: prescription medications, nonprescription medications, herbal products, and other dietary supplements. Always carry your medication record with you and show it to all your doctors, pharmacists, and other healthcare providers.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Take for...</th>
<th>When do I take it?</th>
<th>Start Date</th>
<th>Stop Date</th>
<th>Doctor</th>
<th>Special Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glyburide</td>
<td>5mg</td>
<td>Diabetes</td>
<td>Morning</td>
<td>Noon</td>
<td>1/15/08</td>
<td>Johnson (000-0000)</td>
</tr>
</tbody>
</table>

This sample Personal Medical Record (PMR) is provided only for general informational purposes and does not constitute professional health care advice or treatment. The patient (or other user) should not, under any circumstances, solely rely on, or act on the basis of, the PMR or the information therein. If he or she does so, then he or she does so at his or her own risk. While intended to serve as a communication aid between patient (or other user) and health care provider, the PMR is not a substitute for obtaining professional health care advice or treatment. This PMR may not be appropriate for all patients (or other users). The National Association of Chain Drug Stores Foundation and the American Pharmacists Association assume no responsibility for the accuracy, currentness, or completeness of any information provided or recorded herein.
Sample pictogram labels (from left) Pictogram 1: This medicine can cause drowsiness and enhance the effect of alcohol. Do not drive or operate machinery. Pictogram 2: Take with or after food. Pictogram 3: Take one twice a day in the morning and in the evening. Pictogram 4: Take one twice a day.
CURRENT SCENARIO IN INDONESIA
Medication adherence and economic problem among patients with type 1 diabetes in Central Java Province, Indonesia

Agustini Utari*, Asri Purwanti, Rudy Susanto

The parent’s biggest concern (70% of parents) is related with the high cost of lifelong medication and laboratory evaluation. Some children have no insurance and even though some of them have insurance but not cover all the cost. Some barriers of medication adherence were related with economic problem and insulin injection which were scary for some young children. Complementary therapy including herbal treatment were usually used alongside of conventional treatment.
Factors that influence treatment adherence of tuberculosis patients living in Java, Indonesia

Bagoes Widjanarko¹,²
Michelle Gompelman³
Maartje Dijkers⁴
Marieke J van der Werf⁵,⁶

Results: The most frequently mentioned reason for nonadherence to treatment was feeling better. Although the drugs were given free of charge, many patients were nonadherent because of lack of money. **Social support was considered very important for adherence**. The study indicated that some patients had a negative image about the health care staff, treatment, and quality of medication.
Factors that Influence Adherence to Antiretroviral Treatment in an Urban Population, Jakarta, Indonesia

Emma Rosamond Nony Weaver¹³, Masdalina Pane¹×¹, Toni Wandra¹, Cicilia Windiyaningsih¹, Herlina¹, Gina Samaan²

Results: Two hundred and sixty-one patients participated, of whom 77% reported ART adherence in the last 3 months. The level of social support experienced was independently associated with adherence where some social support \((p = 0.018)\) and good social support \((p = 0.039)\) improved adherence compared to poor social support. Frequently cited reasons for not taking ART medication included forgetting to take medication (67%), busy with something else (63%) and asleep at medication time (60%).
IMPACTS OF COUNSELING ON ADHERENCE TO PRESCRIBED MEDICATIONS AND BLOOD PRESSURE OF HYPERTENSIVE PATIENTS IN FOUR INDONESIAN PRIMARY HEALTH CENTERS

NASUTION A¹, KHAIRUNNISA¹, TANJUNG HR¹

¹Fakultas Farmasi, Universitas Sumatera Utara, Jalan Tri Dharma No.5, Kampus USU, Medan 20155, Indonesia.

Objective: To analyze the impacts of pharmacist counseling on adherence to medications and reduction in systolic and diastolic blood pressures (SBP/DBP) of hypertensive outpatients.

Methods: A retro-prospective cohort study was undertaken to evaluate the impacts of two-month period counseling on medication adherence and SBP/DBP of hypertensive patients (n=47) insured by Social Security Organizing Body in primary health centers (Medan Deli, Helvetia, Darussalam, and Teladan) in Medan. Inclusion criteria were patients diagnosed with hypertension, age ≥ 18 years, and under treatment of antihypertensive drugs. A questionnaire was used to assess characteristics of the patients, antihypertensive drugs provided, and BP. The eight-item Morisky Medication Adherence Scale (MMAS-8) of each patient was assessed. Characteristics of the patients and antihypertensive drugs provided were descriptively analyzed. Impacts of counseling on medication adherence and SBP/DBP of the patients were analyzed using Wilcoxon test. All analyses were performed using Statistical Package for the Social Sciences (SPSS, version 19, Chicago, IL, USA) (p value <0.05 was considered significant).

Results: Characteristics of the patients: male, 23.4%, female, 76.6%, mean age, 61.22 ± 9.90 (years). MMAS-8 score improved significantly from 4.58 before counseling to 6.28 after counseling, p = 0.000. There was a reduction in SBP from 160.49±23.15 mmHg before counseling to 149.04 ± 21.02 mmHg after counseling, p = 0.001. DBP also reduced from 91.23 ± 12.82 mmHg before counseling to 87.14 ± 9.94 mmHg after counseling, p = 0.014.

Conclusion: Counseling improves adherence to prescribed medications and BP in hypertensive patients.
Improving diabetic patients' adherence to treatment program by using community based interactive approach (CBIA-DM) strategy in hospital-based patients community

Titien Siwi Hartayu1,2, Aji Rustamaji2, Nurita Prasidayani2, Sri Suryawati2

Intervention: Small group discussion interactive approach in one session program with two hours duration of activities. The activities covered introduction, active self-learning using CBIA-DM package, and wrap up and conclusion by DM experts. Data were collected at pre-intervention, immediately, 2 weeks and 4 weeks post intervention. Adherence to treatment program was assessed by calculating the number of remaining tablets on the day pre test and post test, recording patients' recall in diet, exercise and foot care practices per day and per week by nurses. Effectiveness of this hospital-based patient community program in charity hospital setting was assessed based on the increasing of knowledge, attitude, practice, adherence, intervention cost and acceptance of CBIA-DM by providers and participants; using Wilcoxon test, p < 0.005.

Results: CBIA-DM group significantly improved the knowledge score from 7.7 to 8.6 (p < 0.005) and practice from 4.6 to 6.0 (p < 0.005) with score range 0-11, but not for the attitude score. Adherence increased from 30% vs. 16.7% at baseline, up to 46.7% vs. 23.3% at post 1 and 30% vs. 13.3% at post 2. CBIA-DM program was conducted in two hours with unit cost US$ 4.00 per person cheaper than regular seminar in DM Club (US$ 8.00). Participants and provider expressed that CBIA-DM was easy to be followed and enjoyable.
Developing of an educational material (CBIA-DM package)

Training of facilitators

FGD among randomly selected members of diabetic club to obtain their needs for information.

Results of FGD used for drafting educational material.

- Draft was reviewed by experts
- Pilot test of the draft among selected members of DM club

The educational material: CBIA-DM package (7 booklets)

1. Activities Guideline
2. Issues of DM
3. About DM
4. Healthy Lifestyle
5. Physical Activities
6. Foot Care
7. Diet Program
Self-Management Family Participation Program for Medication Adherence among Indonesian People with Schizophrenia: A Randomised Controlled Trial Study

Sri Padma Sari, Wandee Suttharangsee, Weena Chanchong, Sue Turale

Fifty participants diagnosed with schizophrenia and living in the community, and their caregivers, were assigned to either a control group or an experimental group using block randomization (25 participants and caregivers per group). The experimental group received a one-month program which involved a mental health education and counselling session, an illness and medication management booklet, two telephone follow-ups, and face-to-face follow-up with participants and their caregivers. The control group received usual care during the study and a mental health

Results showed that there were significant differences in adherence behavior and attitudes toward medication between the experimental and the control group. This study offers evidence
Medication Therapy Adherence Clinic (MTAC)
First introduced in 2004 as part of the clinical pharmacy services in the Ambulatory Clinic System. Emphasizes medication management to improve quality, safety, and cost-effectiveness of patient care.

- **Services:**
  - Drug therapy monitoring
  - Patient education
  - Clinical pharmacokinetic consultation
  - Laboratory monitoring
  - Dosage adjustment

- **The primary objectives:**
  - to **optimise** drug therapy,
  - to **improve** medication adherence and
  - to **reduce or prevent** the occurrence of adverse events and complications due to the drug regimen.
MTAC Services in Malaysia

- Psychiatry
- Warfarin
- Respiratory
- Diabetes
- Stroke
- Rheumatology
- Psoriasis
- Haemophilia
- Retroviral diseases
The 1st MTAC in Malaysia, Post-Renal Transplant MTAC, was started in year 2004.
MTAC Services

- Set-up within clinic
- Private
- Patient education is key
- Logistics
- Time per patient
- Staffing
- Member of healthcare team – review, referral
- Dispense in clinic
- Appointment

"My diabetic research shows that test subjects are 98% more likely to take their diabetic pills if the pills are covered in chocolate."
Components

- Interview
- ‘Contract’
- Pharmaceutical care
- Intervention/referral
- Patient education
- Systematic follow-up
- Monitoring
- Documentation
- Clinic staff
Design and set up of MTAC services in the community and hospital setting
MTAC: DIABETES
1- Patient Selection

1. Patients with uncontrolled DM
   - HbA1c > 8%
   - FBS > 6.1mmol/l
   - 2hrs post prandial sugar level > 8.0mmol/l

2. Comorbidities

3. Multiple Rx

4. Complications (macrovascular and microvascular)
2- Initial Assessment

Baseline
- VS & Labs
- Past medical and medication history
- Social and family history
- Medication knowledge
- Adherence
- Rx-related problems and issues

MTAC
- Mission
- Benefits
- Goals
- Drug therapy-related needs
- Rights and responsibilities
- Sign informed agreement
- Tagging
The Medication Therapy Management Core Elements Service Model

The diagram below depicts how the MTM Core Elements interface with the patient care process to create an MTM Service Model.

❖ MEDICATION THERAPY REVIEW

- Interventions directly with patients
- Physician and other healthcare professionals

❖ INTERVENTION AND/OR REFERRAL

- Possible referral of patient to physician, another pharmacist or other healthcare professional

- Create/Communicate
- Complete/Communicate & Conduct

❖ PERSONAL MEDICATION RECORD (PMR)

❖ MEDICATION-RELATED ACTION PLAN (MAP)

❖ DOCUMENTATION & FOLLOW-UP
3- Appointment

- Need of assessment after initial visit
- Current health status
- Other clinic appointments
- Medication refills
- Change in medication
- Patient’s ability to handle one month or more of medication supply
- Visit schedule at DM clinic
- Other reasons – ER visits, worsening of symptoms, increased clinic visits etc
4- Second and Subsequent Visits

- Assessment of glycemic control and discussion of clinical results
- Therapeutic goals
- Adherence (reassurance and reinforcement)
- Interview
- Education
- Documentation – lab, self monitoring results
- Pharmaceutical care – DRPs, interventions
- Nonpharmacological
- Monitoring
EDUCATION OUTLINE FOR DIABETES PATIENTS

First Visit
- Brief overview on diabetes
- Therapeutic goals, specifically blood glucose (HbA1c, FBG etc.)
- Specific discussion on medication use/adverse effects with the patient (insulin and hypoglycemic agents)
- Self monitoring of blood glucose (SMBG) - how, when, why etc. (if applicable)
- Signs and symptoms of hypo/hyperglycaemia, sick day management and course of action to be taken
- Patient concerns

Visit 2
- Other therapeutic goals (Blood pressure, Lipid etc.)
- Benefits, risks and options for improving blood glucose controls
- Foot care
- Specific drug counselling
- Patient’s concerns

Visit 3
- Benefits of exercise
- Hypoglycaemic reactions (reminder)
- Basic nutrition
- Patient’s concerns

Visit 4
- In-depth discussion on diabetes (macro & micro complications, etc.)
- Cardiovascular education (Lipids, blood pressure, peripheral vascular disease, set goals)
- Prevention, detection, and treatment of complications
- Patient’s concerns

Visit 5
- Health benefits of good glucose control
- Smoking cessation (if applicable)
- Alcohol reduction (if applicable)
- How to continue goals, long term plans.

Subsequent follow-ups
- Revision of treatment goals
- Specific drug counselling
- Patient’s concerns
6- Documentation

- Demographic
- PMH/PMxH
- SH/FH
- Allergies
- VS
- Lab
- Assessment of patient’s medication knowledge
- Assessment of patient’s adherence
- PC issues and pharmacist’s plans

“Be sure to take this drug exactly as directed: tilt your head to the right at a 37 degree angle, extend your tongue precisely 4.93182 inches past the furthest point of the upper lip, place the pill directly between the 48th and 49th taste bud on the left side of the tongue...”
Modified Morisky Medication Adherence Scale

<table>
<thead>
<tr>
<th>Visit</th>
<th>Visit 2</th>
<th>Visit 3</th>
<th>Visit 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Date</td>
<td>Date</td>
<td>Date</td>
</tr>
</tbody>
</table>

1. Have you forgotten to take your medication in the past 3 months?
2. Are you sometimes neglectful in regard to your medication times?
3. Do you skip your medicine hours when you are feeling well?
4. When you feel bad due to the medicine, do you skip it?
5. Have you ever forgotten your medication while travelling/going on a trip?
6. Do you have problems in remembering to take your medication?
7. Does the current treatment regime come across to you as troublesome?
8. Frequency of forgetting medication:
   a) 0-1 doses per week (3 marks)
   b) >2 doses per week (1 mark)
   c) >3 doses per week (2 marks)

Score: (0-2 Non-compliant, 3=Average, 4-9 Non-compliant)

Notes on compliance

LABORATORY VALUES

<table>
<thead>
<tr>
<th>Laboratory Parameters</th>
<th>Normal Value</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose (mmol/L)</td>
<td>4.4 - 6.0</td>
<td></td>
</tr>
<tr>
<td>Blood Pressure (mmHg)</td>
<td>&lt;10/60</td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height (cm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body Mass Index (BMI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSH (mU/L)</td>
<td>0.3 - 3.5</td>
<td></td>
</tr>
<tr>
<td>T3 (ng/dL)</td>
<td>120 - 145</td>
<td></td>
</tr>
<tr>
<td>T4 (ng/dL)</td>
<td>5.5 - 11.5</td>
<td></td>
</tr>
<tr>
<td>Creatinine (mg/dL)</td>
<td>0.6 - 1.6</td>
<td></td>
</tr>
<tr>
<td>Cr (mg/dL)</td>
<td>0.7 - 1.3</td>
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</table>

Liver Function

<table>
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<tr>
<th>Laboratory Parameters</th>
<th>Normal Value</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin (g/L)</td>
<td>35 - 50</td>
<td></td>
</tr>
<tr>
<td>Globulin (g/L)</td>
<td>20 - 26</td>
<td></td>
</tr>
<tr>
<td>Bilirubin (mg/dL)</td>
<td>0.2 - 1.5</td>
<td></td>
</tr>
<tr>
<td>ALT (IU/L)</td>
<td>0 - 55</td>
<td></td>
</tr>
<tr>
<td>AST (IU/L)</td>
<td>24 - 104</td>
<td></td>
</tr>
<tr>
<td>LDH (IU/L)</td>
<td>50 - 210</td>
<td></td>
</tr>
</tbody>
</table>

Light Profile

<table>
<thead>
<tr>
<th>Laboratory Parameters</th>
<th>Normal Value</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholesterol (mg/dL)</td>
<td>130 - 180</td>
<td></td>
</tr>
<tr>
<td>Triglycerides (mg/dL)</td>
<td>50 - 150</td>
<td></td>
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</tbody>
</table>

Others

Notes
<table>
<thead>
<tr>
<th>Pharmaceutical Care Issues</th>
<th>Pharmacist Intervention</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
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</table>
MTAC: WARFARIN
I. APPENDICES
Appendix 1: MTAC Warfarin Workflow

1. Registration
   - Follow-up visit for INR

2. New Case
   - 1. Quick referral form (MTAC_Warfarin/F1) completed by doctor
   - 2. Check Indication, Duration of Treatment & INR target

3. Discharge
   - 1. Document patient's clinical progress on Follow-up Visit Form (MTAC_Warfarin/F3)
   - 2. Check INR
   - 3. Check bleeding/thrombosis symptoms

4. Sign & Symptoms of Bleeding/Thrombosis
   - Yes
     - INR more than 1 and less than 4
       - No
         - Yes: Refer to physician
         - No: INR with in target range
       - General Counseling
         - 1. Discharge on anticoagulants
         - 2. Advice to maintain consistent diet
         - 3. No dose adjustment

5. INR more than 1
   - No: No dose adjustment
e
6. INR less than 1
   - Yes: No dose adjustment

7. INR within target range
   - Yes: Continue prescribed treatment
   - No: No dose adjustment

8. Discharge
   - 1. INR range is based on agreement between the Head of Cardiology/Medical and Pharmacy
   - 2. Complete documentation and write down patient's clinical notes
   - 3. Dispense warfarin tablets
   - 4. Send prescription for count sign by physician and clinical nurse for comments or reference
CARTA ALIR PESAKIT (COAGUCHEK)
WARSAWAN MEDICATION THERAPY ADHERENCE CLINIC

Pesakit menuhi nomor geri di kaunter pendaftaran, Compleks Rawatan Hati (ACC).
Tingkat Bawah

Pesakit melakukan uji INR di MOPD bilik 42

Pesakit menyerahkan surat resepkan INR di kaunter untuk mendapatkan nomor pilan

Tunggu pilan untuk bersama dengan doktor / pekerja farmasi menghitung baki untuk masa

Pertama jumpa doktor

TA

TDAK

Pegawai Farmasi
Bilik 45, 50, 52

Ubah warna pil di bilik

Buat temujan baru di bilik 45

Timet

MOPD Bilik Doktor 15, 54, 15*

Pegawai Farmasi
Bilik 45, 50, 52

Untuk pengisian pil

Konseling Pegawai Farmasi & kegiatan uji pil
Bilik 46 & 44

*Surat keputusan HP alkoudikan

Semua kepada pesakit

MONASH University
## Appendix 2: Warfarin Referral Form

### Medication Therapy Adherence Clinic - Warfarin Referral Form

**Pharmacy Department, Hospital:**

<table>
<thead>
<tr>
<th>Date</th>
<th><strong>Patient Details</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name:</td>
</tr>
<tr>
<td></td>
<td>Age:</td>
</tr>
<tr>
<td></td>
<td>Race: M / F / O:</td>
</tr>
<tr>
<td></td>
<td>MRN:</td>
</tr>
<tr>
<td></td>
<td>ID No:</td>
</tr>
<tr>
<td></td>
<td>Gender: M / F:</td>
</tr>
<tr>
<td></td>
<td>Phone No:</td>
</tr>
</tbody>
</table>

### Warfarin Therapy

- **Target INR Range:**
  - 1.5 – 2.5
  - 2.0 – 3.0
  - 2.5 – 3.5
  - Other (please specify):

- **Warfarin Indication:**
  - Arterial Embolism
  - Carotid Arterial Embolism
  - Cardiovascular Accident
  - Deep Vein Thrombosis (describe):
  - Heart Valve Replacement (describe):
  - Pulmonary Embolism
  - Pulmonary Hypertension
  - Transient Ischaemic Attack
  - Other (please specify):

### Clinical Information

- **Is this patient on Anticoagulant Drugs? Yes / No**
  - o Aspirin
  - o Clopidogrel
  - o Other (please specify):

### Concurrent Illness

- o CVA
- o Hyperthyroidism
- o Hyperlipidemia
- o Hypercoagulable
- o Hypertension
- o Heart Failure
- o Kidney Disease
- o Peptic Ulcer Disease
- o Renal Impairment
- o Severe Disorder
- o Other (please specify):

### Bleeding Risk Factors (Mark all that apply):

1. **Age ≥ 65**
2. **History of stroke**
3. **History of gastrointestinal bleeding**
4. **One or more of the following:**
   - **Hct <30%**
   - **Cr ≥ 133 umol/L**

### Classify Your Patient Overall Bleeding Risk (Total of 1 - 4)

- **High Risk (3 – 4 Points)**
- **Intermediate Risk (1 – 2 Points)**
- **Low Risk (0 Point)**

### Concurrent Drug Therapy

<table>
<thead>
<tr>
<th>Name</th>
<th>Dose</th>
<th>Freq</th>
</tr>
</thead>
</table>

### Comments:  

### Physician Review & Notes

Referring Physician’s Signature and Chop
Checklist for Warfarin Education

- Uses lay terms throughout, medical terms are in parenthesis.
- Italicized notes should only be addressed if asked by the patient.

**Introduction**

- Name________________________
- Pharmacist from__________________
- "I'm here to educate you a new drug you will be starting soon called warfarin"
- "Have you been told what this drug is for?"

**Warfarin is...**

- A blood thinner also known as an anticoagulant.
- Decreases formation of blood clots.
- Blood clots can cause a stroke, heart attack, or blood clots in the legs (DVT) or lungs (PE).
- INR: the liver makes clotting factors to help the blood clot and prevents you from bleeding. With some serious conditions, your blood can clot too much. Warfarin blocks the clotting factors made by the liver, preventing your blood from clotting (thins your blood).
- Clotting factors are dependent on vitamin K. Therefore, taking more vitamin K than usual may decrease the effects of warfarin and may put you at risk for clot formation.

**You are asked to take warfarin because...**

- You just experienced_________
  - A leg clot (DVT)
  - A lung clot (PE)
  - An arrhythmia (atrial fibrillation)
  - A heart attack (MI)
  - The placement of a mechanical or bioprosthetic heart valve.
- By taking warfarin, it will treat your__________ (current event) and prevent you from having another clotting event (thromboembolic event).

**Your initial warfarin dose...**

- Will be determined by your doctor.
- Your dose may change based on your regular blood tests.
- No matter what the dose, you must take your warfarin everyday and at the same time every day.
- If you miss a dose, take the dose as soon as you remember if within the same day, DO NOT double your dose the next day to make-up for the missed dose.
- Warfarin can be taken with food or on an empty stomach.

**Your regular blood tests...**

- Will check your response to warfarin (is your blood too thin or not thin enough?, how quickly will you bleed clot or the dose your on?)
- This blood test is called an INR test (International Normalized Ratio).
- The goal is to keep your INR between a certain range that will be determined by your doctor. This will assure us that warfarin is effectively

**Possible side effects of warfarin are...**

- Bleeding problems, all, tongue, liver problems, low BP, swelling, paleness, fever, and rash.
- If any of these side effects or other unusual event occurs after the start of warfarin, alert your healthcare provider.
- **T**hese side effects can be prevented as long as regular blood tests are done and diet is consistent to assure an appropriate dose is given.
- The most concerning side effect is the bleeding, which is the result of the blood is being too thin.

- Alert your healthcare provider if you have signs and symptoms of bleeding:
  - Pain, swelling, or discomfort
  - Headache, dizziness, or weakness
  - Bruising (careful with machinery, sharp object or aggressive sport)
  - Avoid activities that may cause bleeding (acupuncture, massage, capping/breaking)
  - Nosebleeds
  - Bleeding gums (careful when brushing teeth – use soft toothbrush)
  - Pink or brown urine
  - Red or black stools
  - Yawning blood or material that looks like coffee ground.

**Rare side effect include...**

- Death of skin (RARE: skin necrosis or gangrene; can occur soon after starting Coumadin (3-8 days) because blood clots form and block blood flow to area of the body (high adipose tissue). Patients may be protein C deficient)
- Purple toes syndrome (MORE RARE: painful purple lesions on the toes; occurs 3-8 weeks after starting warfarin. Patients may have vascular thrombosis. Warfarin-induced bleeding into the cholestrol plaques and cholestrol crystal emboli are released and travel to the small arteries of the foot and lower legs).

**Many Rx/O TC/herbal/vitamins can interact with warfarin**

- Try to avoid NSAIDs (ibuprofen, naproxen) and aspirin for pain or inflammation as these can increase your risk for bleeding while on warfarin.
- Always alert your healthcare provider before starting or stopping any Rx/O TC/herbal/vitamin agents.
### Medication Therapy Adherence Clinic Visit Form

**First Visit Form**

**Pharmacy Department, Hospital**

#### Date of Visit:

- **Name:**
- **Age:**
- **Race:** M / C / O
- **Gender:** M / F

#### Address:

- **Telephone &**:
- **Home/Office:**
- **Handphone:**

#### Indication:

- **Target INR:**
- **Anticoagulant dose:**
- **Co-morbid Medical Conditions:**

#### Medications

<table>
<thead>
<tr>
<th>Name</th>
<th>Dose</th>
<th>Name</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Objective Information

- **INR (Laboratory):**
- **INR (Point of Care):**

#### Subjective Information

- **Signs of bleeding:** Y / N
- **Signs of thrombosis:** Y / N
- **Correct dose taken:** Y / N
- **Missed doses in past 1 week:** Y / N

#### Change in Physical Activity:

- **Activity:** Y / N

#### Diet / Herbal Supplements changes:

- **Changes:** Y / N

#### Assessment

- **Other complaints / Plans:** Y / N

#### Pharmacological Plan

- **Warfarin dose recommended:**
- **Next INR Review Date:**

#### Physician's Signature and Stamp

**Date:**

**Signature:**

**Address:**

**Telephone:**

**Fax:**

**Email:**

**Mail:**

**Website:**

**Comments:**
# Appendix 5: Follow Up Visit Form

**Medication Therapy Adherence Clinic Workarun - Follow Up Visit Form**

**Pharmacy Department, Hospital**

---

### Patient Information

- **Name:**
- **MRN/ID:**
- **Age:**
- **Diagnosis/Indication:**
- **Missed appointments:** Y/N (Explain if Yes)
- **Same indication:** Y/N (Describe if No)
- **Same target INR:** Y/N (Describe if No)

### Objective Information

- **INR (Laboratory):**
- **INR Point of Care:**

<table>
<thead>
<tr>
<th>Current Warfarin Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon</td>
</tr>
<tr>
<td>-----</td>
</tr>
</tbody>
</table>

### Subjective Information

- **Signs of bleeding:** Y/N (Describe if Yes)
- **Signs of thrombosis:** Y/N (Describe if Yes)
- **Current dose taken:** Y/N
<table>
<thead>
<tr>
<th>Non</th>
<th>Tues</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
<th>Sat</th>
<th>Sun</th>
</tr>
</thead>
</table>
- **Medications Changes:** Y/N (Describe if Yes)
- **Changes in Medical Status:** Y/N (Describe if Yes)
- **Change in Physical Activity:** Y/N (Specify if Yes)

### Other Complaint/Patients Plans

- **Y/N**

  [Describe if Yes]

### Assessment

- **INR therapeutic:** Y/N

  [Describe]

### Pharmacist Review/Plan

- **Warfarin dose recommended:**

<table>
<thead>
<tr>
<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
<th>Sat</th>
<th>Sun</th>
</tr>
</thead>
</table>

  [Specify]

- **Next INR Review Date:**

  [Specify]

### Physician Review & Notes

- **Pharmacist’s Signature and Stamp:**

  [Stamp]

- **Physician’s Signature and Stamp:**

  [Stamp]
Contoh produk/makanan tambahan/herba yang perlu diejekan
Example of products/food supplement/herbs to avoid

<table>
<thead>
<tr>
<th>Produk yang mengandung bahan-bahan berikut: Products that contains the following ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilberry</td>
</tr>
<tr>
<td>Evening Primrose Oil</td>
</tr>
<tr>
<td>Glucosamine</td>
</tr>
<tr>
<td>Cilatang, anggur merah</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Herba yang boleh meningkatkan hasil INR: Herbs that may increase INR value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angelica Root</td>
</tr>
<tr>
<td>Asafoetida</td>
</tr>
<tr>
<td>Bunga anggun</td>
</tr>
<tr>
<td>Buah berangan</td>
</tr>
</tbody>
</table>

SAMPLES OF WARFARIN TABLETS

<table>
<thead>
<tr>
<th>BRAND: APO WARFARIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mg</td>
</tr>
<tr>
<td>2 mg</td>
</tr>
<tr>
<td>5 mg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BRAND: ORFARIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 mg</td>
</tr>
<tr>
<td>5 mg</td>
</tr>
</tbody>
</table>
COMMUNITY PHARMACY
Community Pharmacy Long Term Conditions (LTC) Service.

- The Service includes developing a Medicines Management Plan (MMP) outlining how the patient can be supported to better self-manage their medicines, such as reconciling medicines, synchronizing prescriptions, and providing other aids such as compliance packs or reminders.

- Develop MMP and use this to record which service aspects have been provided

- Proactively provide monthly support and care for the patient

- Reassess the patient at least once a year

- Work with other pharmacists and health professional in the best interests of the patient
Patient selection

- Patient has experienced a transition of care, and his or her regimen has changed•
- Patient is receiving care from more than one prescriber•
- Patient is taking five or more chronic medications (including prescription and nonprescription medications, herbal products, and other dietary supplements)•
- Patient has at least one chronic disease or chronic health condition (e.g., heart failure, DM, HPT, hyperlipidemia, asthma, osteoporosis, depression, osteoarthritis, COPD)•
- Patient has laboratory values outside the normal range that could be caused by or may be improved with medication therapy•
- Patient has demonstrated nonadherence (including underuse and overuse) to a medication regimen•
Patient selection

- Patient has **limited health literacy or cultural differences**, requiring special communication strategies to optimize care.
- Patient wants or needs to reduce out-of-pocket medication costs.
- Patient has recently **experienced an adverse event** (medication or non-medication-related) while receiving care.
- Patient is taking **high-risk medication(s)**, including narrow therapeutic index drugs.
- Patient **self-identifies** and presents with perceived need for MTAC services.
Medicines Management Plan

- Identification of factors contributing to non-adherence or medicines use problems (including understanding of the medicines or the health condition) and recording of facts to support these identified medicine use issues
- Planning on how to improve self-management of medicines
- Implementation of the agreed changes with the patient
- Review how the changes are being embedded and whether the patient’s self-management of medicines is improving.
Reconciliation

- A process to check that what the patient is taking is what it was intended they should be taking. It is an important first step.

- Reconciliation is about obtaining an accurate, current and complete list of a patient’s medicines, allergies and any previous ADR from a reliable source (or sources) and comparing this with the list of current prescribed medicines and documented allergies and ADRs.

- The aim is to have one ‘source of truth’ for the patient’s medicine regime.
Reminders

- Reminders are a simple way to ensure the patients know when their medicines are about to run out and have time to arrange for a visit to the doctor for a new prescription or a trip to the pharmacy to pick up a repeat prescription

- You can remind patients:
  - When a new prescription is due
  - To pick up a repeat prescription
  - To bring in unused medicines

"...which in turn will cause side effects of nausea, for which I’m giving you Trylitol, which will induce temporary blindness, which I'll counteract with..."
Reminders

- Phone call
- Text
- Email
- Stickers to go in diaries
- Magnets that can be written on for the fridge.
- Electronic diary appointments for those patients that prefer e-mail communication (e.g. Outlook)
- Postcard reminders (Hong Kong HT study)
- Alarm beepers
- Engaging family members
- Medilist

Table 1 Types of dose administration aids

<table>
<thead>
<tr>
<th>Compartmentalised plastic boxes (e.g. Dosette)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reusable devices that are usually filled by the user, sometimes filled by health professionals. Many varieties, with one, two or four compartments for each day of the week. Some devices have the days and times labelled in Braille for people with vision impairment. Some contain a built-in alarm that can be set to remind the user when it is time to take their medicines. Usually not tamper-evident.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blister or bubble packs (e.g. MedicoPak, Webster-Pak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastic or disposable cardboard device with four compartments for each day of the week. Provided by pharmacies. Usually filled manually, although some pharmacies use an automated packing method. Some brands may be easier to use than others. Blister packs for people with low vision or who cannot read English are available from some suppliers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sachet systems (e.g. APHS medication sachets, MPS Packettes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablets and capsules for a particular date and dose time packed in an individual sachet, labelled with the date and time, the medicine details and the patient’s name. Sachets are rolled up in chronological date and time order and usually provided in a container. Sachets are prepared using automated packing technology. Community pharmacies usually outsource sachet packing to a large-scale packing facility, although some pharmacies have installed technology to enable onsite packing.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Automated medication dispensing devices (e.g. Medico, TabTimer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devices that dispense the medicines for a particular dose-time after the user has responded to a built-in reminder alarm that activates when medicines are due to be taken. The device may need to be manually filled or it may dispense pre-filled medication sachets. Some devices have a monitoring function which can send a text message or email to a designated person if the user does not respond to the reminder within a set time.</td>
</tr>
</tbody>
</table>

Picture courtesy of the author

Picture by Australian Prescriber

Picture by Australian Prescriber

Picture with permission from Tabtimer
Thank you

Questions?