

IMPROVING COMPLETENESS OF THERAPEUTIC DRUG MONITORING (TDM) REQUEST FORMS IN HOSPITAL JASIN

Nurul Atika W¹, Fadzilah S¹, Noor Hidayah M¹, Khairul Anuar AK², Noriza S²

¹ Pharmacy Unit, Hospital Jasin

² Pathology Unit, Hospital Jasin



1. INTRODUCTION

Hospital Jasin is a district hospital in Melaka, Therapeutic Drug Monitoring (TDM) service is provided to ensure drug concentration level is within the therapeutic range and thus, optimizing patient outcomes. This service is outsourced to Hospital Melaka resulting in some differences seen in the TDM request workflow.

TDM begins with a preanalytical process where the prescriber identifies the suitable patient. Subsequently, the prescriber will fill in the TDM request form and is dispatched to the Pathology Unit together with blood samples. This follows an analytical process including centrifuging and packaging the blood before sending it to Hospital Melaka. Once the result is validated, pathology staff will inform the pharmacist to interpret and give recommendation to requestor.

The problem arises when the mandatory data needed to calculate the drug concentration is not filled in the request form. The pharmacist could not interpret, and TDM has to be repeated. Consequently, it will delay the treatment, prolong patient's hospitalization and increase mortality. In addition, it may increase hospital's budget, as costs of reagents are expensive and unnecessary expenditure on manpower.

2. SELECTION OF OPPORTUNITIES FOR IMPROVEMENT

PROBLEM	S	M	A	R	T	TOTAL
Increasing number of expired drugs at pharmacy store	4	3	3	4	3	17
HIGH PERCENTAGE OF INCOMPLETE THERAPEUTIC DRUG MONITORING (TDM) REQUEST FORM IN HOSPITAL JASIN	5	4	4	5	3	21
Lack of awareness among staff in Hosp Jasin regarding criteria of sample rejection	4	3	2	3	2	14
Inappropriate storage of reagents	3	2	2	2	3	12
Waiting time in Outpatient pharmacy exceeded 30 minutes	5	3	3	2	1	14

A complete TDM request form need to have information such as sampling time, the time of the last dose, dosage regimen and indication for drug monitoring.

A retrospective analysis conducted in 2019 we found that only 0.5% (n=1) of TDM request forms were filled completely.

This will leads to misinterpretation that causes severe impacts on patient care such as trauma, toxicity, therapeutic failure and prolonged hospitalisation. Furthermore, it will increase workload and waste of resources.

General Objective
To improve the percentage of TDM request forms that are filled out completely with the mandatory information

Specific Objectives
1. To verify the incidence of incomplete TDM request form
2. To determine and investigate the factors contributed to the problem
3. To formulate and implement the strategies to overcome the problem

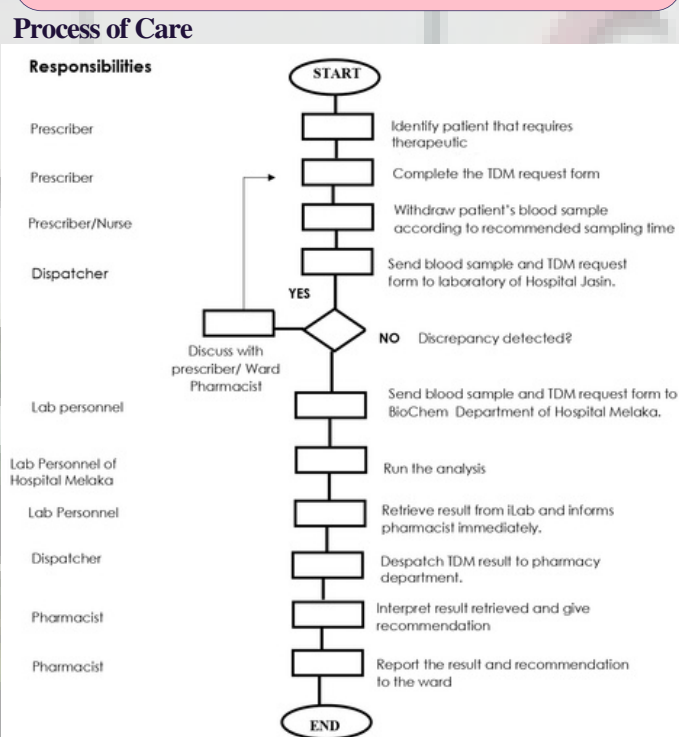
3. KEY MEASURES FOR IMPROVEMENT

Indicator:

$$\frac{\text{Numbers of complete TDM request forms}}{\text{Total numbers of TDM requests form received}} \times 100$$

Based on a group consensus, our team agreed to propose a standard of 75% of complete TDM form throughout this study, an up of 64.6% from minimum range of complete form and less 13.7% from the maximum range of completed form, as reported in previous studies (1,2,3,4).

4. PROCESS OF GATHERING INFORMATION



All TDM forms received by the Pathology Unit are included in this study except for the TDM request forms received from other hospitals when the patient was referred to Hospital Jasin.

TDM request forms were screened, and the completeness was summarised in a data collection form formulated in MS Excel 2019.

Renziadil acton (Menne Proses Kerja) 1.4.20 - 31.12.20

DRUG ANALYSE	WEIGHT	BLOOD SAMPLING (PRE/POST DOSE)	PATIENTS CONDITION	DOSSAGE REGIMEN	LAST DOSE GIVEN	CONCURRENT MEDS
TDM 83/20 VPA	0	1	0	1	1	1
TDM 82/20 PCM	0	1	0	1	1	1
TDM 84/20 DIG	0	1	0	1	1	1
TDM 85/20 VPA	1	1	0	1	1	1
TDM 86/20 CBZ	1	0	0	1	1	1
TDM 87/20 CBZ	1	1	0	1	1	1
TDM 88/20 VPA	1	1	0	1	1	1
TDM 89/20 VPA	1	0	0	1	1	1
TDM 90/20 VCO	0	0	1	1	1	1
TDM 91/20 VCO	0	0	1	1	1	1
TDM 92/20 VCO	0	0	1	1	1	1
TDM 93/20 VCO	0	0	1	1	1	1
TDM 94/20 VCO	0	0	1	1	1	1
TDM 95/20 VCO	0	0	1	1	1	1
TDM 96/20 VPA	1	0	0	1	1	1
TDM 97/20 VCO	0	0	1	1	1	1
TDM 98/20 VCO	0	0	1	1	1	1
TDM 99/20 VCO	0	0	1	1	1	1
TDM 100/20 VCO	0	0	1	1	1	1
TDM 101/20 VCO	0	0	1	1	1	1
TDM 102/20 VCO	0	0	1	1	1	1
TDM 103/20 VCO	0	0	1	1	1	1
TDM 104/20 DIG	1	0	1	1	1	1
TDM 105/20 MTX	1	1	0	1	1	1
TDM 106/20 VCO	1	0	1	1	1	1
TDM 107/20 MTX	1	1	0	1	1	1
TDM 108/20 VPA	1	1	0	1	1	1
TDM 109/20 VPA	1	0	0	1	1	1
TDM 110/20 VPA	0	0	1	1	1	1
TDM 111/20 VCO	0	0	1	1	1	1
TDM 112/20 VCO	1	0	1	1	1	1
TDM 113/20 PHT	1	1	0	1	1	1

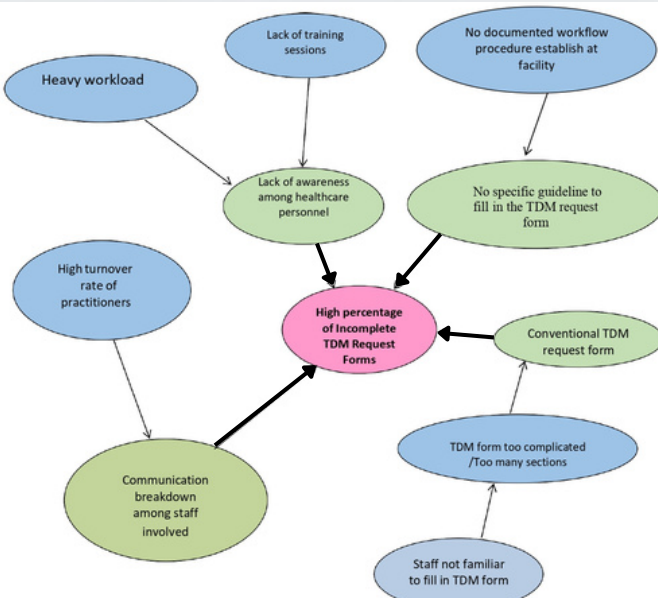
MS Excel 2019 used in data collection

5. ANALYSIS AND INTERPRETATION

PRE-REMEDIAL STUDY (JAN-DEC 2019)

TDM request forms received = 178 forms
TDM request forms completely filled = 1 form
% of complete TDM request forms = 0.5%

For the purpose of this project, findings from previous studies were adapted to the real working situation in Hospital Jasin. Factors contributing to incomplete TDM request forms were:

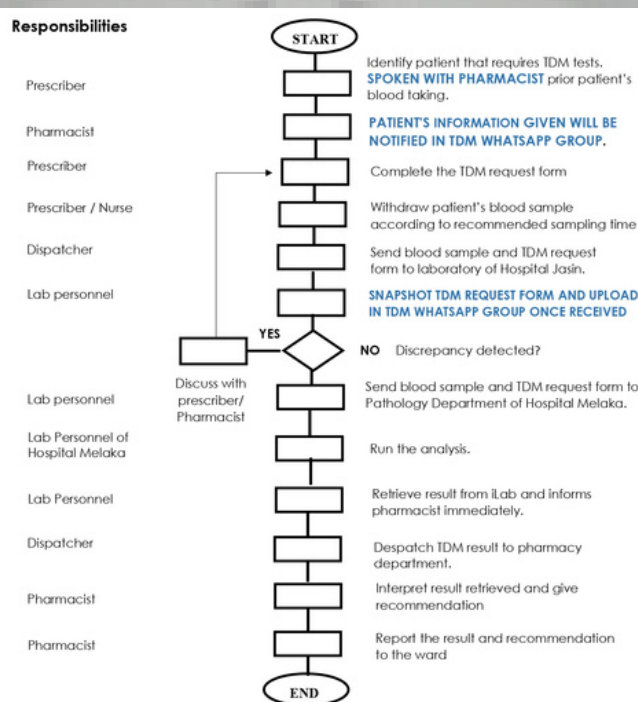


Problem analysis chart from pre-remedial study

6. STRATEGIES FOR CHANGE (FIRST CYCLE)

DATE OF INTERVENTION: APRIL - DECEMBER 2020

Strategy 1: Update and standardise the flowchart for requesting TDM service

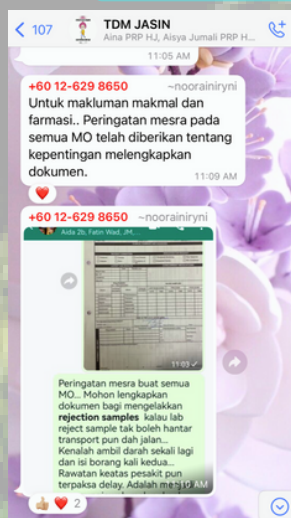


The new flowchart added new step, in which the prescriber (as a requestor) had to inform a pharmacist about the TDM that would be carried out.

The pharmacist would acknowledge the case and provide further if needed. The requestor had to put the pharmacist's name at the top of the form as a confirmation that this step had been followed.

In the flowchart, each step was labelled with the staff member's name and designation, so that everyone was aware of their role in the TDM process.

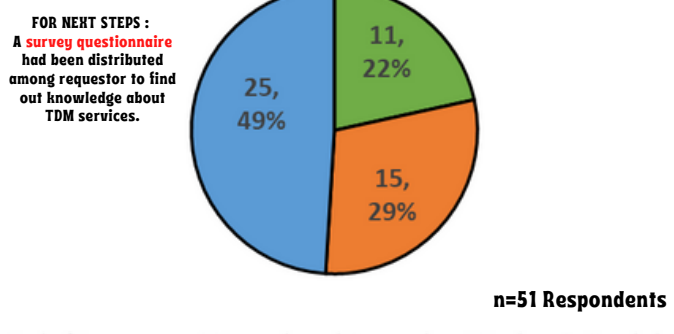
Strategy 2: Creating TDM Whatsapp Group



Doctors, lab personnel, pharmacists, nurses were added in the TDM WhatsApp group to overcome communication breakdown.

7. EFFECTS OF CHANGE (FIRST CYCLE)

TDM request forms received = 298 forms
TDM request forms filled completely = 55 forms
% of complete TDM request forms = 18.4%



Contributing factors that lead to incomplete TDM request forms

8. STRATEGIES FOR CHANGE (SECOND CYCLE)

DATE OF INTERVENTION: MAY 2021 TO DECEMBER 2021

Strategy 1: Discussion with multidisciplinary staff



Discussion of the new flowchart with Orthopedic Ward Hospital Melaka & Medical Ward 2A

Orthopedic Ward Hospital Melaka was temporarily transferred to Hospital Jasin in May 2021 during the high wave of pandemic COVID-19.

Medical Ward 2A was expanding the bed to more medical patients to encounter Medical Ward 2B which was established as COVID-19 Hybrid Ward.

In the discussion, an explanation of the new flowchart was provided.

Strategy 2: TDM Training & TDM Champion



TDM Training involving prescribers, pharmacists, lab personnel and nurses

TDM training was conducted in September 2021 to ensure that staff members involved in the TDM request process would understand the importance of filling out a complete form.

The training was also intended to increase their knowledge of TDM.

All of the participants were then appointed TDM Champion for their ward or unit and added to the TDM WhatsApp group that had been created earlier.

SENARAI EDARAN

Tuan / Puan,
LANTIKAN SEBAGAI THERAPEUTIC DRUG MONITORING (TDM) CHAMPION HOSPITAL JASIN, MELAKA TAHUN 2022 DAN LAPORAN PENGISIAN BORANG PERMOHONAN TDM BAGI JANJIARI & FEBRUARI 2022

Saya dengan segala hormatnya merujuk kepada perkara di atas.

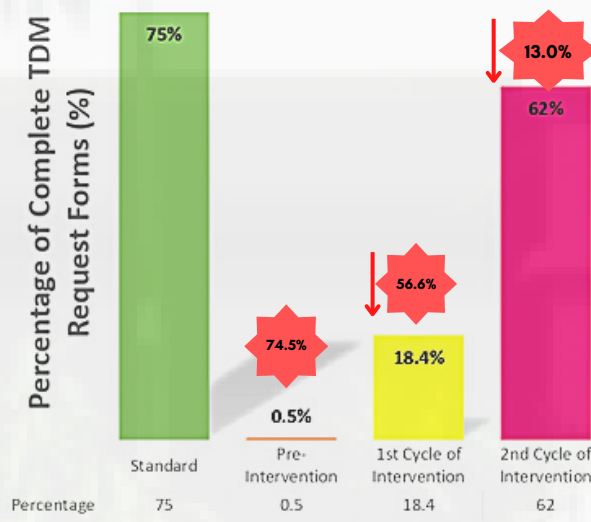
- Sukacita dimaklumkan bahawa Tuan/Puan telah dilantik sebagai TDM Champion Hospital Jasin seperti yang telah dimaklumkan semasa kursus TDM yang telah dianjurkan pada 2 September 2021.
- Peranan TDM Champion adalah untuk:
 - Memaklumkan sebarang maklumat terkini mengenai TDM kepada rakan sekerja
 - Mengambil tindakan susulan untuk sampel darah yang belum diambil
 - Menjadi sumber rujukan untuk prosedur TDM di unit masing-masing
 - Memberi orientasi berkenaan proses pengisian borang TDM dengan betul dan tepat kepada anggota baru di unit
- Tahniah atas lantikan ini dan semoga dengan pelantikan Tuan/Puan sebagai TDM Champion akan menambahkan komunikasi antara unit-unit dan memastikan ususan TDM berjalan dengan lancar seterusnya dapat memberikan rawatan yang optimum kepada pesakit.

Appointment letter as TDM Champion to assist in forms completion

9. EFFECTS OF CHANGE (SECOND CYCLE)

TDM request forms received = 76 forms
TDM request forms filled completely = 47 forms
% of complete TDM request forms = 61.8%

10. ACHIEVABLE BENEFIT NOT ACHIEVED (ABNA)



11. THE NEXT STEP

This study investigated multiple causes of incomplete TDM request forms and produced a highly satisfactory outcome.

The main focus of the intervention:

- Improving communication among multidisciplinary staff members.
- Updating the written SOP
- Educational intervention to raise awareness and knowledge

Doctors must be educated on a regular basis to establish familiarity with the TDM workflow.

Following that, the current research team intends to periodically review the standard based on performance. Accordingly, a monthly report on the monitoring of incomplete forms is to be done as feedback to the requesting ward or unit.

12. REFERENCES

- Nutt L, Zemin AE, Erasmus RT. Incomplete laboratory request forms: the extent and impact on critical results at a tertiary hospital in South Africa. *Annals of Clinical Biochemistry*. 2008; 45(5): 463-466.
- Adogeko OA, Idowu AA, Jeje OA. Incomplete laboratory request forms as a contributory factor to preanalytical errors in a Nigerian Teaching Hospital. *African Journal of Biochemistry Research*. 2011; 5(3): 82-85.
- Oladeinde BH et al. Evaluation of laboratory request forms for incomplete data at a rural tertiary hospital in Nigeria. *New Zealand Journal of Med. Lab. Sci.* 2012; 66(2): 39-41.
- Emanghae E et al. Incompleteness of medical microbiological and parasitology laboratory request forms: an audit of quality service in the Univ. of Calabar Teaching Hospital. *Cross River Journal of Med.* 2018; 2(1): 28-35.