Optimising Pharmacotherapy In Medical Ward Patients: Enhancing Ward Pharmacists' Review Efficiency At Hospital Kuala Lumpur

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KEMENTERIAN KESIHATAN MALAYSIA
HOSPITAL KUALA LUMPUR

1.0 SELECTION OF OPPORTUNITIES FOR IMPROVEMENT

Globally, Drug Related Issues (DRIs) in hospital is 48.3% with half being potentially preventable. Ward Pharmacist plays a vital role in detecting DRIs through Pharmacotherapy Reviews (PRs)

1.1 PRIORITISATION OF PROBLEMS

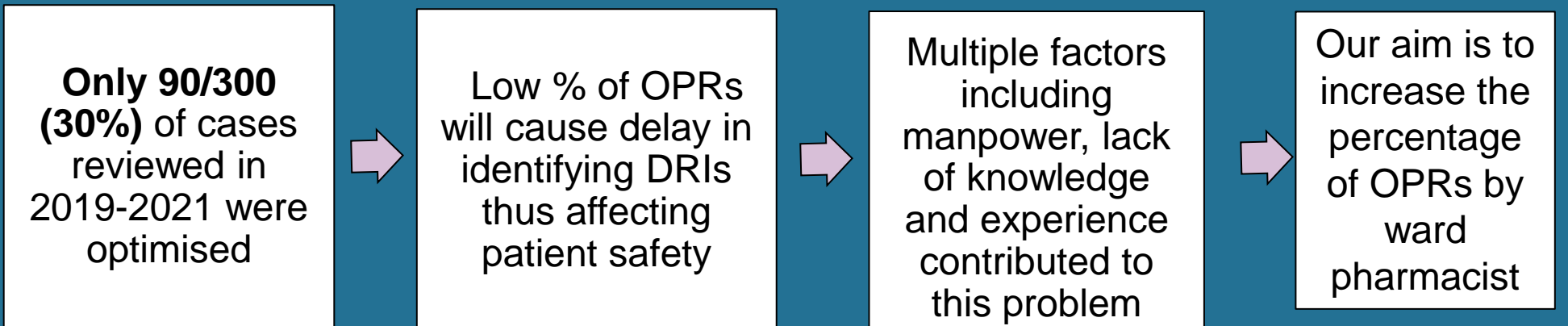|	PROBLEM	S	M	A	R	T	SCORE
1	High percentage of inappropriate usage of antibiotic in medical wards	18	13	15	16	14	76
2	Low percentage of pharmacotherapy review transfer among ward pharmacists in medical wards HKL	10	12	14	11	13	60
3	Low percentage of optimised Pharmacotherapy Review (OPR) by ward pharmacists in medical wards HKL	18	17	15	16	15	81

GROUP MEMBERS: 7

RATING SCALE:
1: LOW   2: MEDIUM   3: HIGH

1.2 REASON FOR SELECTION

S SERIOUSNESS
Low percentage of OPRs may lead to low number of DRIs detection which may cause harm toward patients

M MEASURABLE
Number of OPRs can be measured

A APPROPRIATENESS
More DRIs can be detected and intervened by increasing the number of OPRs

R REMEDIABLE
Remediable by implementing appropriate strategies to improve the work process

T TIMELINESS
The project can be completed within 1 year

1.3 PROBLEM STATEMENT

Only 90/300 (30%) of cases reviewed in 2019-2021 were optimised → Low % of OPRs will cause delay in identifying DRIs thus affecting patient safety → Multiple factors including manpower, lack of knowledge and experience contributed to this problem → Our aim is to increase the percentage of OPRs by ward pharmacist

1.4 LITERATURE REVIEW

A **pharmaceutical care service (PCS)** and the integration of pharmacists into the health care team is a key strategy **to identify and resolve DRIs** [1]

Integration of PCS by ward pharmacist involved in patient care resulted in a **reduction of DRIs** and **improvement in patient safety** [2]

In a highly active ward, pharmacists' pharmaceutical care needs must be **assessed and prioritised** accordingly to reduce DRIs [3]

1.5 PROBLEM ANALYSIS CHART
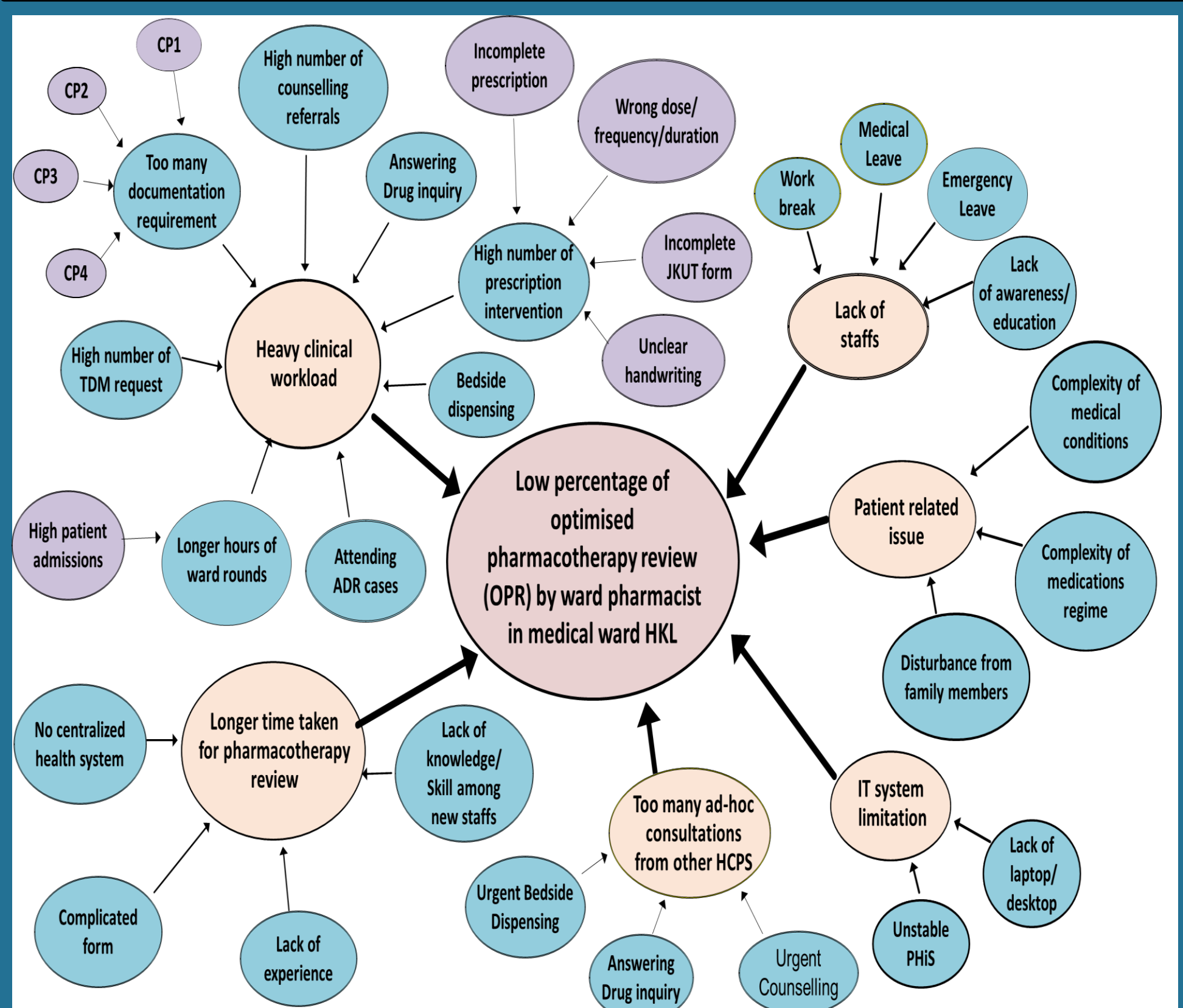
1.6 TERMS AND DEFINITIONS

PHARMACOTHERAPY REVIEW (PR)

Scan QR for CP2 documentation

Review done by ward pharmacist using CP2 documentation form which can help in detecting drug related issues (DRIs)

OPTIMISED PHARMACOTHERAPY REVIEW (OPR)

PR by ward pharmacist based on patient's acuity level which includes the following criteria: drugs that require close monitoring, therapeutic drug monitoring, organ dysfunction, specialty care referral, intensive/critical care transition, medication related issues, high alert medications & patient related issues

2.0 KEY MEASURES FOR IMPROVEMENT

2.1 STUDY OBJECTIVES

GENERAL OBJECTIVE
To increase the percentage of OPR by ward pharmacists in medical wards HKL

SPECIFIC OBJECTIVES
1. To determine the percentage of OPR by ward pharmacists in medical wards HKL
2. To identify the causative factors that lead to low percentage of OPR by ward pharmacist in medical wards HKL
3. To formulate and implement the remedial measures to increase percentage of OPR by ward pharmacist in medical wards HKL
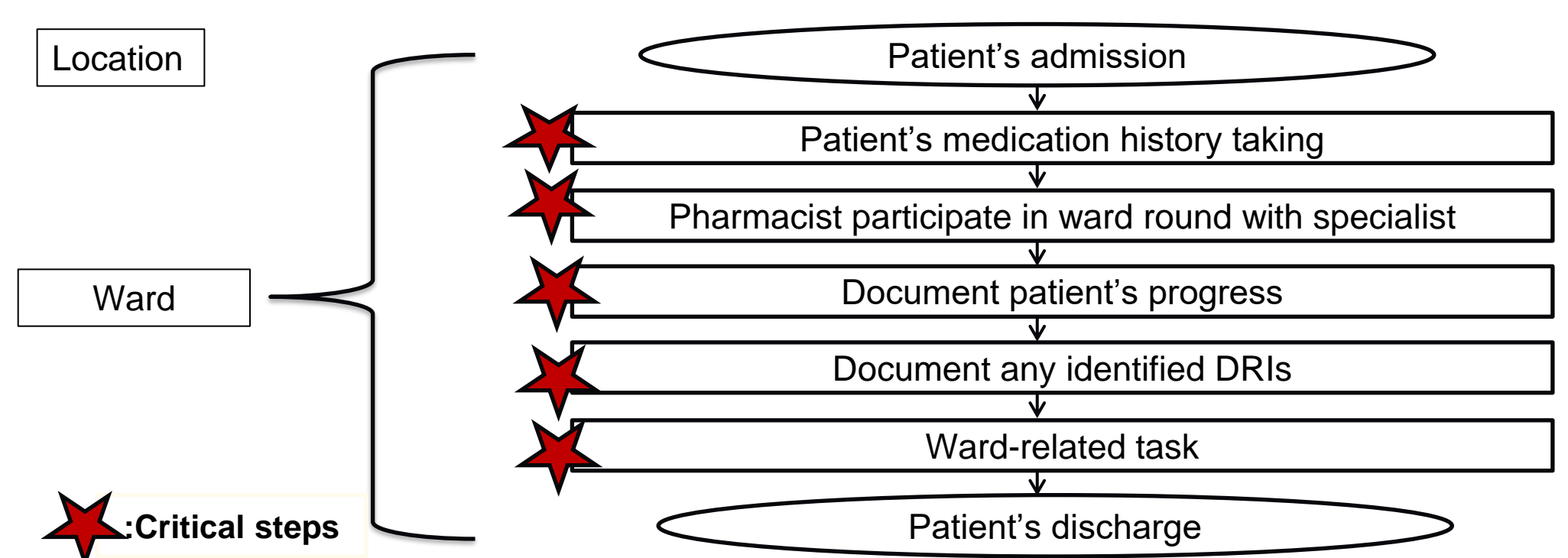4. To re-evaluate the effectiveness of the remedial measures taken

2.2 STANDARD AND INDICATOR

INDICATOR

Percentage (%) of Optimised Pharmacotherapy Review (OPR) by Ward Pharmacist in Medical Wards HKL

$$\frac{\text{Total number of Optimised Pharmacotherapy Review}}{\text{Total number of Pharmacotherapy Review}} \times 100\%$$

STANDARD: 100%
[Standard set during Pharmacotherapy Division Meeting in HKL 2023]

2.3 PROCESS OF CARE

Location / Ward

Patient's admission
Patient's medication history taking ★
Pharmacist participate in ward round with specialist ★
Document patient's progress ★
Document any identified DRIs ★
Ward-related task ★
Patient's discharge

★ - Critical steps

2.4 MODEL OF GOOD CARE

No	Process	Criteria	Standard	Verification	Cycle 1	Cycle 2
1.	Patient's medication history taking	Retrieve relevant information from case notes, medication chart, laboratory data, referral / discharge notes:	100%	95%	97%	98.5%
		a) Chief complaint	100%	100%	100%	100%
		b) History of presenting illness	100%	100%	100%	100%
		c) Past medication history	100%	100%	100%	100%
		d) Diagnosis/surgical history	100%	95%	96%	97%
		e) Social history	100%	97%	97%	97.5%
		f) Allergy history	100%	99%	99%	100%
2	Pharmacist participate in ward round with Specialist	Patient medications management: a) Medication screening b) Medication enquiry c) Treatment plan	100%	95%	95%	96.5%
3	Document the patient's progress	Pharmacotherapy Review (Refer Strategy 5.1)	100%	56.41%	79.4%	94%
		a) Chief complaint	100%	100%	100%	100%
		b) History of presenting illness	100%	98%	98%	99%
		c) Past medication history	100%	97%	97%	97.5%
		d) Diagnosis/surgical history	100%	95%	95%	97%
		e) Social history	100%	90%	94%	97%
		f) Allergy history	100%	98%	98%	99%
		g) Laboratory investigations	100%	100%	100%	100%
		h) Ward Medications	100%	100%	100%	100%
		i) Pharmaceutical Care Issues	100%	42.7%	78.4%	97.8%
4.	Document any identified DRIs	a) Interventions/Request Encountered (Refer Strategy 5.2)	100%	42.7%	78.4%	97.8%
		b) Description of Requests / Intervention Encountered	100%	95%	95%	96.5%
		c) Follow up required	100%	90%	90%	95%
5.	Ward-related tasks	a) Discharge Dispensing	100%	90%	94%	97%
		b) Bedside Counseling	100%	95%	97%	98.5%
		c) Attending TDM request	100%	100%	100%	100%
		d) Identify and report ADR	100%	98%	98%	99%

## 3.0 PROCESS OF GATHERING INFORMATION

3.1 METHODOLOGY

Study Design	Cross sectional Study (Quasi experimental study design)
Location	Active medical ward in Main Block HKL (5 wards – 152 beds)
Study Duration	Verification: 3 month (1/08/2023-31/10/2023) (Sample size=195) Cycle 1: strategy for change(1/11/2023-31/3/2024)(Sample size=306) Cycle 2 : strategy for change(8/4/2024 -8/8/2024) (Sample size=384)
Study Sample	Patient in active/stable medical ward
Sampling technique	Convenient Sampling Sampling size : 300 (Raosoft)/ 10= 30 per pharmacist per month
Inclusion criteria	All PRs by ward pharmacist
Exclusion Criteria	Passive and critical medical wards (5 wards) Wards without ward Pharmacists (4 wards)

3.2 DATA COLLECTION TOOL

DATA COLLECTION FORM
Data collection form to determine the average time for 1 PR

QUESTIONNAIRE FOR WARD PHARMACIST
Questionnaire to determine common drug consultations required by healthcare professionals during PR
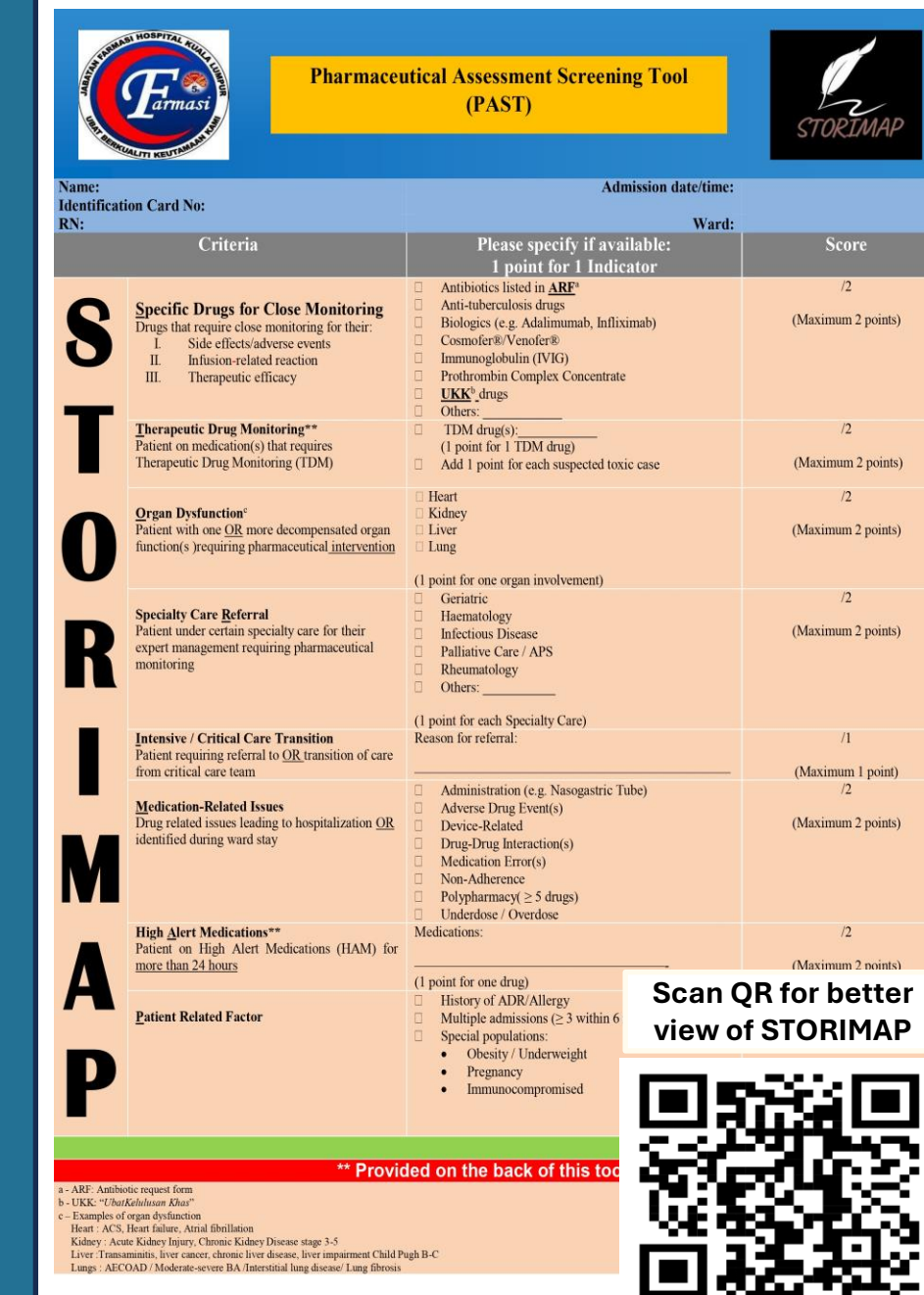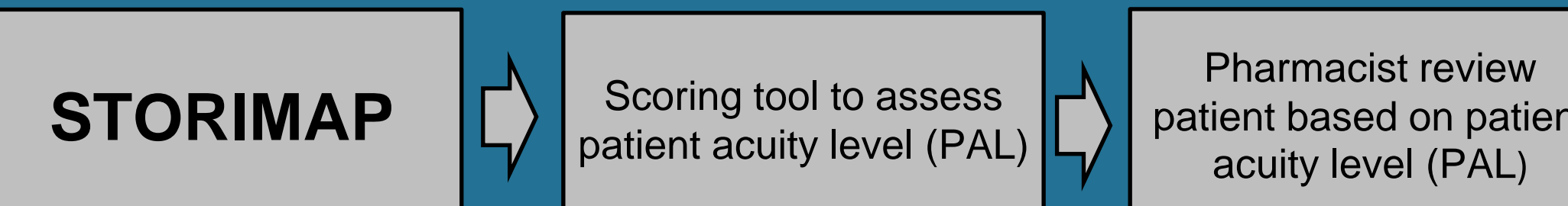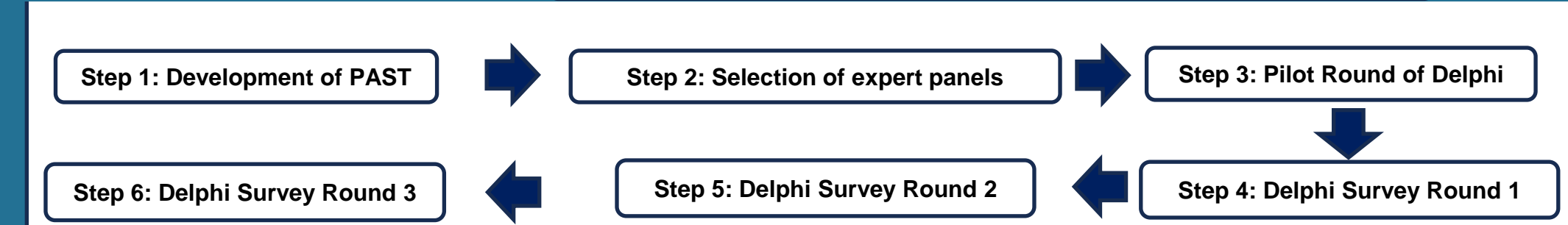
4.0 ANALYSIS & INTEPRETATION
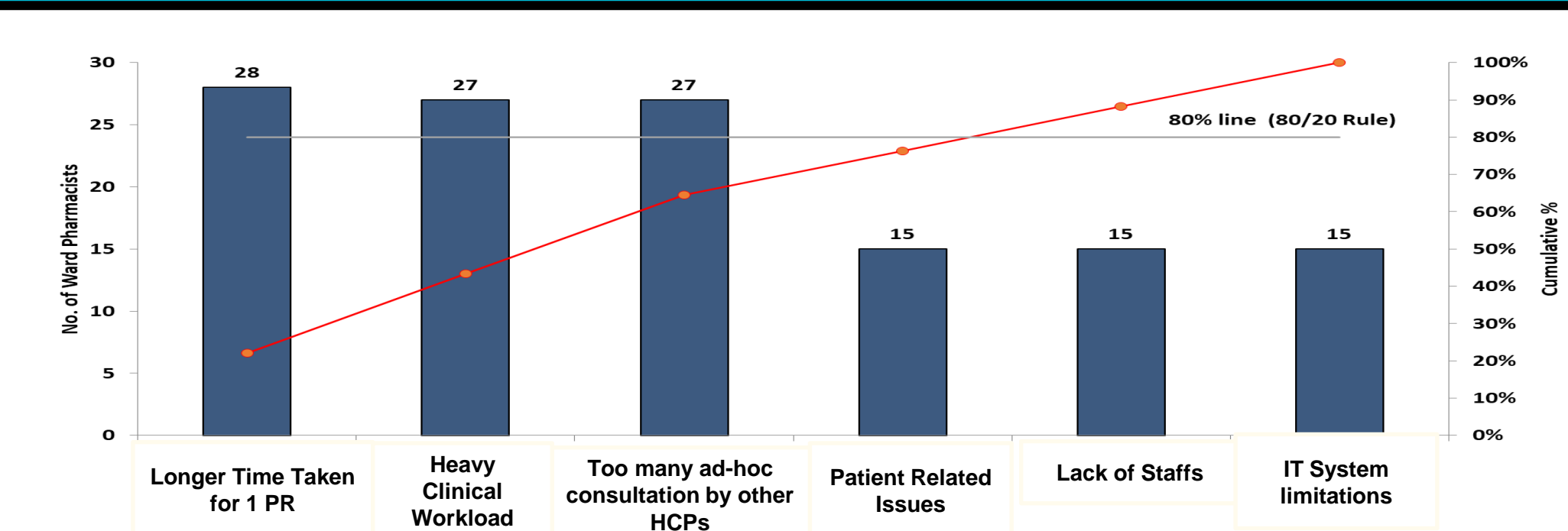
5.0 STRATEGIES FOR CHANGE

5.1 Pharmacist Assessment Screening Tool (PAST): STORIMAP (NMMR-21-27-57897)

Problem: Longer time to do 1 Pharmacotherapy Review (PR) and Heavy Clinical Workload
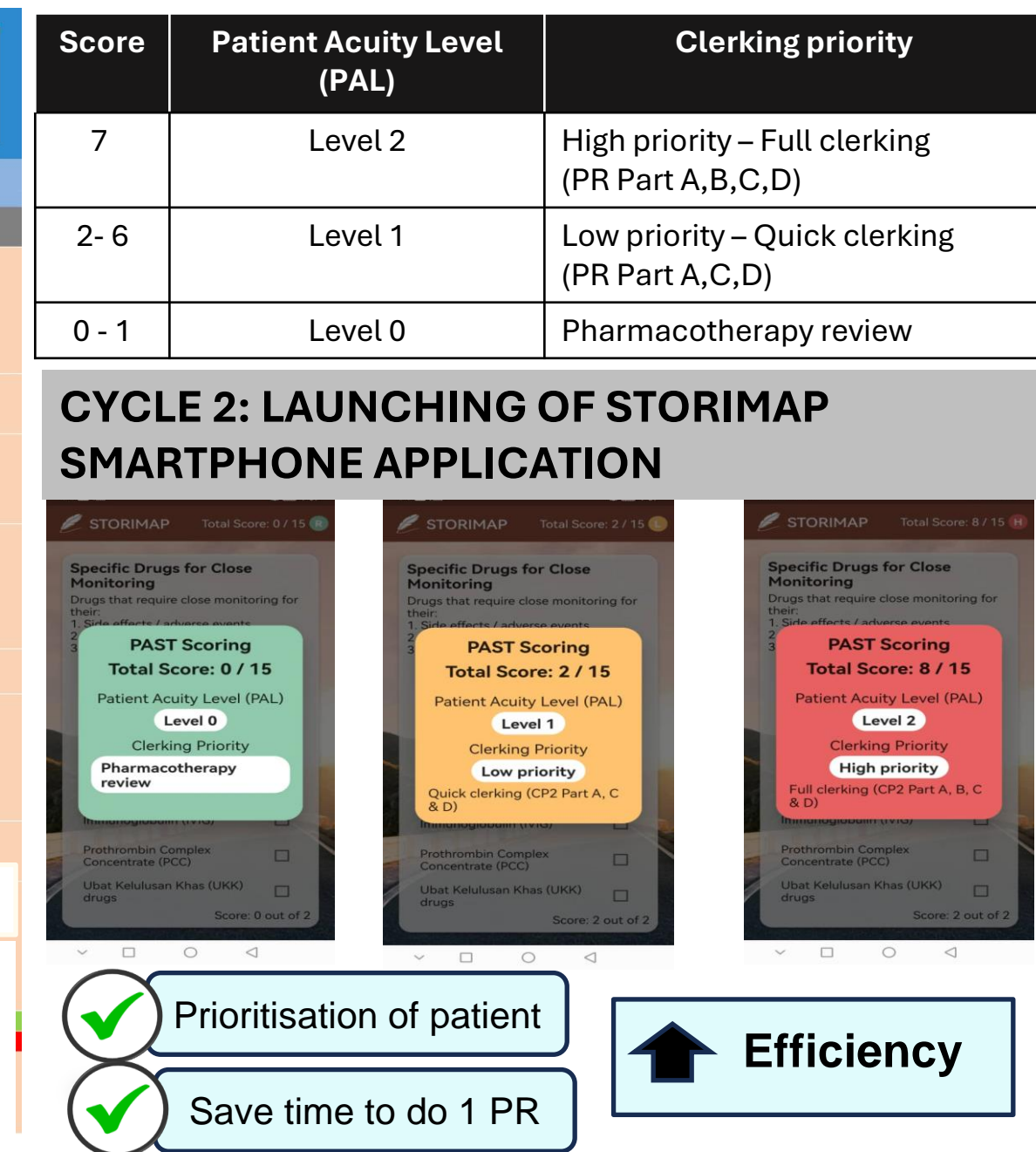
STORIMAP → Scoring tool to assess patient acuity level (PAL) → Pharmacist review patient based on patient acuity level (PAL)

CYCLE 1: STORIMAP — Development of STORIMAP

Step 1: Development of PAST → Step 2: Selection of expert panels → Step 3: Pilot Round of Delphi → Step 4: Delphi Survey Round 1 → Step 5: Delphi Survey Round 2 → Step 6: Delphi Survey Round 3

Scan QR for better view of STORIMAP

Score	Patient Acuity Level (PAL)	Clerking priority
7	Level 2	High priority – Full clerking (PR Part A,B,C,D)
2 - 6	Level 1	Low priority – Quick clerking (PR Part A,C,D)
0 - 1	Level 0	Pharmacotherapy review

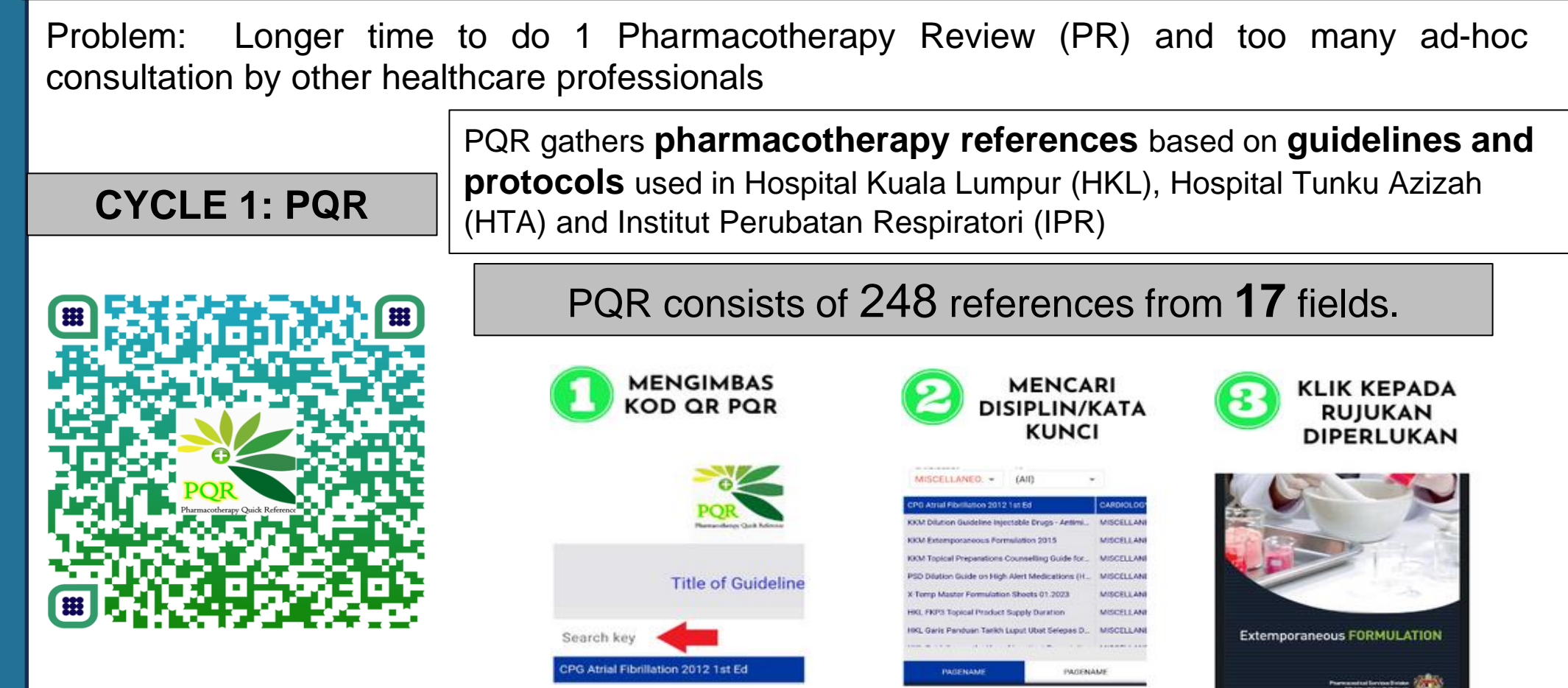### CYCLE 2: LAUNCHING OF STORIMAP SMARTPHONE APPLICATION

✓ Prioritisation of patient
✓ Save time to do 1 PR
Efficiency

5.2 Pharmacotherapy Quick References (PQR)

Problem: Longer time to do 1 Pharmacotherapy Review (PR) and too many ad-hoc consultation by other healthcare professionals

CYCLE 1: PQR

PQR gathers **pharmacotherapy references** based on **guidelines and protocols** used in Hospital Kuala Lumpur (HKL), Hospital Tunku Azizah (HTA) and Institut Perubatan Respiratori (IPR)
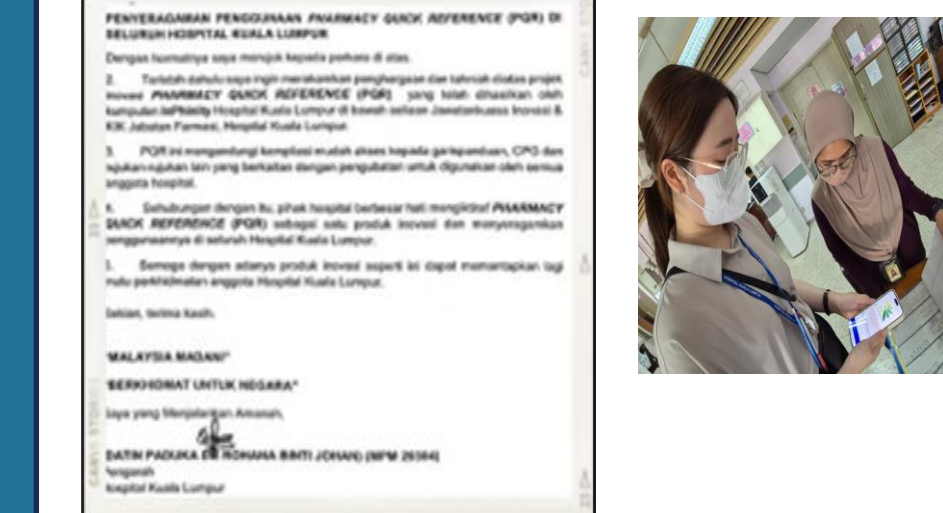
PQR consists of 248 references from **17 fields**.

1 MENGIMBAS KOD QR PQR
2 MENCARI DISIPLIN/KATA KUNCI
3 KLIK KEPADA RUJUKAN DIPERLUKAN

CYCLE 2: EXPANSION OF PQR TO OTHER HEALTHCARE PROFESSIONALS

✓ Shorten time to answer query
✓ Quality answer provided
Efficiency

5.3 Continuous Pharmacist Education (CPE):

Training and advocating the use of STORIMAP and PQR

6.0 EFFECTS OF CHANGE

6.1 ABNA (Achievable Benefit Not Achieved)

Ideal 100 | Standard 100 | Verification Study 56.4 (ABNA 43.6%) | Cycle 1 79.4 (ABNA 20.6%) | Cycle 2 94 (ABNA 6%)

Percentage of Optimised Pharmacotherapy Review(%)

Figure 1 : Percentage of OPR and DRI

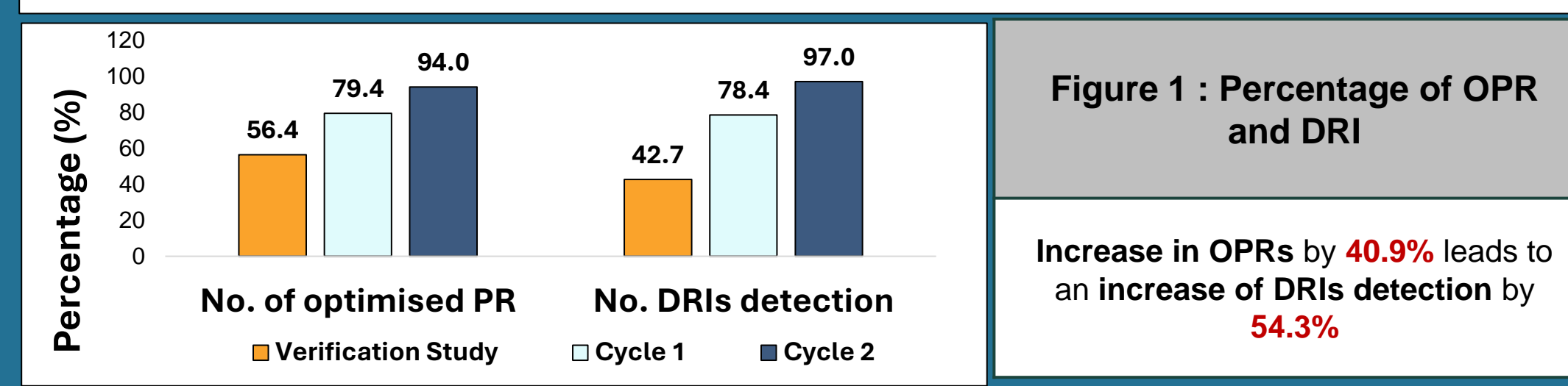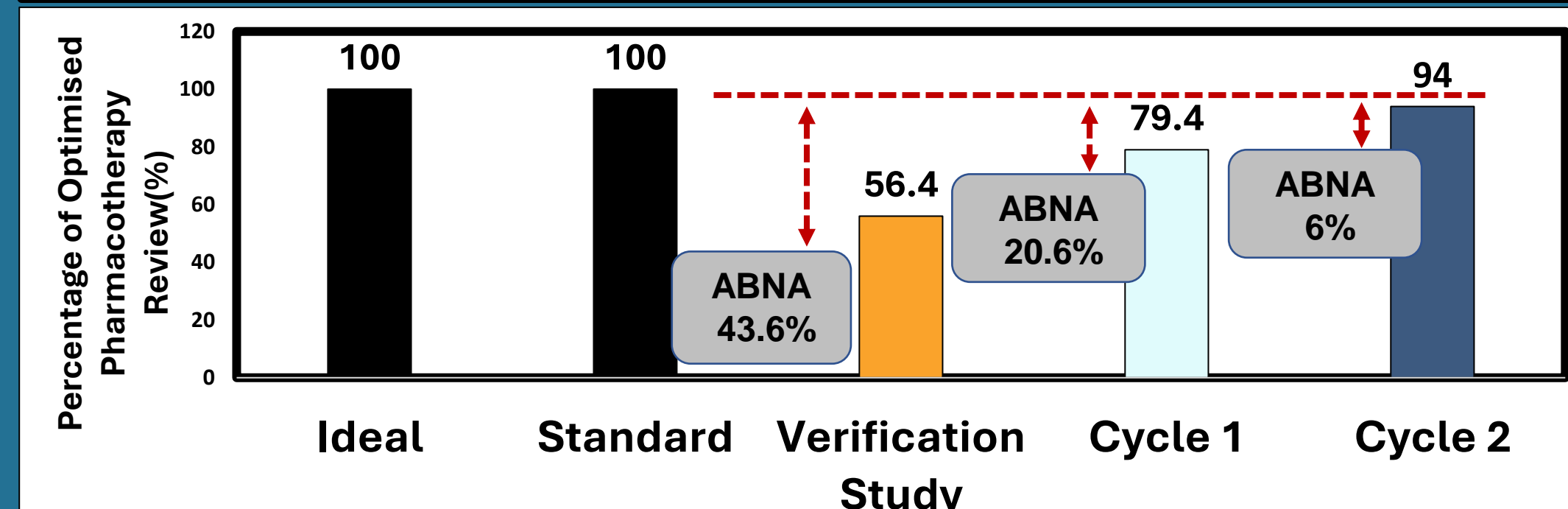Increase in OPRs by **40.9%** leads to an **increase of DRIs detection by 54.3%**

FIGURE 2 & 3 : Average time taken for OPRs & Information Search

Reduction in average time taken for PR and information search leads to increase OPRs and DRIs detection

Fig.2 Average time taken for OPR — Verification Study 38, Cycle 1 15, Cycle 2 10

Fig.3 Average time taken for information search — Before PQR 16, Cycle 1 9, Cycle 2 9

Figure 4 : Impact on Patient Care

Increase in OPRs → Quick corrective measure with early detection of DRIs →
- Helps in **preventing patient deterioration & transfer** to **critical care unit** by average of **8 to 6 patients/ward/month**
- Increase in **near miss error** detection 353 to 408/month
- Increase in ADR reporting from 2 to 8 ADR/month
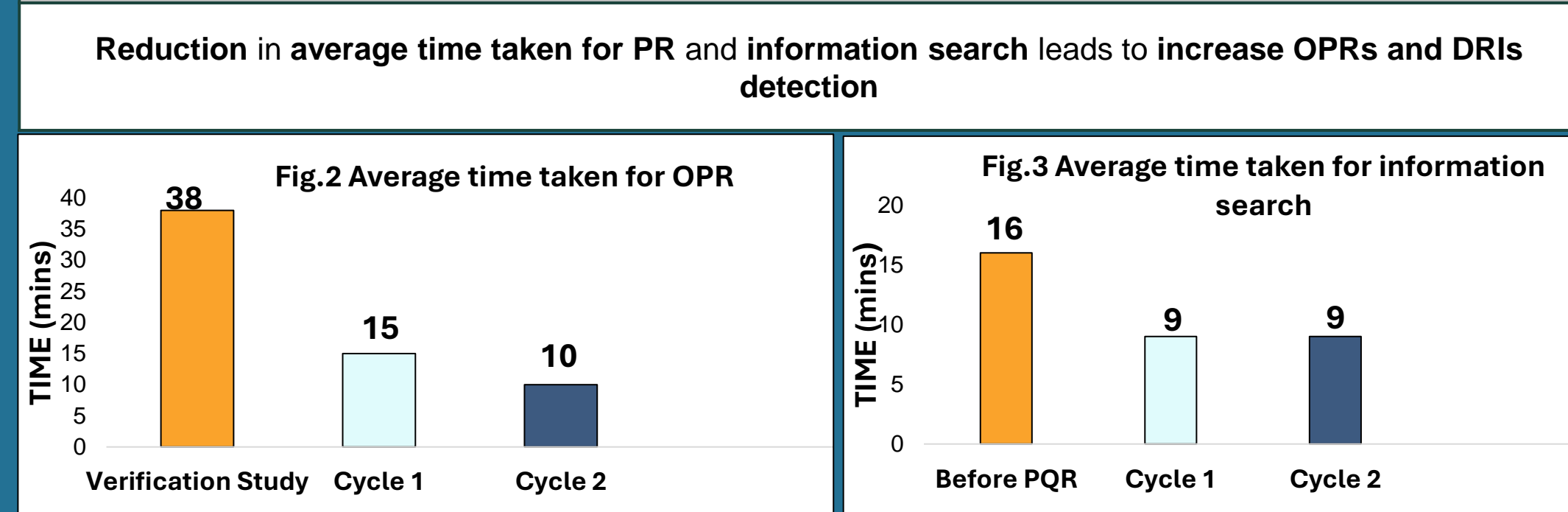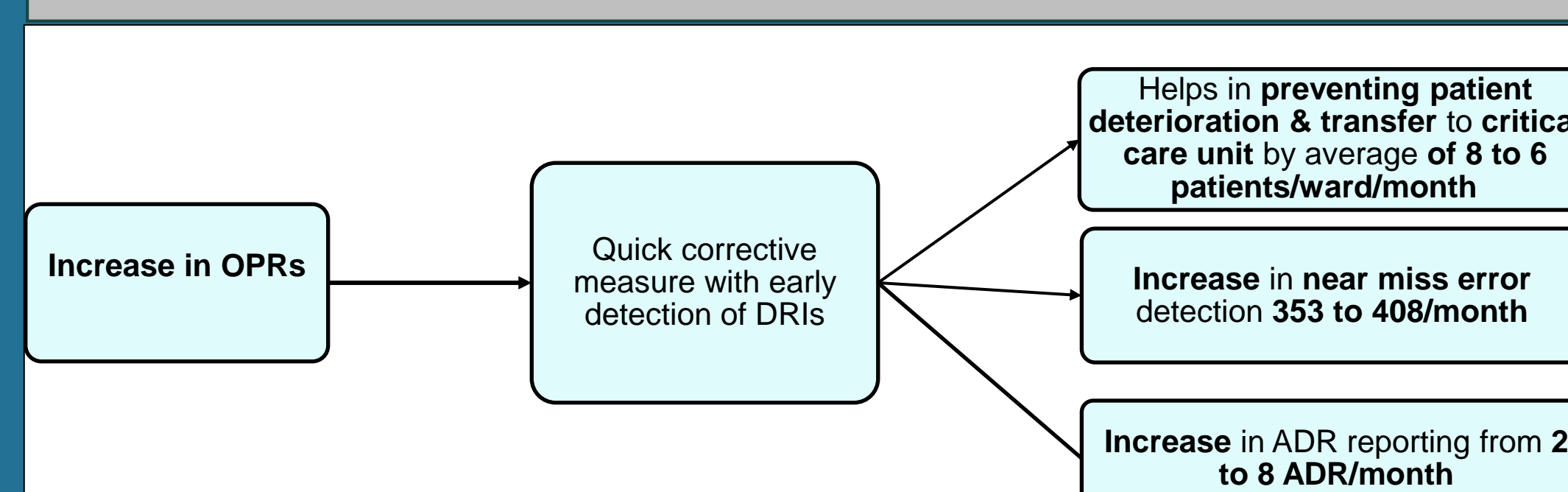
6.2 LESSON LEARNT

STORIMAP & PQR aids ward pharmacists in prioritising patients for tailored pharmacotherapy services, optimising time utilization, accelerating response times to inquiries from healthcare professionals, and facilitating the detection of more DRIs, thereby enhancing patient safety and treatment efficacy

7.0 NEXT STEP

Moving forward, STORIMAP has been presented to Program Perkhidmatan Farmasi and in the process of implementing STORIMAP across the country by integrating it into the Ward Pharmacy Guideline Pharmaceutical Service Division, Ministry of Health

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1. World Health Organization. The third WHO global patient safety challenge: medication without harm. http://www.who.int/patientsafety/medication-safety/en/ (2017).
2. Peterson, C. & Gustafsson, M. Characterisation of drug-related problems and associated factors at a clinical pharmacist service-naive hospital in Northern Sweden. Drugs Real World Outcomes 4(2), 97–107 (2017).
3. Vikit, K. K. & Blix, H. S. The impact of clinical pharmacists on drug-related problems and clinical outcomes. Basic Clin. Pharmacol. Toxicol. 102(3), 275–280 (2008).
4. Falconer N, Liow D, Zeng I, Parsotam N, Seddon M, Nand S. Validation of the assessment of risk tool: patient prioritisation technology for clinical pharmacist interventions. European Journal of Hospital Pharmacy. 2017;24(6):320–6. doi: 10.1136/ejhpharm-2016-001165 · DOI · PMC · PubMed