Pengelolaan Pasien dengan Penyakit Kronis (NCD) di Rumah Sakit di Malaysia

Beyond Dispensing: The Pharmacist as a Clinical Non-Communicable Disease (NCD) Manager in the Digital Age

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Session Roadmap: Our Journey Together

OVERVIEW

PART 1 & 2

The Why & The Context

The shared NCD burden and the patient experience.

Slides 3-7

PART 3 & 4

The Enablers

The economic case and the digital backbone (HIS/PHIS).

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The National Vision & Clinical Services

Malaysia's blueprint and end-to-end pharmaceutical care.

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The Pillars of Quality

Medication safety, stewardship, legal frameworks, guidelines, CPGs, and MSQH standards.

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The Action Plan

Proven Malaysian innovations you can adapt tomorrow.

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A Mirror, Not a Window — Malaysia & Indonesia on Parallel Paths

Indicator	Malaysia	Indonesia
Diabetes Prevalence	17.5% of adults (NHMS 2023)	10.9% of adults (Riskesdas 2018)
Adults with Diabetes	~4.0 million	~21.8 million
Hypertension	29.3%	34.1%
Overweight or Obese	54.4%	35.4%

The Takeaway

"Same storm, different boats, same crew."

The parallel paths of our populations demand structurally similar solutions that look beyond traditional boundaries.

The Overwhelming Burden of Non-Communicable Diseases (NCDs)

17.5%

DIABETES MELLITUS

Of the adult population currently diagnosed.

29.3%

HYPERTENSION

Live with high blood pressure.

54.4%

OVERWEIGHT / OBESE

At elevated risk for cardiovascular events.

2.3M

MULTI-MORBIDITY

Malaysians live with three NCDs simultaneously.

Beyond Diabetes and Hypertension: The Full NCD Spectrum

Four Major NCD Groups (WHO)

- **Cardiovascular Diseases:** Heart disease, stroke, hypertension.
- **Diabetes Mellitus:** Type 1, Type 2, gestational.
- **Chronic Respiratory Diseases:** Asthma, COPD.
- **Cancers:** Chemotherapy care, oncological support services.

Other Chronic Conditions

- Mental health disorders
- Chronic Kidney Disease (CKD)
- Musculoskeletal conditions
- Neurodegenerative disorders

Why This Matters: The models we discuss apply across ALL these conditions.

The Patient Experience — "Snapshot Medicine"

01

Wait Time

Waits 3 hours in a crowded clinic.

Wastes a full day.

02

Consultation

5-minute consultation with physician.

Too rushed.

03

Metric Capture

Single blood sugar check.

One number for 3 months.

04

Dispensation

3-month medication refill.

No adherence check.

The Result: "One blood sugar reading represents three months of living."

A Day in the Life: The Hospital Pharmacist in Malaysia

800 - 1,200

PRESCRIPTIONS / DAY

In a major public hospital pharmacy.

< 90 seconds

COUNSELLING TIME

Average contact time per clinical exchange.

The "Checking Clerk" Trap

Clinical skills of trained pharmacy professionals are easily eroded by the heavy operational demands of logistics and administrative processing.

The Dream: 80% clinical counselling / 20% logistics.

Understanding Indonesia's Healthcare & Pharmacy Landscape

The Scale & Challenge

- 17,000+ islands
- 21.8M adults with diabetes
- Pharmacist shortage
- Telemedicine leapfrogging

The System Structure

- JKN/BPJS (250M+ lives)
- Puskesmas & PROLANIS
- Fornas & e-Katalog
- SATUSEHAT Platform

The Pharmacy Landscape

- Public Hospital Pharmacy
- Private Hospital Pharmacy
- Puskesmas Pharmacy
- Apotek (Community)

The Opportunity: JKN + SATUSEHAT + ojol = unparalleled platform for pharmacist-led NCD care.

The Economic Case for Pharmacist-Led NCD Management

RM 100.79B

DIRECT NCD COSTS

Represents 5.81% of Malaysia's gross domestic product (GDP).

Admissions Prevention

Every Ringgit invested in MTAC (Medication Therapy Adherence Clinic) saves multiples in prevented downstream clinical admissions.

Key Message: Better care = more sustainable health financing

Beyond the Bedside – Pharmacist as Budget Guardian & Access Enabler

PART 3: THE ECONOMIC IMPERATIVE

Role	What the Pharmacist Does	Impact on NCD Patients
Value-Based Medicine (VBM)	Select drugs with best clinical outcomes per cost. Use pharmacoeconomic data (QALY, ICER) in Pharmacy & Therapeutics (PTC) decisions.	Ensures chronic patients get effective, affordable drugs – not just cheap or expensive ones.
Centralised Procurement	Aggregate demand across hospitals to negotiate lower prices. Standardise quality specifications (bioequivalence, stability).	Reduces drug shortages and out-of-pocket costs for lifelong NCD medications (e.g., insulin, statins, antihypertensives).
Patient Assistance Programmes (PAP)	Evaluate and manage manufacturer offers: buy-one-free-one, volume discounts, free drug donations, co-pay cards. Track real utilisation to prevent waste.	Expands access to costly NCD drugs (e.g., novel antidiabetics, oral chemotherapy, biologics) for low-income and uninsured patients.
Formulary & Tender	Lead drug selection committees. Use evidence-based, cost-conscious formularies guided by national CPGs. Monitor generic uptake and therapeutic substitution.	Prevents stockouts of essential NCD medicines. Keeps formularies up-to-date and financially sustainable.

The Bottom Line: "A good pharmacist saves lives. A great pharmacist saves lives AND budgets."

The Digital Backbone – Enabling Clinical Pharmacy

The Honest Truth: Our Systems Work, But They Don't Talk to Each Other

What We Have	The Problem	How We Manage It
HIS (Hospital Information System - Patient data)	Systems don't share data automatically. Two separate truths.	**"Swivel-Chair Integration"** – manual dual-system data entry.
PHIS (Pharmacy Information System - Medication data)		**"Truth-Teller" Rule** – establish exactly one master system per operational function.

The Bottom Line: "You don't need perfect IT to start. You need good SOPs."

What a Pharmacy Information System (PHIS) Should Do

Safety First

- Flags drug-drug interactions.
- Alerts for high-risk medications.
- Forces mandatory double-check workflows.

Logistics That Work

- Real-time stock inventory visibility.
- Systematic alerts prevent stock-outs.
- Tracks from central store to target patient.

Enabling Clinical Care

- Complete medication history accessible.
- Supports MTAC structures.
- Enables V-MAC & UMP integration.

The Bottom Line: "Safety, logistics, and clinical enablement are the goals. Technology is just the tool."

An Honest Appraisal of PHIS: Strengths, Weaknesses, and Roadmap

✅ What Works Well

- Integrated clinical safety check engine.
- Provides complete audit trail of transactions.
- Successfully enables clinical execution of MTAC, V-MAC, and UMP.
- Complex inventory management tracking is functional.

❌ What Doesn't

- Legacy interface is cumbersome with too many operational clicks.
- No automated cross-platform data sharing.
- Does not capture private hospital patient data.
- No consolidated national pharmacy reporting suite.

🗺️ What We Must Fix

- Create functional bi-directional communication between HIS & PHIS.
- Modernise overall user interface (UI).
- Connect and capture private sector dispensing transactions.
- Build a National Pharmacy Data Repository for epidemiological data.

The Vision: "One Citizen, One Record"

Seamless Integration

Our strategic national blueprint calls for a **single, lifelong, interoperable health record** for every Malaysian.

This vision bridges public and private boundaries to establish a continuous clinical narrative for NCD management.

MOH Rollout Targets (By 2029)

Target: All 150 MOH public hospitals + 3,000 primary care clinics.

Phased Rollout Timeline:

2026: 16 **2027: 25** **2028: 46** **2029: 49**

Key Systems: EMR & CCMS

Hospital EMR

The Digital Backbone for Secondary/Tertiary Hospitals

Designed to consolidate clinical patient records, operational order workflows, lab diagnostics, imaging, and surgical notes within the hospital ecosystem.

CCMS (Cloud-Based Clinical Management System)

Cloud-Based Platform Tailored for Primary Care Clinics

Enables real-time, lightweight diagnostic and pharmaceutical management across rural and urban community clinics. Currently active in 160 clinics, moving to 3,000 by 2029.

Beyond Infrastructure — AI, Analytics, and Registries

AI Models

Diagnostic tools to support active clinical checks.

Example: DR.MATA

Utilises predictive imaging for diabetic retinopathy and leprosy analysis.

TRE

Trusted Research Environment

Anonymised clinical database infrastructure allowing safe analytical checks without exposing protected patient identifiers.

Registries

Consolidated real-world data tracking patient treatment adherence, demographic distributions, and outcomes.

National Diabetes Registry

Critical tool for mapping population-level therapeutic outcomes.

The Untapped Potential: A National Pharmacy Data Set

⇄ Current vs Vision

Current: PHIS data remains siloed within individual hospital sites.

Vision: Consolidated national dataset of anonymised dispensing transactions from all healthcare facilities.

Intended Clinical Use Cases

- **Early Warning System:** Identifying regional drug stockouts.
- **Adherence Heat Map:** Target resources to poor-adherence zones.
- **Pharmacovigilance:** Rapid detection of rare adverse drug reactions.

Question for Indonesia: Could SATUSEHAT be the foundation for this?

One Patient, Many Touchpoints: End-to-End Pharmacy Services

1. Admission
Inpatient Pharmacy Services, Tracing Past Medication History via **CP1 Form**.

2. During Stay
Clinical Pharmacy Ward Round, Bedside Counselling, and Therapeutic Drug Monitoring (TDM).

3. Discharge
Medication Reconciliation, Home Medication Review (HMR), Bedside Dispensing.

4. Post-Discharge (Clinic)
Medication Therapy Adherence Clinic (MTAC): Warfarin, Diabetes, Retroviral Disease, Hemophilia, Thalassemia.

5. Post-Discharge (Counselling)
Patient Medication Counselling (PMC), Medication Therapy Management (MTM).

6. Remote Follow-Up
Virtual Medication Counselling (VMC), Telemedicine Clinic.

7. Ongoing Support
National Pharmacy Call Centre (NPCC).

8. Refill (Stable)
Ubat Melalui Pos (UMP), SPUB, Drive-through, and Locker4u.

The Bottom Line: "Every touchpoint is a pharmacist. This is the end-to-end vision — from admission to home delivery."

Specialised Clinical Roles — Beyond Dispensing

☢ Nuclear Pharmacist

- Prepares radiopharmaceuticals for PET/CT, SPECT.
- Calculates radioactive dosages accurately.
- Ensures strict radiation safety and shielding.
- Documents decay calculations.
- Disposes of radioactive waste according to standards.

☣ Cytotoxic Drug Prep Pharmacist

- Prepares IV and oral chemotherapy under safe isolation.
- Calculates doses based on Body Surface Area (BSA).
- Maintains aseptic technique using biosafety cabinets.
- Wears full PPE (gown, gloves, mask).
- Double-checks every single dose with another pharmacist.

Why It Matters: "Cancer is a major NCD. A single error in chemotherapy dosing can be fatal. These specialised pharmacists are the last line of defence."

Specialised Services & Quality Standards

Part A: Specialised Services

Total Parenteral Nutrition (TPN)
Compounding of clinical nutrition infusions under absolute aseptic conditions.

Extemporaneous Preparation
Formulating customized syrups, powders, or topical preparations when commercial doses are unavailable.

Part B: MSQH Key Pharmacy Standards

- Medication Management & Use
- Patient Counselling
- High-Alert Medications
- LASA Identification
- Medication Reconciliation
- ADR Reporting
- Expiry & Stock Management

The Takeaway: "MSQH standards align with JCI and ISQua."

Medication Safety — Near Miss, Error Reporting & Committee

PART 7: MEDICATION SAFETY & STEWARDSHIP

Term	Definition	Pharmacist's Role
Near Miss	Error caught before reaching the patient.	Document every near miss. Analyse root cause. Implement system changes. Note: Guided by the National Medication Error Reporting Guideline (Pharmaceutical Services Programme, MOH) and Guideline on Safe Use of High-Alert Medications.
Medication Error	Error that reaches the patient.	Immediate patient safety intervention. Complete incident report within 24 hours.
Med Error Committee	Multidisciplinary team reviewing errors.	Pharmacist must be a core member. Present pharmacy-reported errors. Recommend system changes based on root cause analysis methodology from national guidelines.
Reporting Culture	"Just culture" — no punishment for reporting.	Lead by example. Report your own near misses. Emphasise that reporting prevents future harm.

The Bottom Line: "Every near miss is a learning opportunity. Report it. Fix the system. Prevent future harm."

Antimicrobial Stewardship, Antibiotic Resistance & Generic Use

PART 7: MEDICATION SAFETY & STEWARDSHIP

A. Antimicrobial Stewardship

- **Review daily:** Is it needed? Right drug? Right dose?
- **Time-out:** Mandatory review after 48-72 hours.
- **Restrict:** Approval for last-line carbapenems/colistin.
- **IV-to-Oral:** Switch when clinically appropriate.
- **OPAT:** Daily clinic visits for IV completions.

Ref: National Antimicrobial Guideline (MOH)

B. Antibiotic Resistance

- Advocate for culture & sensitivity testing before initiating antibiotics whenever possible.
- De-escalate based on lab results (broad to narrow spectrum).
- Educate prescribers on hospital-specific antibiograms.
- Utilisation monitoring via DDD checks.

C. Generic Drug Use

- Dispense generic by default: same active ingredient, strength, and dosage form.
- Educate patients that generics are safe, effective, and 50-80% cheaper.
- Advocate for generic-first formularies in partnership with the P&T Committee.

The Bottom Line: "Pharmacists are the guardians of rational drug use — antibiotics, generics, and beyond."

Legal Framework for Pharmacy Services in Malaysia

Core Message: Multiple Acts govern pharmacy practice and directly impact chronic patient management.

Act	Purpose	Relevance to Chronic (NCD) Patient Management
Poisons Act 1952	Regulates importation, possession, manufacture, compounding, storage, transport, sale, and use of poisons.	Controls dispensing of prescription medicines (e.g., antibiotics, antihypertensives, diabetes medications). Section 12 requires poisons to be dispensed only by registered pharmacists or under their supervision.
Dangerous Drugs Act 1952	Controls importation, exportation, manufacture, sale, and possession of dangerous drugs.	Governs strong painkillers (morphine, fentanyl) for cancer pain and palliative care. Regulation 8 authorizes registered pharmacists in public institutions to supply these drugs.
Act 586 (Private Healthcare Act)	Licensing and regulation of private hospitals and healthcare facilities.	Requires pharmacy services to be led by a registered pharmacist as head of department, supported by sufficient, competent staff. Establishes standards for secure storage (locked cabinets); Cold Chain Management (insulin); accurate labelling with clear instructions; Prescription Book for poisons audit trail; and proper disposal of expired or contaminated drugs.
Medicines Act 1956	Prohibits false or misleading advertisements of medicines and regulates sale.	Protects patients from misleading claims about 'cures' for NCDs. Section 3 prohibits advertisements claiming treatment for cancer, diabetes, heart disease, etc. without approval.
Sale of Drugs Act 1952	Controls the sale of drugs that are unwholesome or deleterious to health.	Ensures patients receive medications that are safe, effective, and not contaminated. Grants enforcement powers to inspect and seize non-compliant drugs.

Beyond Legislation — Guidelines, CPGs & Professional Standards

The Three Layers of Governance

- **Legislation:** Poisons Act 1952, Act 586. *Force: Mandatory.*
- **Professional Standards:** Good Dispensing Practice, MSQH Standard 18. *Force: Required for licensure.*
- **Clinical Practice Guidelines (CPGs):** Disease algorithms. *Force: Advisory, sets standard of care.*

How Pharmacists Use CPGs in Daily NCD Practice

- **Metformin + Gliclazide, HbA1c 8.5%:** Recommend adding SGLT2-i or DPP4-i per CPG Diabetes algorithm.
- **Amlodipine 5mg, BP 150/95:** Suggest uptitration to 10mg or adding ACE-I/ARB per CPG Hypertension stepwise approach.
- **Atorvastatin 20mg, LDL-C off target:** Suggest high intensity statin per CPG Dyslipidaemia.

"Acts give pharmacists authority. Guidelines tell them the process. CPGs tell them the clinical decision."

CPGs define the accepted standard of care. Deviation without documented justification is difficult to defend in professional clinical audits.

MSQH Service Standard 18 — Backbone of Pharmacy Services

"Everything we do to manage chronic patients is guided and measured by MSQH Standard 18."

Standard 18 Section Framework

- **18.1** Organisation and Management (PTC, Formularies)
- **18.2** Human Resource Development & Management (CE, Orientation)
- **18.3** Policies and Procedures (GDP, Med Error SOP, ADRs)
- **18.4** Facilities and Equipment (Cold Chain, Secure Storage)
- **18.5** Safety and Performance Improvement (Error Tracking)

Direct Chronic (NCD) Patient Supports

- **GDP (18.3.1.5):** Safe dispensing of long-term medications.
- **Counselling (18.3.1.6):** Active pharmacist patient education.
- **Clinical (18.1.1.8(b)):** Dosage/efficacy, TDM reviews, and MTAC.
- **Med Error (18.3.1.14):** RCA and CAP actions for high-alert drugs.
- **Specialised (18.1.1.8(d)):** Cytotoxic drug reconstitution, nuclear prep.

MSQH Standard 18 — Key Criteria with Direct NCD Impact

Clinical (18.1.1.8(b))

- **Quality Use:** Pharmacist reviews dosage, indications, interactions.
- **Pharmacokinetics:** Monitoring narrow therapeutic index drugs (warfarin, digoxin).
- **Counselling:** Storage, compliance, ADR guidance.
- *Compliance evidence:* Animal-origin lists, consent forms, counsel logs.

PTC & Errors (18.1.1.11 / 18.3.1.14)

- **PTC Roles:** Establishes hospital formularies, removes low-efficacy NCD drugs, updates treatment guidelines.
- **Error SOPs:** Mandates systematic reporting, Root Cause Analysis (RCA), and local MERS data export.

Indicators (18.5.1.4)

Track at least two:

- Prescription error rate (polypharmacy).
- Dispensing error rate (critical for insulin/chemo).
- Average dispensing wait times.
- Percentage/value of expired drugs.

MSQH Standard 18 — Integration with Other Standards

Related MSQH Standard	Connection to Pharmacy Services	NCD Application
Standard 5 — Infection Control	Criterion 5.3.1.1 — Antimicrobial Stewardship (AMS) policy, restricted drug controls.	Pharmacist-led AMS reviews for immunocompromised NCD patients.
Standard 9F — Day Care Services	Criterion 9F.6.3.3 — Chemo prep requirements and day care pharmacy reconstitution.	Safe, clean, timely on-site chemotherapy for day-care cancer patients.
Standard 12B — Outpatient Services	Criterion 12B.3.5 — Outpatient clinics ordering and dispensing procedures.	Smooth coordination of chronic medication refills.
Standard 14 — Critical Care	Criterion 14.6.12.6 — Specialized handling of cytotoxic drugs, radiopharmaceuticals.	Critically ill NCD patients receiving chemotherapy or diagnostic tracer drugs in ICU.
Standard 15 — Pathology Services	Criterion 15.1.1.7 — Pathology collaboration on drug monitoring.	Therapeutic Drug Monitoring (TDM) for narrow therapeutic index drugs.

Two Proven Malaysian Innovations — Ready for You to Adapt

V-MAC

Virtual Medication Adherence Clinic

- Pharmacist-led clinical phone or video patient follow-up sessions.
- Saves patient travel times, reduced overall clinic visits by 40%.
- **How to start tomorrow:** Set up a basic spreadsheet, dedicate a phone, use WhatsApp, enroll first 20 stable patients.

UMP

Ubat Melalui Pos — Medication by Post

- Direct courier delivery of medications straight to patient homes.
- More than 100,000 active chronic patients successfully enrolled.
- **How to start tomorrow:** Secure partnership with a local courier or Gojek/Grab, establish a dispatch logbook.

The Governing Operational Principle: "Decouple the patient from the pill."

Telehealth for NCDs: What Works, What Doesn't

What We Learned

- **High Engagement:** Rural patients exhibit strong clinical follow-up compliance to avoid travel times.
- **Convenience:** Better overall coordination, highly efficient.
- **What didn't work:** Poor internet connectivity, elderly with hearing difficulties, and clinically unstable patients.
- **Standard:** First intake visit MUST always be in-person.

Clinical Decision Guide

- **Stable NCD, good baseline compliance:** ✅ Approved for V-MAC.
- **Newly diagnosed NCD patients:** ❌ No (requires initial in-person counseling first).
- **Poor control (e.g. HbA1c >9%):** ❌ No (requires physical clinical checks).
- **Rural patients, long travel distance:** ✅ Approved for remote support.

The Bottom Line: “Telehealth is a tool for stable patients, follow-ups, and medication counselling. Use it wisely.”

The Strategic Vision: "Pharmacy Hub-and-Spoke" Model

Architecture Flow

The Hub: PHIS operates as the central repository for medication histories, clinical alerts, and dispensing logic.

The Spokes: Decentralized HIS, laboratory diagnostic databases, and clinical billing feeds interface straight into the core hub.

Primary Objective

Establish uni-directional interfaces (patient metrics, laboratory data, prescription requests, billing status) into the PHIS to enable real-time safety and dispensing checks.

Goal: One accurate patient record across all endpoints.

Your Action Plan – A "Menu of What to Steal" from Malaysia

#	Idea	What It Is	How to Start Tomorrow
1	**MTAC**	Medication Therapy Adherence Clinic – structured pharmacist-led followup for stable NCD patients.	Start with one NCD (e.g., diabetes), one pharmacist, and adapt Malaysia's MTAC Guideline and diabetes CPG as your clinical reference.
2	**V-MAC + UMP**	Virtual Medication Adherence Clinic + Medication by Post.	Decouple patient from pill – utilize standard spreadsheet, WhatsApp, and local courier networks (Gojek, Grab, etc.) for deliveries.
3	**Truth-Teller**	Governance model for managing disconnected HIS and PHIS systems.	Define one system as the absolute source of truth per function; document double-check SOP for critical clinical metrics.
4	**Formulary Champion**	Pharmacist-led formulary management and generic promotion.	Use local prescribing transaction logs to drive generic adherence, substitution, and therapeutic formulary compliance.
5	**Legal Framework**	Poisons Act, Dangerous Drugs Act, Act 586, Medicines Act, Sale of Drugs Act.	Review your local regulations. Do they protect chronic patients? Use Malaysia's legislative framework as a benchmark.
6	**Procurement Champion**	Pharmacist-led value assessment, centralised procurement, and PAP management.	Review top 10 costly NCD medications. Assess: Can we negotiate aggregate pricing? Are generic equivalents possible? Are buy-one-free-one or PAPs available?

The One Principle (unchanged): "Decouple the patient from the pill."

Questions for Your Own Context

- **Regulations:** Does your country have similar legal requirements for private hospital pharmacies? Are they actively enforced? Do you have professional guidelines and CPGs that complement the legislation?
- **Clinical Services:** Do you have MTAC-like structured adherence clinics? If not, could you start one?
- **Medication Safety:** Do you have a Medication Error Committee? Is there a "just culture" for reporting near misses?

- **Antimicrobial Stewardship:** Is there a pharmacist-led AMS program? Do you review antibiotics daily?
- **Generic Drugs:** Is generic prescribing the default? Are patients educated about generic safety and efficacy?
- **Digital Systems:** Do your HIS and pharmacy systems talk to each other? If not, what is your "swivel-chair" SOP?
- **CPGs & Standards:** Do you have national CPGs for diabetes, hypertension, and other NCDs? Do pharmacists use them to guide clinical decisions? Do you have professional guidelines for dispensing, MTAC, high-alert medications, and medication error reporting?

Let Us Build the Future Together

CONCLUSION

Core Philosophy

"The future of pharmaceutical care in Southeast Asia will not be built in isolation. It will be forged through peer-to-peer learning between pharmacists like us, who face the same daily battle against Non-Communicable Diseases (NCDs)."

Connect & Collaborate

Feel free to reach out for resources, templates, or to discuss collaborative safety initiatives.

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