How Closed Loop Medicines Management works in Hospitals

From admission to discharge: how staff, technology, and standards work together to keep patients safe.

Important Note
This is a high-level, ideal-path overview of CLMM.
It doesn't show hospital-specific workflows or exceptions.

NHS England
Digital Medicines

STAGE

HOSPITAL ADMISSION AND INITIAL MEDICATION HISTORY → INITIAL ASSESSMENT AND PRESCRIBING → MEDICINES RETRIEVAL → MEDICINES DISPENSING AND STORAGE → MEDICINES ADMINISTRATION → ADMINISTRATION RECORDING AND MONITORING → HOSPITAL DISCHARGE

PATIENT ACTIONS

Hospital admission and initial medication history

START

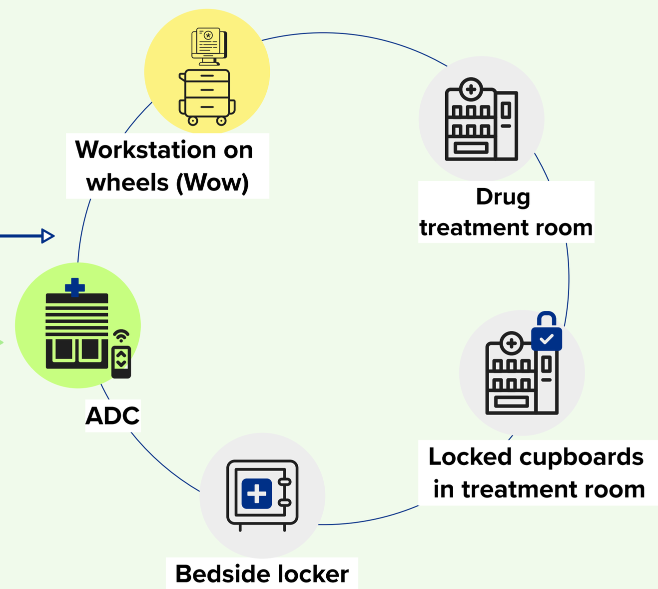
Patient arrives at the hospital, receives and wears a wristband with a unique barcode (patient's unique identifier).

Initial assessment and prescribing

Patient discusses symptoms, medicines, and allergy changes with clinician.

Medicines dispensing and storage

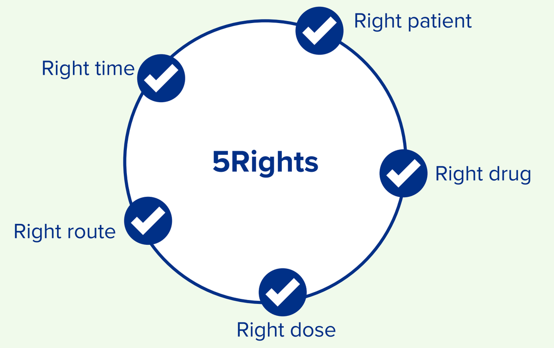
WARD'S MEDICINES SOURCES



Medicines administration

CLOSED LOOP MEDICINES ADMINITRATION

Patient confirms ID, receives meds, and reports side effects if any.



Administration recording and monitoring

Patient shares any side effects or reactions.

Hospital discharge

END

Patient or carer confirms readiness, understands instructions, and receives discharge medicines and summary.

FRONTLINE ACTIONS by CLINICIANS AND ADMIN STAFF

Hospital admission and initial medication history

Hospital staff escorts patient to ward, checks admission details, health history, and complete **first medicines reconciliation .**

Initial assessment and prescribing

Clinician assesses the patient, prescribes medicines, and records the management plan.

Pharmacist (if needed) reviews medicines, updates records, and advises on changes.

Medicines retrieval

Nurse reviews prescription and stock, then submits request if needed.

Prescription prompts automatic pharmacy request on low ADC stock.

Pharmacist verifies ePMA orders and sends them to the dispensary team for processing.

Medicines dispensing and storage

Nurse stores medications in appropriate locations.

Medicines administration

Nurse uses barcode checks to confirm patient and medication, then administers.

Nurse checks ePMA/EPR to ensure correct meds and availability before round .

Administration recording and monitoring

Clinicians monitor for medication compliance and side effects.

Clinicians review patient progress and adjust medications as needed. (New meds; stop meds; change in meds).

Hospital discharge

Nurse scans wristband and gives medication and discharge papers to patient or/and carer.

Clinicians prepare and validate the discharge summary, including meds details.

BACKSTAGE ACTIONS by PHARMACY TEAM

Initial assessment and prescribing

(Optional) Nurse/Pharmacist checks and documents Patient own drugs (PODs); Pharmacy relabels and prepares them for ward use or ADC storage.

Medicines retrieval

MEDICINES SUPPLY

Dispensing team places orders with the wholesaler via the stock control system.

Pharmacy receives automated low stock alerts from the ADC.

Wholesaler delivery

Pharmacy reconciles deliveries and updates inventory records.

Store team distributes medicines to wards, robots, or controlled drug areas.

Medicines dispensing and storage

MEDICINES PROCESSING & DISPENSING

Medicines are delivered to the ward by tube/porter/staff and scanned if required.

Medicines are prepared and quality-checked before being sent out.

Pharmacy robots dispense most prescriptions; liquids, IVs, and CDs are retrieved manually.

Hospital discharge

Pharmacist checks discharge meds; pharmacy prepares, labels, and delivers to ward.

Ward staff updates records and sends discharge summary to GP for follow-up.

KEY TECHNOLOGY and EVENTS

WITHOUT ADC

- **Barcode System:** Generates and prints the **barcode wristband,** linked to the EPR for accurate patient identification.
- **ePMA: Interfaces with EPR** to log prescriptions with accurate patient information.
- **Pharmacy dispensary robot:** Dispenses medications and integrates with the stock management system.
- **Barcode generation and labelling system:** Generates barcodes with patient and medication details.
- **Barcode Scanner:** Ensures accurate medication matching.
- **ePMA/EPR** flags mismatches in real-time and tracks them.

WITH ADC

- **Automated drug cabinets (ADC):** Receives patient medication data from the EPR.
- **Automated drug allocation:** Seamlessly updates pharmacy stock and ADC availability when levels are low.
- **Automated drug cabinets (ADC):** Triggers the automatic restocking of medicines to pharmacy team when stock is low.
- **ADC:** Logs medication retrieval and administration in real-time.
- **Coded access control** for controlled substances.

Administration recording and monitoring

- **Clinical Decision Support Systems (CDSS):** Provides clinicians with evidence-based recommendations.
- **ePMA/EPR:** Records new prescriptions or changes in medications.
- **Digital alerts:** Notifies staff of discrepancies or potential medication errors.

Hospital discharge

- **ePMA/EPR:** Records discharge prescriptions and updates patient records.
- **Discharge letter / summary:** Consolidates discharge-related medication information and populates the discharge letter and it is sent to the GP through MESH.

REQUIRED STANDARDS

GS1 UK Standards
- GTIN: Global Trade Item Number, used for identifying trade items.
- GLN: Global Location Number, used for identifying locations within a supply chain.
- GSRN: Global Service Relation Number, used for patient and staff identification.

NHSE Medicines related Standards
- DAPB4013: Medicine and Allergy/Intolerance Data Transfer
- SCCI0052: Dictionary of medicines and devices (dm+d)

NHSE Standards
- DAPB0108: Automatic Identification and Data Capture (AIDC)
- DCB1077: AIDC for patient identification
- DCB0160: Clinical Risk Management: its Application in the Deployment and Use of Health IT Systems