Use of Quick Response (QR) Barcode Integrated to Hospital Drugs Formulary to Help Patients in Preventing Medication Error at Home

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Promoting Patient Engagement towards Patient Safety.

Introduction

Medication errors that happen at home dominated by taking wrong dose or quantity of the medicines, skipping the schedule, or taking wrong medicine for wrong treatment purpose (1).

There are several reasons for medication errors at home such as inadequate information for the use during dispensing procedures, patient/ homecare provider got confused with measurement units and dosing tools, improper handover in-between caregivers, lack of health literacy as well as possible language barrier (2).

Several strategies introduced by experts to prevent medication errors at home (1,2). However, no practical solutions offered to engage patients/ caregivers in preventing medication errors at home.

This poster suggesting the use of Quick Response (QR) barcode system that integrated with specific section of Hospital Drugs Formulary that give full information for the patients.

Suggestions

Barcode system has been widely utilized for supply-chain processes. It also has been adopted in healthcare to prevent medical errors. The use of barcode in pharmaceutical activities at hospital can cover the safety all steps from transcription, dispensing and administration (3). Drug formulary developed as reference for medical staff for medicines that available in the inventory. It is highly suggested that every hospital must have its own drug formulary according to the medicines available (generic & patent name), including the full information of those medicines (4). However, no literature that discuss the use of barcode system, integrated with specific prescribed medicine information, as act of prevention for medication errors at home. **Picture 1** shows the sample of how the integrated QR barcode system may work.

Facilitators

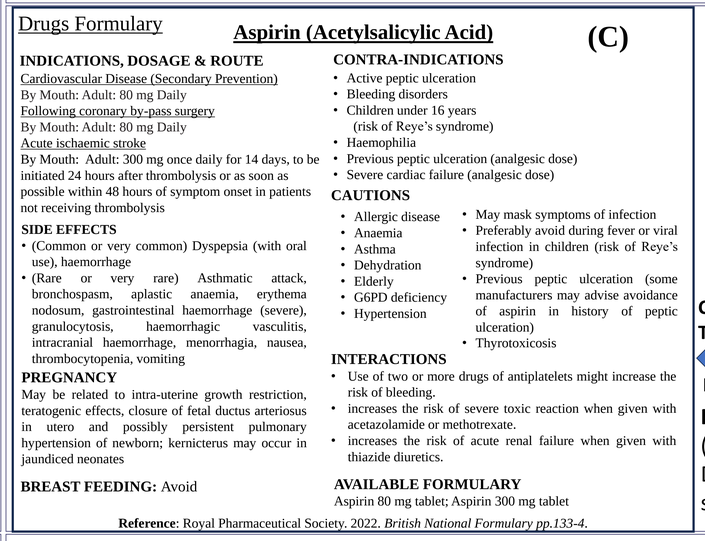
Several facilitating activities are suggested for implementation of this project:

- Medical committee must facilitate routine discussion between pharmacist and treating physicians to ensure the drugs formulary is updated and the use of medicines are according to the current treatment plans.
- IT staff help medical and pharmacy staff understand the QR barcode system.
- Pharmacy staff who dispensing the medicine should explain to patient/family/caregiver about the use the QR barcode for finding information about the medicine.

Conclusion

Barcode system, including QR barcode, has been widely used in supply-chains and conceived that it can be implemented in healthcare to prevent medical errors. Moreover, the use of barcode system has been practiced in pharmaceutical activities for dispensing medicine as well as preventing administration errors.

Internal hospital drug formulary evidently helpful in helping medical staff for treating the patient. We suggest that the drug formulary can be integrated with instruction label that sticked in patient's medicine using QR barcode. It helps patients to remember the instructions as well as understand the full details about their medicines.



Drugs Formulary

Aspirin (Acetylsalicylic Acid) **(C)**

INDICATIONS, DOSAGE & ROUTE

Cardiovascular Disease (Secondary Prevention)
By Mouth: Adult: 80 mg Daily
Following coronary by-pass surgery
By Mouth: Adult: 80 mg Daily
Acute ischaemic stroke
By Mouth: Adult: 300 mg once daily for 14 days, to be initiated 24 hours after thrombolysis or as soon as possible within 48 hours of symptom onset in patients not receiving thrombolysis

SIDE EFFECTS

- (Common or very common) Dyspepsia (with oral use), haemorrhage
- (Rare or very rare) Asthmatic attack, bronchospasm, aplastic anaemia, erythema nodosum, gastrointestinal haemorrhage (severe), granulocytosis, haemorrhagic vasculitis, intracranial haemorrhage, menorrhagia, nausea, thrombocytopenia, vomiting

PREGNANCY

May be related to intra-uterine growth restriction, teratogenic effects, closure of fetal ductus arteriosus in utero and possibly persistent pulmonary hypertension of newborn; kernicterus may occur in jaundiced neonates

BREAST FEEDING: Avoid

CONTRA-INDICATIONS

- Active peptic ulceration
- Bleeding disorders
- Children under 16 years (risk of Reye's syndrome)
- Haemophilia
- Previous peptic ulceration (analgesic dose)
- Severe cardiac failure (analgesic dose)

CAUTIONS

- Allergic disease
- Anaemia
- Asthma
- Dehydration
- Elderly
- G6PD deficiency
- Hypertension
- May mask symptoms of infection
- Preferably avoid during fever or viral infection in children (risk of Reye's syndrome)
- Previous peptic ulceration (some manufacturers may advise avoidance of aspirin in history of peptic ulceration)
- Thyrotoxicosis

INTERACTIONS

- Use of two or more drugs of antiplatelets might increase the risk of bleeding.
- increases the risk of severe toxic reaction when given with acetazolamide or methotrexate.
- increases the risk of acute renal failure when given with thiazide diuretics.

AVAILABLE FORMULARY

Aspirin 80 mg tablet; Aspirin 300 mg tablet

Reference: Royal Pharmaceutical Society. 2022. *British National Formulary pp.133-4.*

(B) Prescribed Drug Information

Date: 21 / 09 / 2023

Patient ID

Patient Name	: Mr. X
National ID No	: 0123456789
Medical Record No.	: BA-0123987

Drug Descriptions

Drug Name	: Aspirin Tab 80 mg
Drug Marking	: White tablet in Yellow package cover
Quantity	: Three package of 10 tablets each
Expiry Date	: 22 / 06 / 2024
Manufactured By	: XYZ Pharma
Manufacture Date	: 22 / 06 / 2022

Instructions:

- One time daily taken by mouth (oral) after meal.
- Return to treating physician 3 days prior to last tablet.
- **Not for general use**. Consult to cardiologist before using this drug.

Diagnosis: Post coronary bypass surgery

Prescribed By	: Dr. Lucky MD
Dispensed By	: S. Lucky B.
Location	: Outpatient Pharmacy
Dispense Date & Time	: 21 / 09 / 2023 (11.32 a.m.)

Click/Tap here for more information in Drugs Formulary

Click/ Tap Link

(A)

Hospital Pharmacy

SCAN FOR MORE INFORMATION

Date	: 21 / 09 / 2023
Patient Name	: Mr. X
National ID No	: 0123456789
Medical Record No.	: BA-0123987
Drug Name	: Aspirin tab 80 mg
Instruction	:

One time daily taken by mouth (oral) after meal

Scan QR code

Picture 1. Sample of Barcode Integrated to Hospital Drug Formulary System. (A) Label in Drug Cover; (B) Barcode link destination to Specific "Prescribed Drug Information", (C) Barcode link destination to "Drug Formulary" Page specific for the drug

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Barriers

- Hospital Information and Technology (IT) system is not ready to develop this integrated QR barcode system.
- Unavailable appropriate monitoring system for addition and deletion of medicines in drugs formulary.
- Information in drugs formulary not updated or the information not adapted to the use of medicines (treatment plans) within the hospital.
- Unsynchronized treatment plan with information in drugs formulary.

Possible Outcomes

- Patients reminded and aware for the administration instruction of their medicine.
- Patients aware of some condition which they unable to take the medicine and possible drug-drug and drug-food interactions.
- Patients understand the symptoms currently experienced maybe caused by side-effect or pharmaceutical reactions of their medicine.

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