Patient-Safety Improving Medication Information System for Care Workers in Taiwan

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Introduction

- Medication errors
  - Most important kind of medical errors [1]
  - Killed 4’000 patients per year [2]
  - 42% of medication errors → anthropogenic source (USA) [3]
  - 16% nurses had given wrong drug to wrong patients (Japan)
- CPOE → Medication errors caused by physicians and pharmacists

Medication Errors Caused by Care Workers in Taiwan

Introduction (cont.)

- To reduce medication errors caused by care workers in Taiwan:

1. A computerized Drug Deliver Cart
   - ✓ With Bar Code & RFID devices
2. Drug Information System including Drug Image
   - ✓ Help nurses checking such as adverse drug events, educating patients right usage, etc.
3. Intravenous Drug Incompatibility System
   - ✓ To check if it’s proper to mix different intravenous medicines

Language Problem

- Nurses in Taiwan:

English Information:
Have difficulty to read and comprehend

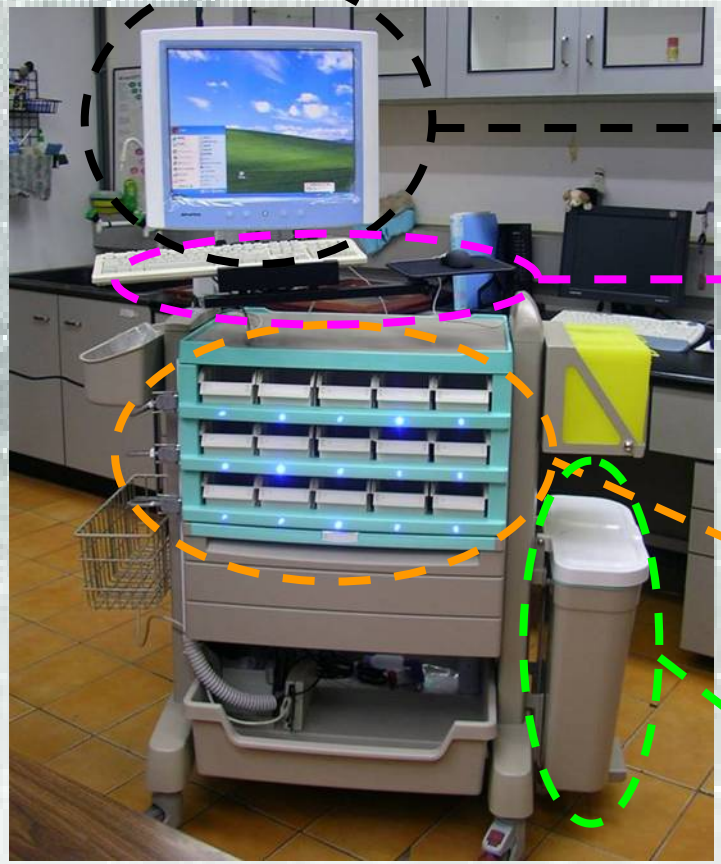
Chinese Information:
Easier and more friendly to use

Use Graph instead of script
Ex. Drug image

Language Translation:
Cooperate with MIMS poc
(Up-to-date Drug Information)

CMP
United Business Media

Result - Drug Deliver Cart with RFID and Barcode Devices



Touch Screen:
Instead of keyboard to increase usability

RFID & Bar Code devices:
Help nurses identifying patients and medications

Drug Drawers:
With patients' medication dispensed by pharmacists

Trash Can

Results – Drug Information System

Brand name &generic name:
Basic Drug information

Indications:
To show if the drug fits to the patient's diagnose

Usage:
To show if there is any special using way of this medicine.

Package:
To show the package and form of the drug.

Contraindication:
To show some diseases or other special conditions that are contraindicated to the drug

Precaution:
To show that some patients with these special conditions should be closely monitored or consider withdraw this drug

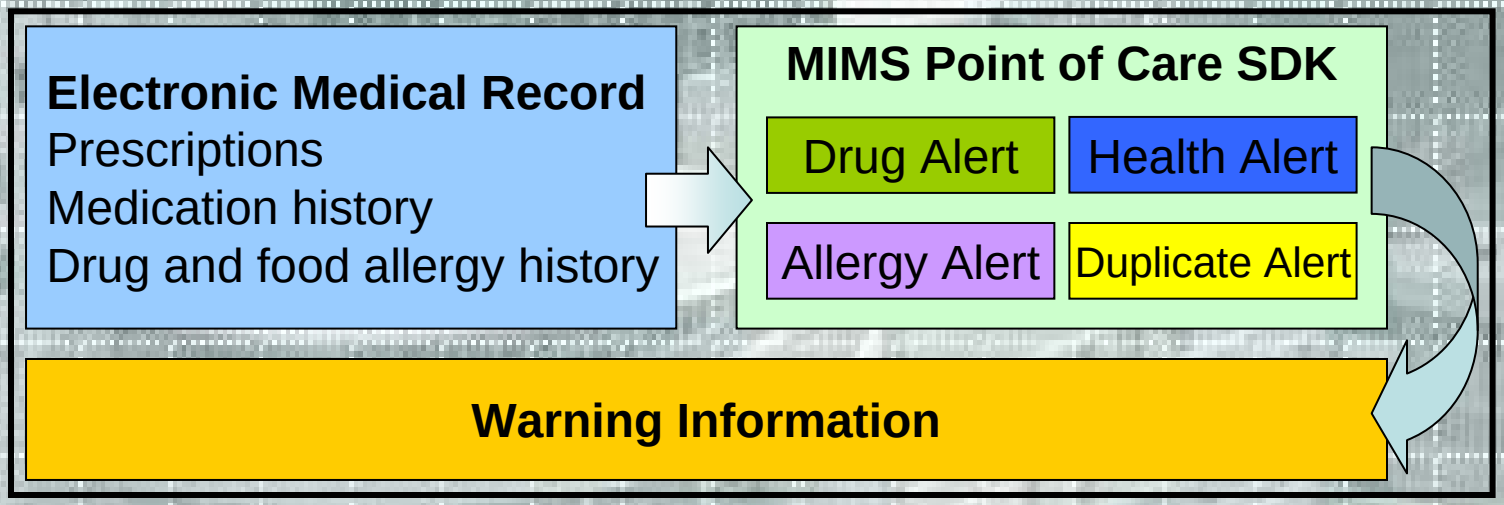
Side effects:
To show some side effects that patient would complained, nurses would note them and inform pharmacists and doctors

Drug interactions:
To show which drugs are forbidden to use with this medicine.

	藥物資訊
分類	處方藥
成分	Cetirizine diHCl
適應症	季節性鼻炎、結合膜炎、過敏性鼻炎、蕁麻疹、過敏性搔癢等過敏現象。
用法劑量	**成人及6歲以上孩童**：每次10毫克（即2匙），一天一次，於晚餐時與液體伴服。**3-6歲孩童**：一天一次，每次5毫克（即1匙），於晚餐時服用。或分別於早，晚各服用2.5毫克（即半匙）。**腎功能不全的患者**：劑量應減半。
包裝	口服溶液劑 1 mg/mL x 1 mL (NHI1.42), 30 mL (NHI47.60), 60 mL (NHI95), 120 mL (NHI171).
使用禁忌	對本藥中任何成分有過敏者。
注意事項	孕婦應避免使用本藥。Cetirizine 會被排泄至乳汁中，因此授乳婦不可使用本藥。從事駕駛及操作機械者，請小心使用，儘量不要過量服用。
副作用	有報導顯示會發生輕微、短暫的主觀性副作用，例如：頭痛、眩暈、嗜眠、精神激昂、口乾、胃腸不適。由精神運動性（psychomotor）的客觀性功能試驗結果來看，cetirizine 的鎮靜作用發生率與安慰劑的效果相當。Cetirizine 的過敏性徵狀極少被報導。
藥物交互作用	至今尚未有藥物交互作用方面的報告，但若同時服用鎮靜劑者，請謹慎使用。本藥應避免與過量的酒精併服。
藥物實體外觀	

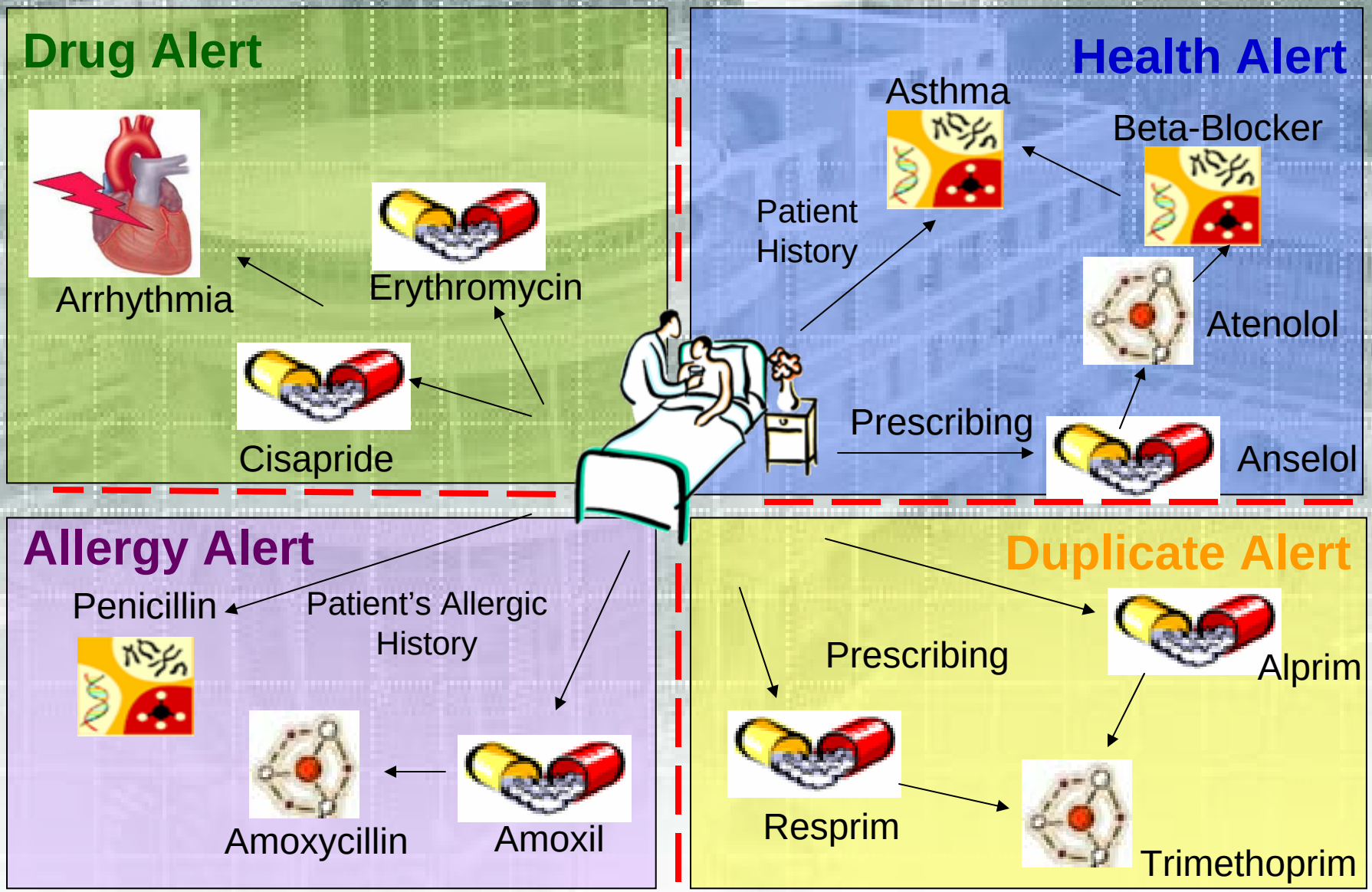
Drug Image:
Help recognizing the appearance of medicines

Drug Decision Support Module

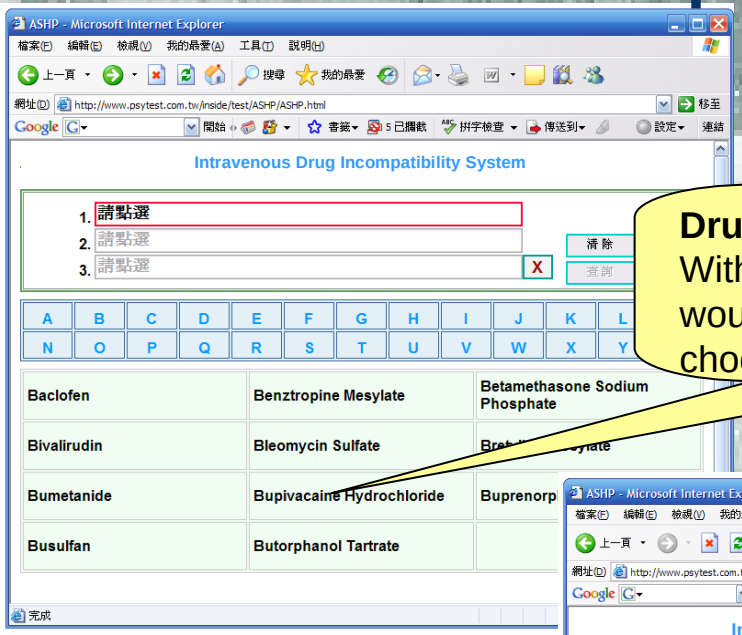


- ✓Drug Alert:
  - ✓ To find if any drug prescribed conflict with another
- ✓Health Alert:
  - ✓ To find if any disease is contraindicated with those drug prescribed
- ✓Allergy Alert:
  - ✓ To find drug allergic problems
- ✓Duplicate Alert:
  - ✓ Warn users when any medication is duplicate ordered

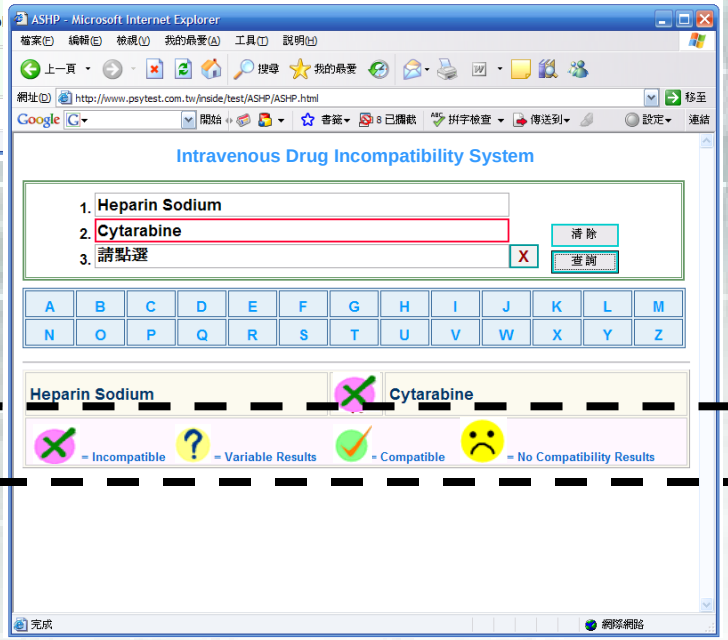
Drug Decision Support Module



Results - Intravenous Drug Incompatibility System



Drug list designed for touch panel: Without draw-down drug lists, it would be much easier for nurses to choose drug from touch panel.



Incompatible: Two drugs could not added together

Compatible: Two drugs could added together

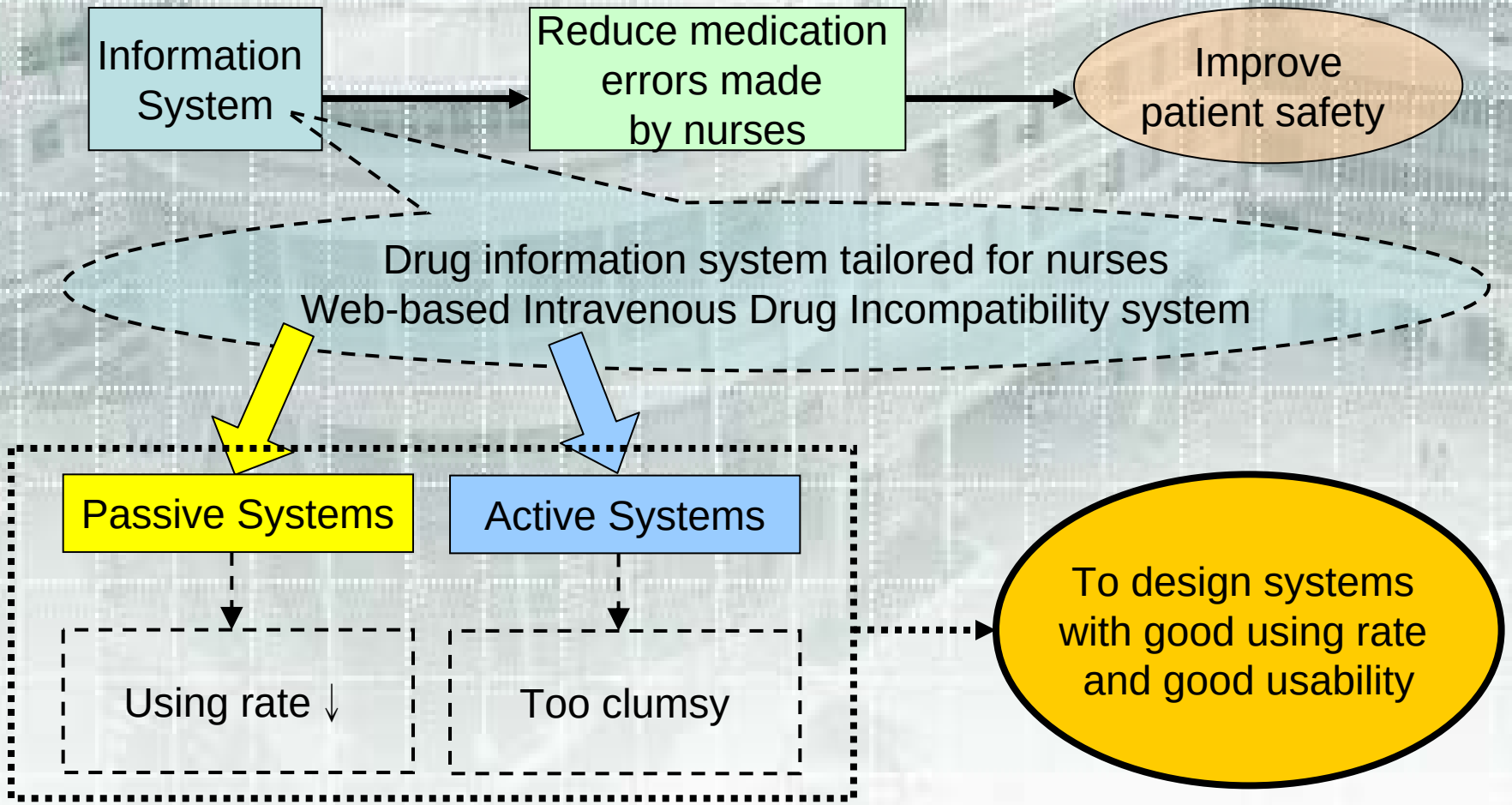
Variable results: Consult pharmacists to insure.

No results: No data available

Four kinds of results would show

Discussion

- The main purpose:



Conclusion

- Care workers in Taiwan
  - Medication administrators who play important roles in adverse drug reaction (ADR) reports where physicians and pharmacists would hardly to.
- Two of our systems:
  - The adequate and easy-to-get drug information system
    - ↑ Pharmaco-vigilance [11]
    - ↑ Patient safety
  - Intravenous drug incompatibility system
    - An easy way to check when dispensing intravenous drug mixture, and reduce avoidable errors
- Both of our systems exist as passive systems
  - Change to be more active, would the using rate raises or falls?
  - To know clearly from their work, and with our own experiences, then the design of assisting systems would be more acceptable.

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