

# Development of pharmacy CRRT solutions service at King Chulalongkorn Memorial Hospital, The Thai Red Cross Society.



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## Background

- CRRT solutions are defined as High Alert Medicine
- 8-10 AKI patients receive CCRT daily
- 250-300 liters of customized CRRT solution were prepared daily in the ICU wards
- Conventional compounding presents risks that may compromise the quality of care for ICU patients

## Objective

### Primary Objective

: To develop a pharmacy CRRT solution service

### Secondary Objectives

- : To evaluate the cost-effectiveness of pharmacy compounding compared to conventional compounding and commercial products
- : To evaluate service satisfaction



## Material and Method

### Nephrologists, Nurses, and Pharmacists meeting

- Consensus on premixed CRRT formula
- Clarified instructions for ordering, dispensing, and nurse preparation (adding potassium).

### Sterile pharmacy

- Established a master formula and a traceable batch compounding record.
- Develop a preliminary batch to assess potential risks and validate the compounding process.

### Pilot service

one ICU ward  
**Maximum capacity: 1 patient/day**

### Expand service

7 ICU wards  
**Maximum capacity: 5 patients/day**

### Redesign compounding process



### Steps for compounding a 1-liter bag:

- Draw 100 mL of 0.45% NaCl and discard it.
- Add 85 mL of 3% NaCl
- Add 25 mL of 7.5% NaHCO<sub>3</sub>

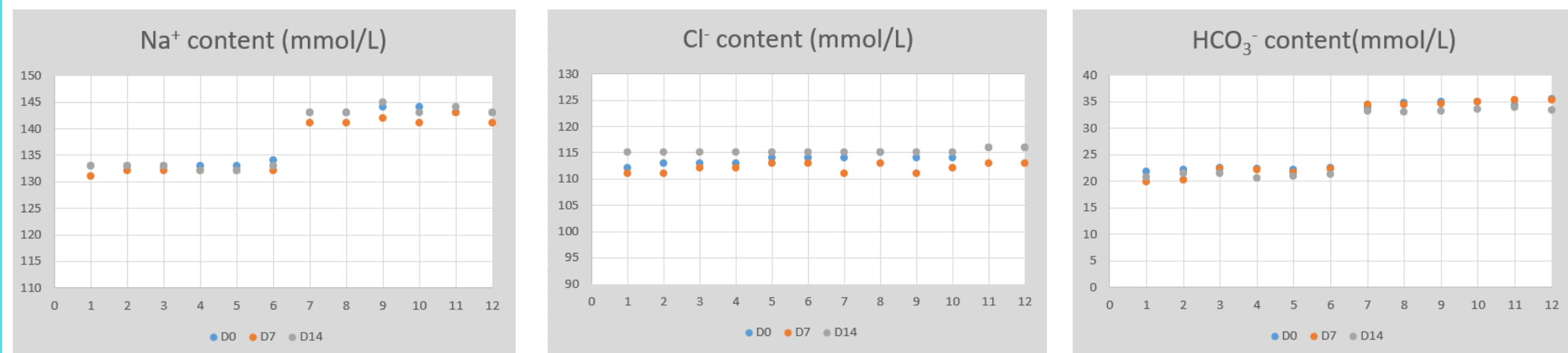
**All steps are prepared manually.**

### Steps for compounding a 1.2-liter bag:

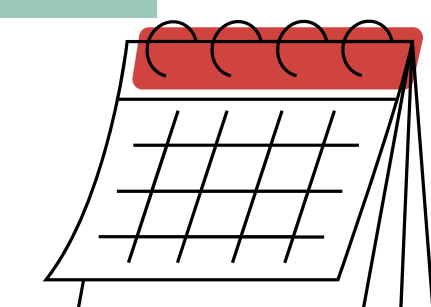
- Add 109 mL of 3% NaCl to a 0.4% NaCl bag.
- Add 61 mL of SWI
- Add 30 mL of 7.5% NaHCO<sub>3</sub>

**Steps 1 and 2 are done with a repeater pump, step 3 is done manually.**

### Electrolyte concentration analysis at D0, D7, and D14



Sample 1-3: Chulasol-22 at RT    Sample 4-6: Chulasol-22 at 2-8 C  
Sample 7-9: Chulasol-35 at RT    Sample 10-12: Chulasol-35 at 2-8 C



### Sterility test

- ✓ Day 0
- ✓ Day 7
- ✓ Day 14

## Results

2 premixed CRRT solutions

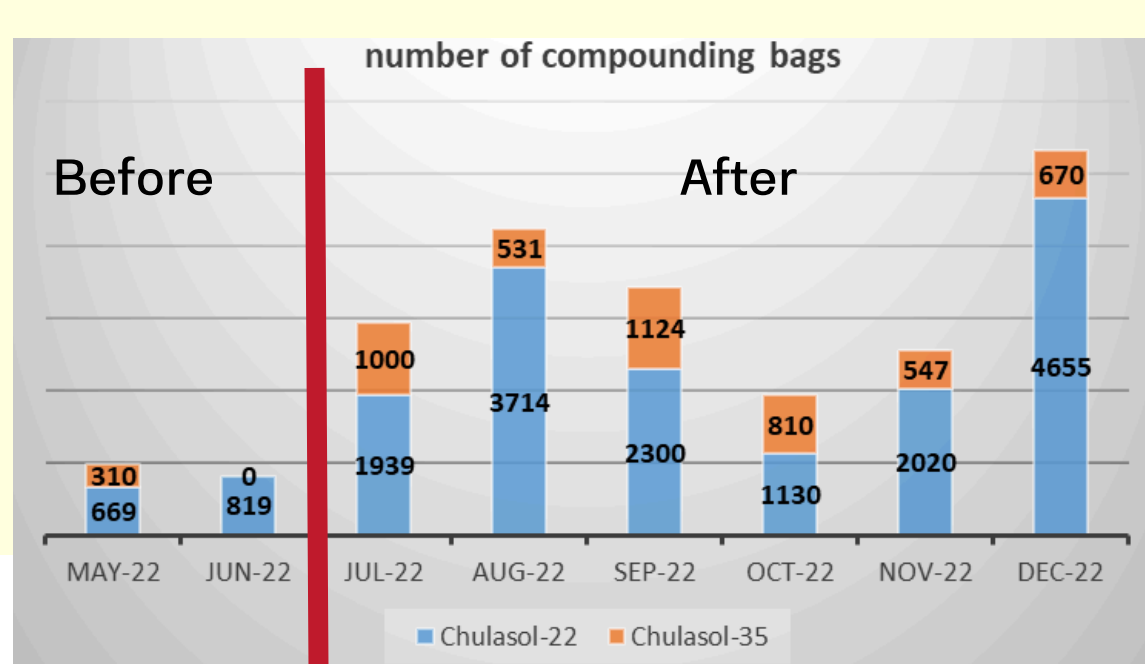
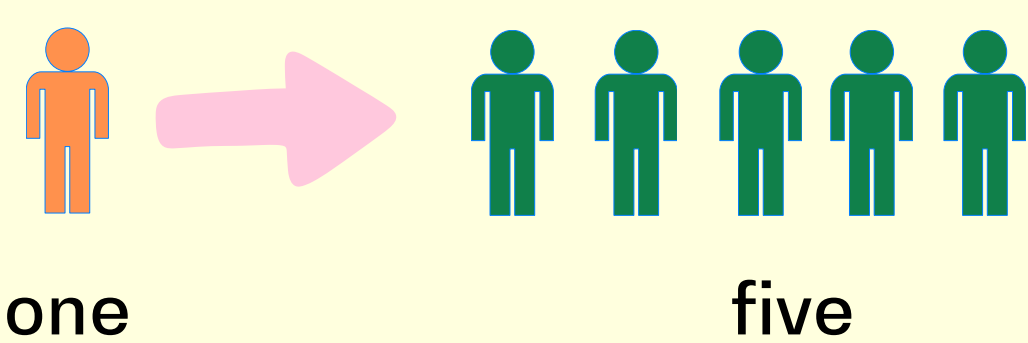


Chulasol-22  
Chulasol-35  
1.2 Litre

Beyond Use Date  
14 days at RT

### 1 Increase Service Capacity

maximum services/day



### 2 Cost reduction

#### 2.1 Conventional vs Pharmacy compounding (Per 1.2 liter)

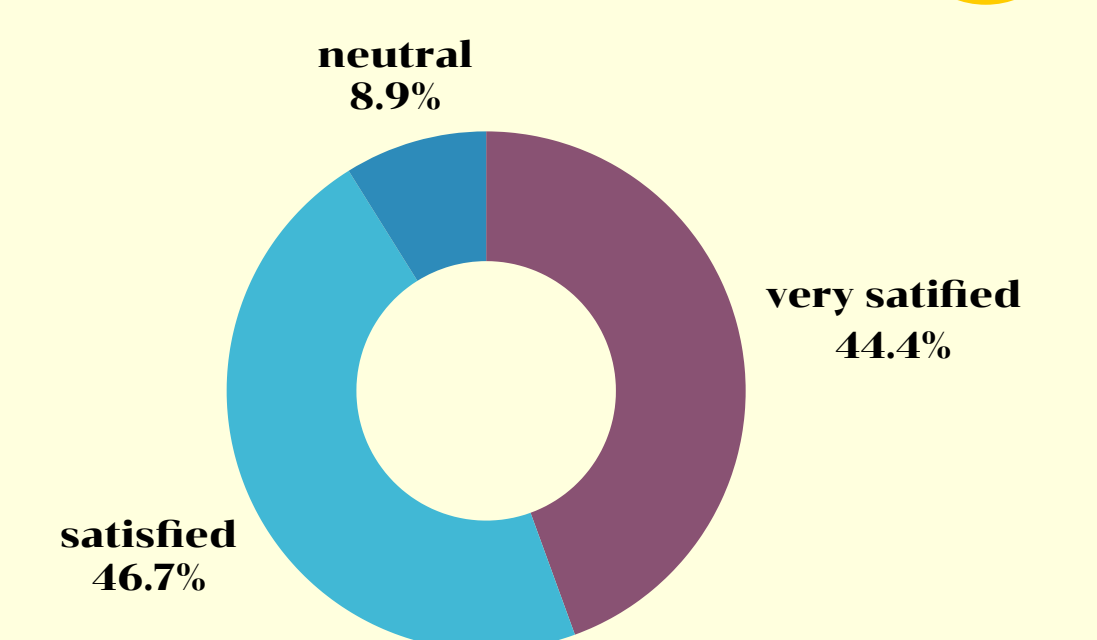
**4.86 \$** Conventional compounding      **3.43 \$** Pharmacy compounding

(cost of pharmacy compounding includes: materials, labor, equipment and maintenance cost)

#### 2.2 Commercial vs Pharmacy product (Per 1.2 liter)

**6.42 \$** Commercial product      **3.71 \$** Pharmacy compounding

### 3 Satisfaction



91% of ICU nurses reported satisfaction with the product quality and noted increased time available for patient care

## Conclusions

- An efficient and effective pharmacy CRRT solution service, accommodating up to five patients per day
- The cost of pharmacy compounding was lower than that of conventional methods and commercial products
- Most nurses were satisfied with the product quality, and multidisciplinary collaboration enhanced patient care

## Acknowledgement

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