

# PHARMACIST INTERVENTIONS IN NEONATAL INTENSIVE CARE UNIT AND ASSOCIATED COST AVOIDANCE AND COST SAVINGS

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## Background

- In neonates, frequent changes in dosing intervals and dosage can increase the risk of medication errors.
- In addition, patients in Neonatal Intensive Care Unit (NICU) are highly dependent on Total Parenteral Nutrition (TPN) which is one of the most important interventions made by pharmacists.
- Although the role of ICU pharmacists in improving clinical outcomes has been documented, there is little report on economic impact of such interventions in South Korea.

## Objectives

- **To analyze interventions made by a NICU pharmacist and describe economic impact by calculating cost avoidance and cost savings associated with accepted interventions.**

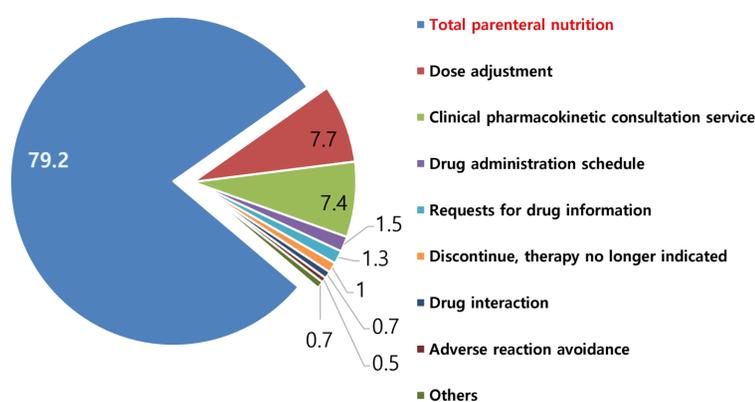
## Materials and Methods

- A retrospective evaluation was conducted by analyzing clinical intervention records from prescription review, TPN consults, and Clinical Pharmacokinetic Consultation Service (CPCS) reports delivered by pharmacist in a tertiary hospital for 6 months.
- Interventions were graded based on probable outcome severity by three independent pharmacist evaluators. This grade was used to calculate cost avoidance.
- Cost avoidance and cost saving from accepted clinical interventions were calculated to show economic impact of NICU pharmacist.

## Results

### 1. Classification of clinical interventions (N=608)

Types of clinical interventions	No. Interventions (%)
<b>Total parenteral nutrition</b>	<b>482 (79.2)</b>
Dose adjustment	47 (7.7)
Clinical pharmacokinetic consultation service	45 (7.4)
Drug administration schedule	9 (1.5)
Requests for drug information	8 (1.3)
Discontinue, therapy no longer indicated	6 (1.0)
Drug interaction	4 (0.7)
Adverse reaction avoidance	3(0.5)
Others	4 (0.7)
<b>Total</b>	<b>608 (100.0)</b>



### 2. Cost avoidance according to the level of outcome severity (N=608)

Severity	Probability of harm	Number (%)	Cost avoidance (won)
Catastrophic	1	0 (0)	0
Major	0.6	20 (3.3)	8,706,120
Moderate	0.4	573 (94.2)	166,286,892
Minor	0.1	12 (2.0)	870,612
Negligible	0	3 (0.5)	0
<b>Total</b>	-	<b>608 (100.0)</b>	<b>175,863,624 won (for 6 months)</b>

### 3. Cost savings of clinical interventions (N=10)

Types of clinical interventions	Number	Cost savings (won)
Change formulations of drug	3	33,271
Discontinue, therapy no longer indicated	2	16,401
Total parenteral nutrition	2	12,754
Dose adjustment	1	8,317
Elimination of therapeutic duplication	1	2,491
Requests for drug information	1	1,799
<b>Total</b>	<b>10</b>	<b>75,033 won (for 6 months)</b>

## Discussion

- The fact that parenteral nutrition support accounted for the greatest proportion of pharmacist's intervention activities in this study confirmed that low body weight and preterm infants are highly dependent on parenteral nutrition.
- The NICU pharmacist in our hospital monitors patient's condition everyday and provides daily consultation for parenteral nutritional support to the patient's condition changes.
- Cost savings were lower than other study in South Korea because of frequent recommendation for dose increasing due to weight gain in neonate.

## Conclusions

- **The most commonly performed clinical interventions by NICU pharmacists involved in total parenteral nutrition.**
- **This study showed the impact of a NICU pharmacist on medication safety and costs in a tertiary hospital.**
- **Further study is needed to demonstrate the clinical pharmacist's contribution to improvement of clinical and economic outcomes more comprehensively including development and subsequent validation of an economic model for the economic evaluation of NICU pharmacist.**

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### AUTHOR DISCLOSURES

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