

# Parenteral Nutrition Process Management for Newborn and Preterm Infants – A Preliminary Risk Analysis

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## Abstract

**Background:** There are variable practices in the management of the parenteral nutrition (PN) process in hospitals having a neonatal intensive care unit (NICU). In our hospital, PN is prepared partially on the neonatal ward by nurses but also at the central pharmacy by trained pharmacy technicians. A previous study showed a concentration non-conformity of 34% of on-ward PN preparations potentially resulting in under- or overfeeding of the patients.

**Objectives:** The objectives were to perform preliminary risk analyses (PRA) in preparation for our hospital's transition to universal central pharmacy PN compounding.

**Method:** A working group including pharmacists, neonatologists, nurses, and pharmacy technicians performed two PRA. The risks of 9 management steps of the PN process were identified, evaluated, and quoted. A comparison of the number of risks and their criticality index (CI) was conducted.

**Results:** A total of 36 and 39 risks were identified for PN preparation in the NICU and the pharmacy, respectively. For the NICU, ten risks (28%) had an “acceptable” CI, 15 risks (42%) were “under control” and eleven (31%) were defined as “non-acceptable”. For the pharmacy, 14 risks (36%) had an “acceptable” CI, 19 risks (49%) were “under control” and six (15%) were defined as “non-acceptable”. Risks directly related to the preparation process, including the steps preparation hood, PN preparation and analytical quality control, represented a cumulated CI of 145 for eleven NICU-risks vs 108 for twelve pharmacy risks (-26%). The implementation of immediate improvement measures, e.g. an electronic prescription form, reduces the total CI by 5.7% and 2.2% for the NICU and the pharmacy, respectively.

**Conclusion:** This PRA highlighted the safety differences between PN preparation in the NICU vs. the pharmacy at our institution, and facilitated our moving forward with a process change that should improve the care of our neonatal patients. Nevertheless, long-term improvement measures have to be implemented to further reduce risks related to the PN management process.

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