Our study estimated that the costs of PN therapy for pediatrics ranged from €28.86 to €640.41. The purpose of this study was to create a model to assess the total costs of PN therapy for neonates, infants and children using formulations manufactured in-hospital – either in a hospital pharmacy or in the ward.

### Material and Method (cont’d)

- **Face-to-face and telephone interviews of healthcare professionals (physicians, pharmacists and nurses) in 12 hospitals across 4 EU countries (Belgium, France, Germany, and UK) were conducted in 2010 to collect resource use, including ingredients, staff time, equipment, and supplies for the patient groups: newborns (pre- and term babies with different weight groups), infants (<2 years excluding newborns), and children (between 2 and 18 years). Additional information was collected via literature review.

- A cost model connecting resource use with publicly listed prices from government websites and published literature was constructed using Microsoft Excel to generate estimated total costs for a PN bag in each of the 4 mentioned countries.

- This model was piloted in 3 Belgian hospitals, which together treat a total of 763 patients annually (588 neonates and 175 infants) with 8,068 used bags (6,986 for neonates in the ICU, 509 for neonates on the ward, 502 for paediatrics in the ICU, 80 for paediatrics on the ward).

### Organization of the hospital production

- **93%** of the 8,068 pediatric PN bags in Belgium were compounded in the hospitals and **7%** were industrially manufactured.

- **80%** of the in-hospital compounded bags were produced in the pharmacy and **20%** on the ward.

### Cost analysis

- Fixed and variable costs were taken into account to determine the cost of producing an in-hospital formulation. Variable costs depend on the type of formulation and included the costs of the raw materials, ingredients or supply items. Fixed costs included bacteriology controls, depreciation of equipment and facilities.

### Costs per case

- The length of parenteral nutrition for neonates depends on their weight, and generally treatment becomes shorter with increasing birth weight. For preterm neonates <1000g, PN averaged 27 days. Neonates with a birth weight >2500g received PN for approximately 1 week. The average treatment duration across all neonates of differing weights was 12 days. Infants <2ys received PN for 4 days, children between 2 and 18yrs received PN for 9 days.

- **Total average treatment costs were €648.07 for neonates, €298.62 for infants <2yrs and €844.66 for children between 2 and 18yrs.**

### Results

**Sensitivity analyses**

- One-way sensitivity analyses were performed to test the impact of different levels of discount rates on the sensitivity analyses assumed to be 10, 15 and 20% of total nutrition component costs. The total costs per bag varied for neonates €52.19 (10%), €55.46 (15%) and €51.33 (20%); for the infants €71.45 (10%), €85.95 (15%) and €88.25 (20%) and for the children €88.73 (10%), €98.17 (15%) and €107.61 (20%).

- The range for variation “2 time measurement” was also derived from interviews, and represents the lowest and highest quoted minutes to prepare compounded PN (37 and 199 minutes). Costs per bag for infants when increasing personnel time ranged between €57.92 (neonates), €79.32 (infants) and €98.52 (children).

Lower personnel time: total costs per neonate bag €35.77, for infants €57.17 and for children €76.37.

### Conclusion & Discussions

- Our study estimated that the costs of PN therapy for pediatrics ranged from €53.25 to €93.85 in Belgian hospitals. The results are consistent with literature, which reported €51.78 ± 1.333 for individualized admixtures and €61.21± (± 6.55) for standard solutions in their studies.

- We found that a significant proportion of the total cost of PN was due to staff time. Depending on patient group, staff time accounts for 31% - 54% of total costs.

- Ready prepared PN could increase medical staff time for patient-related activities by reducing staff time spent on compounding.

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