

ECONOMIC BURDEN OF CLINICIAN-DRIVEN TESTS AND TREATMENTS IN VERY LOW BIRTH WEIGHT PRETERM INFANTS

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Background: There is increasing pressure to focus on improving value in healthcare, defined as health outcomes achieved per dollar spent. A lack of data exists regarding the economic burden of individual clinician-driven tests and treatments in neonatal care. Comparative data on the cost of neonatal treatments and tests would identify targets for comparative effectiveness research and value-focused quality improvement projects. Our objective was to estimate the total economic burden of clinician-driven tests and treatments for very low birth weight (VLBW) preterm infants.

Materials/Methods: Retrospective cohort study using the Pediatric Health Information System (PHIS) database, an inpatient billing database of Children's Hospitals within the United States. Costs were estimated from cost-to-charge ratios, regionally adjusted using the CMS wage/price index and adjusted for time to 2018 using the Producer Price Index for Inpatient Services. Laboratory, Pharmaceutical and Imaging billing codes were categorized into clinician-driven test and treatment variables (CTTs) and ranked by total cumulative cost across the entire cohort.

Results: 24,099 VLBW preterm infants from 51 hospitals, with 1,275,055 total patient days, were included in the cohort. Estimated total cost for birth hospitalization NICU care was \$4,154,568,786. Combined CTT costs contributed approximately 11% of total cost (\$450,047,764). The majority of CTT costs came from pharmaceuticals (60%, \$271,510,531), followed by laboratory tests (27%, \$119,284,492), and imaging tests (13%, \$59,252,741). Based on total cumulative costs, parenteral nutrition (\$85,951,706, 32% of pharmaceutical costs), blood gases (\$33,993,088, 29% of laboratory costs) and chest x-rays (\$18,452,556, 31% of imaging costs) were the most costly CTTs in their respective categories.

Conclusions: Within a large national cohort of VLBW preterm infants, total spending on clinician-driven tests and treatments (CTT) was estimated to be over 450 million dollars. The most costly CTTs were chest x-rays, blood gases, and parenteral nutrition, which all have high exposure and utilization rates. Thus, efforts to improve value in neonatal care may derive the greatest benefit by focusing on reducing utilization of these commonly used tests and treatments. Further study is needed to examine the relationship between CTT spending, patient variability, and key neonatal outcomes to identify high yield targets for value-driven comparative effectiveness research.