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Impact of High Flow Nasal Cannula on Resource Utilization in Bronchiolitis

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Impact of High Flow Nasal Cannula on Resource Utilization in Bronchiolitis

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X **Resident/Psychology Intern (≤ 1 month of dedicated research time)**

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Other authors/contributors involved in project: Troy Richardson, PhD; Jessica Markham, MD; Jeffrey Winer, MD

IRB Number: 16030246

Describe role of Submitting/Presenting Trainee in this project (limit 150 words): I wrote the bulk of the manuscript (introduction, results, discussion, conclusions) with guidance from Dr.'s Berg, Markham, Richardson, and Winer, and will be the first author. Dr.'s Markham and Richardson primarily authored the methods.

Background:
Bronchiolitis is one of the most common diseases requiring hospitalization in children 1-24 months of age, but presently treatment is primarily supportive. High flow nasal cannula is a newer method of oxygen delivery pediatric hospitals have been rapidly adopting to treat respiratory insufficiency caused by viral bronchiolitis.

Objectives/Goal:
We sought to compare resource utilization, including cost, length of stay (LOS), and readmission among children who were treated with HFNC versus those who were not.

Methods/Design:
In this cross-sectional, multicenter study, we obtained clinical and resource utilization data from the Pediatric Health Information System (PHIS) database for otherwise healthy children 1 to 24 months of age admitted for bronchiolitis. We assessed treatment with HFNC based on a combination of billing codes and reviewed 1,105 charts at two centers to determine the accuracy of these codes. We compared costs, LOS, and readmission rates between those who received HFNC and those who did not.

Results:
The PHIS database codes demonstrated sensitivity of 90.4% and specificity of 99.3% to detect encounters in which HFNC use was verified by chart review. Children treated with HFNC had longer LOS (44.5 vs. 31.2 hours; $p<0.001$), greater total costs ($5460 vs. $3540; $p<0.001$), and greater daily costs ($3,017 vs. $2,750; $p<0.001$). Those treated with HFNC were less likely to be readmitted by 3 and 7 days ($p<0.001$), but by 14 days readmission rates were similar in the two groups.

Conclusions:
Children with bronchiolitis treated with HFNC required more intense resource utilization (longer LOS and greater costs) compared to those not treated with HFNC. Cost remained greater after accounting for their increased LOS. Greater understanding of the criteria used to place children on HFNC is needed to better assess its value.