JOURNAL CLUB

Decreasing Hospital Length of Stay for Bronchiolitis by Using an Observation Unit and Home Oxygen Therapy

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Importance: Pediatric observation units (OUs) offer the opportunity to safely and efficiently care for common illnesses previously cared for in an inpatient setting. Home oxygen therapy (HOT) has been used to facilitate hospital discharge in patients with hypoxic bronchiolitis. It is unknown how implementation of a hospitalwide bronchiolitis treatment protocol promoting OU-HOT would affect hospital length of stay (LOS).

Objective: To test the hypothesis that using OU-HOT for bronchiolitis would decrease LOS.

Design and Setting: Retrospective cohort study at Primary Children's Medical Center, Salt Lake City, Utah.

Participants: Uncomplicated bronchiolitis patients younger than 2 years admitted during the winter seasons of 2005 through 2011.

Interventions: Implementation of a new bronchiolitis care process encouraging use of an OU-HOT protocol.

Main Outcome Measures: Mean hospital LOS, discharge within 24 hours, emergency department (ED) bronchiolitis admission rates and ED revisit/readmission rates, and inflation-adjusted cost.

Results: A total of 692 patients with bronchiolitis from the 2010-2011 bronchiolitis season were compared with 725 patients from the 2009-2010 season. Implementation of an OU-HOT protocol was associated with a 22.1% decrease in mean LOS (63.3 hours vs 49.3 hours, $P<.001$). Although LOS decreased during all 6 winter seasons, linear regression and linear quantile regression analyses for the 2005-2011 LOS data demonstrated a significant acceleration in the LOS decrease for the 2010-2011 season after implementation of the OU-HOT protocol. Discharges within 24 hours increased from 20.0% to 38.4% ($P<.001$), with no difference in ED bronchiolitis admission or ED revisit/readmission rates. After implementation of the OU-HOT protocol, the total cost per admitted case decreased by 25.4% ($4800 vs $3582, $P<.001$).

Conclusions and Relevance: Implementation of an OU-HOT protocol for patients with bronchiolitis safely reduces hospital LOS with significant cost savings. Although widespread implementation has the potential for dramatic cost savings nationally, further studies assessing overall health care use and cost, including the impact on families and outpatient practices, are needed.

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BRONCHIOLITIS IS THE MOST common cause of hospitalization in children younger than 1 year in the United States, accounting for almost 150 000 admissions per year and a mean hospital length of stay (LOS) of 3.3 days.[1-3] Inpatient management accounts for significant health care use even though care

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is primarily supportive and most interventions for uncomplicated disease do not significantly alter the disease course.[2,4,5] Findings from prior research demonstrate that the introduction of standardized bronchiolitis practice guidelines can reduce unnecessary interventions and shorten hospital LOS.[6-14]

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Hypoxia is a major component of clinical decision making regarding admission and discharge criteria in patients with bronchiolitis, and increasing reliance on pulse oximetry in emergency departments and inpatient settings may contribute to higher rates of admission and longer LOS for this disease.[3,15-22] Findings from

emerging research demonstrate that for a subset of hypoxic patients with bronchiolitis, home oxygen therapy (HOT) is a safe and acceptable method of avoiding hospitalization or reducing LOS for inpatients with bronchiolitis, and in certain regions of the country, HOT for uncomplicated bronchiolitis is routinely used.[21,23-26]

Due to a rising census, prolonged LOSs, and a growing impact on staffing and bed space during the bronchiolitis season, our hospital convened a Bronchiolitis Guidance Team composed of hospital physicians, nurses, respiratory therapists, discharge planners, and quality improvement personnel. This group implemented a hospitalwide bronchiolitis care process in 2005 with an option for HOT for hypoxic patients with bronchiolitis. Because most patients with bronchiolitis at Primary Children's Medical Center (PCMC) historically had hospital LOSs longer than 24 hours (mean 3 days) and findings from previous pediatric observation unit (OU) studies showed a high likelihood of unsuccessful discharge within 24 hours, patients with bronchiolitis were usually admitted to the inpatient unit (IU), as opposed to our 24-hour OU.[27,28] Even as HOT became more accepted and its use promoted to facilitate discharge, it was rarely used for patients discharged within 24 hours. A study from our institution during the 2007-2008 winter season evaluating the use of OU for the management of bronchiolitis demonstrated that hypoxia was a major barrier to discharge within 24 hours.[21]

Paradoxically, when the bronchiolitis care process was fully implemented in 2005, LOS increased. This was followed by modest decreases in LOS back to precare process LOS. With growing experience from Denver Children's Hospital, where an emergency department (ED)–based observation protocol using HOT decreased admission rates for patients with bronchiolitis, we focused our efforts on developing a similar protocol in our OU. For the 2010-2011 winter season, the care process was modified to encourage OU admission and rapid deployment of HOT for a larger subset of patients with bronchiolitis, as a means of facilitating safe, rapid discharge. We hypothesized that this OU-HOT protocol would significantly decrease the mean LOS for these patients in our hospital by increasing the proportion of patients with bronchiolitis discharged from the hospital within 24 hours.

METHODS

STUDY DESIGN AND METHODS

We conducted a retrospective quality improvement study comparing a cohort of patients with bronchiolitis admitted to PCMC during the 2009-2010 bronchiolitis seasons with the cohort during the 2010-2011 season (November 1st to April 30th), after implementing a new bronchiolitis care process using the OU-HOT protocol. The Privacy Board of PCMC and the University of Utah institutional review board approved the study.

STUDY SETTING

Primary Children's Medical Center is a 289-bed, urban tertiary care children's hospital, with approximately 45 000 ED patient visits and 13 000 patient admissions (OU and IU combined) per year. The OU, adjacent to the ED, has 18 beds and is staffed 24/7 by general pediatricians or pediatric emergency medicine physicians. Patients are admitted to the OU if LOS is expected to be shorter than 24 hours by the attending physician.

Inclusion Criteria: Patient
- Age 3-24 months; minimum of 48 weeks age corrected for prematurity
- Tolerating NC oxygen (ie, not requiring face mask or high-flow NC)
- Hypoxia, or concerns for impending/eventual need for O_2 supplementation
- Has bronchiolitis NOT complicated by SBI, such as UTI or bacterial pneumonia

Inclusion Criteria: Family
- Willing and able to manage home O_2
- Family has reliable transportation, psychosocial situation, and telephone number
- Family has a regular medical caregiver/PCP (responsible for weaning/stopping O_2)
- Can follow up in 24 hours after discharge with a medical provider
- Speaks English or Spanish
- Lives within 30 minutes of a health care facility

Exclusion Criteria
- Significant chronic medical conditions
- Previous episodes of wheezing or underlying diagnosis of asthma/RAD
- Observed or reliable history of apnea at home, outside health facility or ED

Discharge Criteria
- Minimum of 8 hours observation time
- Saturations of ≥88% on:
  - ≤0.5 L/min NC O_2 <12 mo old
  - ≤0.8 L/min NC O_2 ≥12-24 mo old
- Meeting maintenance fluid needs orally and able to maintain hydration without need for frequent deep suctioning
- No signs of deteriorating respiratory status
- Attending/caregiver comfortable with discharge home
- 24-Hour follow-up arranged

Figure 1. Inclusion and exclusion criteria and home discharge criteria for observation unit and home oxygen therapy protocol. ED indicates emergency department; NC, nasal cannula; PCP, primary care physician; RAD, reactive airway disease; and SBI, serious bacterial infection.

A bronchiolitis care process has guided the clinical care of bronchiolitis at PCMC since 2005. Case definition for the uncomplicated bronchiolitis cohort (low severity of illness without comorbid conditions younger than 2 years at admission) was based on a predetermined set of discharge codes and inclusion/exclusion criteria developed in 2005, and updated to reflect ongoing changes in *International Classification of Diseases, Ninth Revision* as approved by Centers for Medicare and Medicaid Services and the American Medical Association, to monitor all bronchiolitis admissions to our hospital (eAppendix; http://www.jamapeds.com). The cohort included patients admitted to both the IU and OU. Between 2005 and 2010, most patients were admitted to the IU. However, for the 2010-2011 bronchiolitis season, the care process was modified to more actively use the OU for admitted patients with bronchiolitis. A subset of patients presenting to the ED with bronchiolitis were started on the OU-HOT protocol for an 8-hour minimum observation period. The OU-HOT subset included patients who were both hypoxic and nonhypoxic on admission, since nonhypoxic patients with bronchiolitis often develop hypoxia during hospitalization, thus qualifying for HOT.

In the ED, all patients with clinical bronchiolitis had nasopharyngeal suctioning performed. Use of nebulizer therapies, intravenous fluids, and radiography were left to the discretion of the treating ED physician. If inclusion criteria were met (**Figure 1**), the ED physician admitted patients with bronchiolitis to the OU on the OU-HOT protocol under the care of the OU physician. Hypoxia in our facility is defined as oxygen saturations less than 88%. Patients with bronchiolitis admitted to the OU required a minimum of 8 hours of observation prior to discharge to ensure (1) no increase in supplemental oxygen if hypoxic, (2) no worsening respiratory distress by physical examination, (3) enough oral intake to maintain normal hydration as manifested by normal urine output, and (4) secretions managed with bulb suctioning. Patients who deteriorated in the OU were admitted to either the IU or if requiring high-flow nasal cannula, continuous positive airway pressure, or intuba-

tion, to the pediatric intensive care unit (PICU). Primary care physicians (PCP) were contacted to facilitate discharge planning and follow-up care, and all patients discharged from the OU receiving HOT had outpatient follow-up within 24 hours with their PCP or one of many respiratory care clinics established to provide outpatient follow-up assessments and care if the PCP was unavailable during a weekend or holiday.

MAIN OUTCOME MEASURES

The primary outcome measure was mean hospital LOS, comparing the 2009-2010 and the 2010-2011 bronchiolitis season cohorts. Secondary outcomes included discharge within 24 hours, ED bronchiolitis admission rates, ED revisit/readmission rates, and inflation-adjusted cost. We also included mean LOS and proportion of HOT discharges by unit (OU vs IU), comparing the 2009-2010 and 2010-2011 seasons. Safety was defined as no increase in ED revisit/readmission rates or PICU admissions, and no apnea or need for advanced airway management after discharge.

DATA ANALYSIS

The effect of the OU-HOT protocol was estimated in 2 ways: first, by comparing the LOS in 2010-2011 to the LOS in the immediately preceding winter season of 2009-2010, and second, by comparing the observed LOS in 2010-2011 to the expected LOS in 2010-2011 based on extending the linear trend in LOS over the preceding 5 winter seasons forward to 2010-2011. These analyses were implemented using ordinary least squares linear regression for comparisons of the mean LOS, and using linear quantile regression for comparisons of median LOS. For comparisons of 2010-2011 LOS to the projected LOS based on the prior trend, the regression models included a linear term for year and an indicator variable for the 2010-2011 season. The comparisons were performed first without covariate adjustment, and then after adjusting for sex, age, and payer type as covariates. A similar analysis, comparing observed with expected, was performed using logistic regression to relate the proportion discharged within 24 hours to year and an indicator variable for the 2010-2011 season, with and without adjustment for sex, age, and payer type. In addition, standard deviation calculations were made and statistical process control (SPC) charts were generated (Statit Custom QC) for overall ED bronchiolitis admission rates and cohort ED revisit/readmission rates, comparing these secondary outcomes over time.

COST ANALYSIS

Cost data were based on the Intermountain Healthcare activity-based cost accounting system and only includes changes in cost for the hospital, and does not include inpatient physician costs or outpatient clinic costs. For comparisons of 2010-2011 costs to the projected costs based on the prior trend, the regression models included a linear term for year and an indicator variable for the 2010-2011 season. Costs were adjusted for inflation to 2011 dollars.[29,30]

Table 1. Patient Demographics, Comparing 2009-2010 and 2010-2011 Seasons, Before and After Implementation of the Observation Unit and Home Oxygen Therapy Protocol

Patient Demographic	2009-10 Season (n = 725)	2010-11 Season (n = 692)
Male, No. %[a]	383 (52.8)	405 (58.5)
Age, mo		
Mean (SD)	7.5 (6.1)	7.1 (6.0)
Median (IQR)	6 (2-11)	6 (2-11)
Public- and self-insured, No. %[a]	405 (55.9)	444 (64.2)

Abbreviation: IQR, interquartile range.
[a] Sex and payer type differences were statistically significant ($P = .03$ and $P = .002$, respectively).

RESULTS

The 2009-2010 (n=725) and 2010-2011 cohort (n=692), before and after implementation of the OU-HOT protocol, differed significantly in the male to female ratio and proportion of publicly insured and self-pay patients (**Table 1**). Mean age was 7.5 months vs 7.1 months for the 2009-2010 and 2010-2011 cohort, respectively ($P<.03$). The mean LOS decreased from 63.3 hours to 49.3 hours ($P<.001$) (**Table 2**). Similar decreases were seen for median LOS values, both before and after covariate adjustment. The OU-HOT protocol also led to a significant increase in the proportion of patients discharged within 24 hours, from 20.0% during the 2009-2010 bronchiolitis season to 38.4% during the 2010-2011 bronchiolitis season ($P<.001$) (**Figure 2**).

Although the mean hospital LOS decreased during the 6 winter seasons (**Figure 3**), linear regression and linear quantile regression analyses for the 2005-2011 LOS data demonstrates a highly significant acceleration in the LOS decrease for the 2010-2011 season after implemen-

Table 2. Estimates of Mean Differences in Hospital Length of Stay (LOS) Obtained Using Linear Regression

	Change in LOS in 2010-2011 Compared to Prior Years			
	Without Covariate Adjustment		With Covariate Adjustment[a]	
Comparison	LOS, h, Estimated Difference (95% CI)	*P* Value	LOS, h, Estimated Difference (95% CI)	*P* Value
Direct Comparison of 2010-2011 LOS vs 2009-2010 LOS				
Difference in LOS				
Mean	−14.0 (−18.6 to −9.2)	<.001	−14.7 (−19.4 to −10.0)	<.001
Median	−17.0 (−23.5 to −10.5)	<.001	−19.2 (−23.9 to −11.6)	<.001
Comparison of Observed 2010-2011 LOS vs Expected 2010-2011 LOS Based on Prior Trend				
Difference in LOS				
Mean	−10.8 (−15.9 to −5.7)	<.001	−11.9 (−16.9 to −6.8)	<.001
Median	−10.0 (−16.9 to −3.1)	<.001	−16.4 (−21.8 to −11.0)	<.001

[a] Covariate adjusted models controlled for sex, age, and payer type. Estimates of differences in median LOS were obtained using linear quantile regression. A resampling procedure was used to obtain the 95% CIs for the differences in median LOS.

tation of the OU-HOT protocol (Table 2). When directly comparing the 2009-2010 and 2010-2011 bronchiolitis seasons, before and after implementation of the OU-HOT protocol, the proportion of patients admitted to the OU increased by 20.6%; 12.6% during the 2009-2010 season compared with 33.2% during the 2010-2011 season (**Table 3**). Although IU mean LOS did not change between the seasons (67.5 hours during the 2009-210 season vs 65.2 hours during the 2010-2011 season), OU mean LOS decreased by 47.8%, from 33.5 hours to 17.5 hours. The proportion of cohort admissions that were discharged on HOT increased between the comparison seasons (35% vs 46%). The increase in proportion of OU admissions discharged on HOT between the comparison seasons (30.6% vs 53.2%) was accompanied by a decrease in OU mean LOS (Table 3). For the 2010-2011 season, 15% of IU admissions were discharged in less than 24 hours compared with 75.8% of OU admission.

Despite expected fluctuations in bronchiolitis admission volumes since the implementation of a hospitalwide bronchiolitis pathway in 2005, using the OU-HOT protocol led to exaggerated decreases in LOS and increases in the proportion of patients being discharged within 24 hours. Overall, ED admission rates for patients with bronchiolitis, as well as ED revisit/readmission rates remained relatively stable from 2005-2011, ranging from 40.9% to 46.7% and 2.4% to 4.3%, respectively (**Figure 4**). The protocol was safe, with no reported apnea after discharge, and only 1 patient discharged from the OU was readmitted to the PICU 2 days after discharge for progression of respiratory distress, which was no different from readmission rates to the PICU in previous years. This patient did not require intubation.

Compared with the 2009-2010 season, the mean cost per admitted cohort case decreased by 25.4% ($4800 vs $3582, $P < .001$) after implementation of the OU-HOT protocol for the 2010-2011 bronchiolitis season. The proportion of patients who were discharged receiving HOT increased (35% vs 46%) for 93 additional patients on home oxygen support. Cost for supplemental oxygen, including tank delivery and pickup, were estimated at $22 per case across the entire cohort.

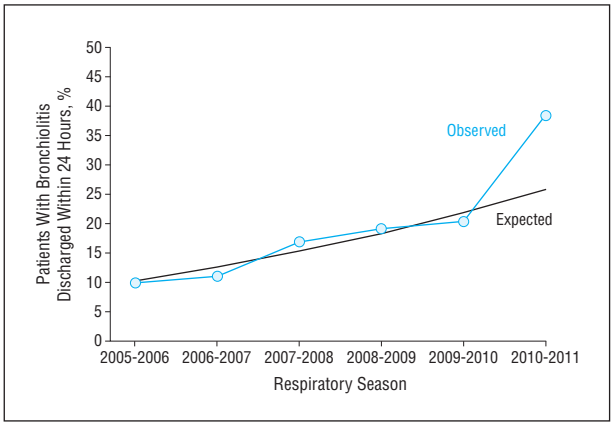

Figure 2. Proportion of bronchiolitis cohort admissions discharged within 24 hours by season from 2005 through 2011. A hospitalwide bronchiolitis care process was fully implemented for the 2005-2006 season, and the observation unit and home oxygen therapy protocol was implemented for the 2010-2011 season. Logistic regression analysis showed a highly significant increase in the proportion of patients discharged within 24 hours beyond the long-term trend ($P < .001$).

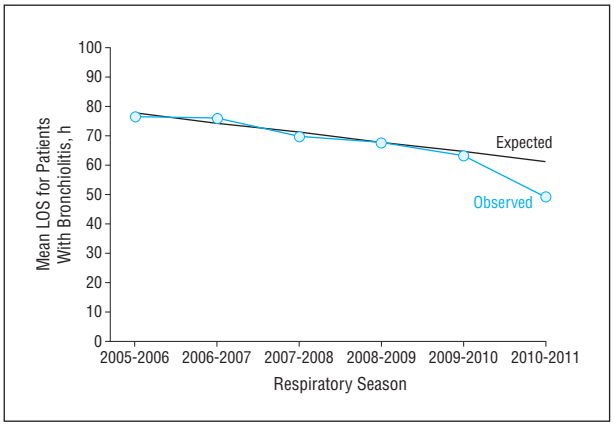

Figure 3. Mean hospital length of stay (LOS) in hours for bronchiolitis cohort admissions by season from 2005 through 2011. A hospitalwide bronchiolitis care process was fully implemented for the 2005-2006 season, and the observation unit and home oxygen therapy protocol was implemented for the 2010-2011 season. Linear regression analysis for mean LOS showed highly significant declines beyond the long-term trend ($P < .001$).

COMMENTS

Our study demonstrates that implementation of a new bronchiolitis care process aggressively using OU-HOT protocol, when indicated, led to a significant decrease in mean LOS by 14.0 hours (22.1%) compared with the previous season. The OU-HOT protocol resulted in 404 avoided patient hospital days for the 2010-2011 season (692 cohort patients × 14.0 hours decrease in mean LOS/24 hours). We established that the OU-HOT protocol was safe and not associated with an increase in ED revisits/readmissions.

Findings from our study show a significant decrease in hospital LOS by using OU-HOT. A recently published study evaluating an 8-hour ED-based observation protocol for hypoxic patients with bronchiolitis demonstrated that HOT reduced admission.[26] In the study, no significant increase was noted in readmission rates, along with no PICU admissions or advanced airway interventions on readmission. Many EDs, however, may not have the space, staffing, or logistical capabilities to implement an ED-based protocol to discharge hypoxic patients with bronchiolitis home receiving HOT. It was not until a protocol facilitating rapid discharge and HOT deployment was implemented in a dedicated OU, with its culture for rapid discharge, that dramatic gains in LOS and discharges within 24 hours were seen at PCMC. We believe that both elements of the protocol, OU and HOT, were critical to success and, therefore, cannot be independently evaluated for effect. Home oxygen guidelines at our hospital were unchanged in the preceding 5 years. Although the IU had an increasing proportion of patients discharged receiving HOT, LOS did not decrease significantly. Use of the OU with predetermined inclusion and exclusion criteria in the ED, along with clinical judgment of disease severity and the option for HOT in

Table 3. Mean Length of Stay (LOS) and Proportion of Admissions Discharged Receiving Home Oxygen Therapy (HOT) for Patients Admitted to the Inpatient Unit vs Observation Unit, Comparing 2009-2010 and 2010-2011 Seasons, Before and After Implementation of the Observation Unit and HOT Protocol

	Mean LOS, h (No.)			Proportion Discharge on HOT, No./Total No. (%)		
Season	Inpatient Unit	Observation Unit	Overall	Inpatient Unit	Observation Unit	Overall[a]
2009-2010	67.5 (634)	33.5 (91)	63.3 (**725**)	142/404 (35.1)	11/36 (30.6)	**153/440** (34.8)
2010-2011	65.2 (462)	17.5 (230)	49.3 (**692**)	156/356 (43.8)	116/218 (53.2)	**272/574** (47.4)

[a]HOT data were unavailable for 39% (285/725) of the 2009-2010 cohort and 17% (118/692) of the 2010-2011 cohort, and excluded from the denominator in this table.

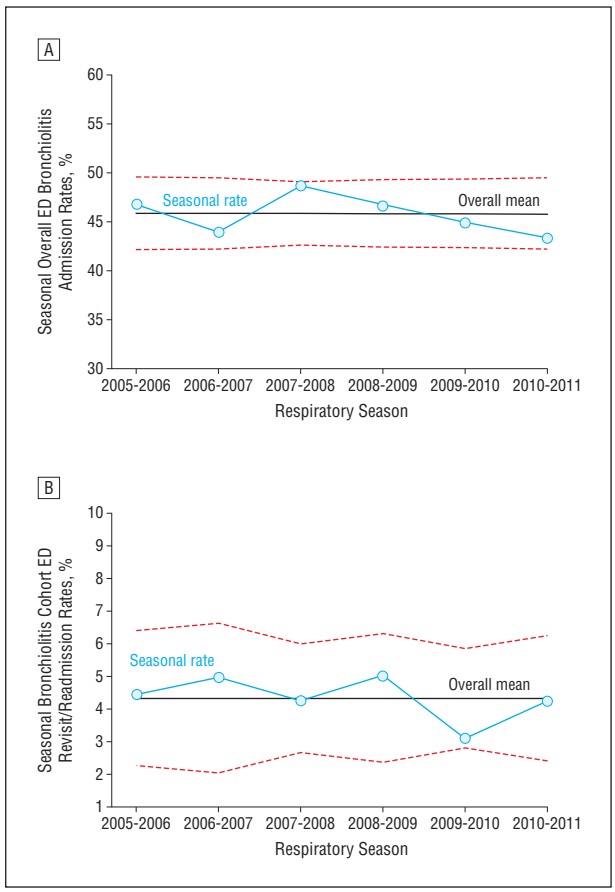

Figure 4. Statistical process control charts for seasonal overall emergency department (ED) bronchiolitis admission (A) and revisit/readmission (B) rates. At 3-SD control limits (dotted red lines), there were no outlier seasonal rates, and no discernable effect of the observation unit and home oxygen therapy protocol on overall ED bronchiolitis admission (A) and cohort revisit/readmission (B) rates for the 2010-2011 season.

suitable patients, allowed a large subset of patients to be discharged in less than 24 hours, impacting hospital mean LOS. Our well-developed activity-based cost accounting system demonstrated that the reduced inpatient LOS led to an estimated cost savings from 2009-2010 to 2010-2011 of approximately $830 000.[29]

Findings from our study demonstrate that a significant decrease in mean LOS and increase in discharges within 24 hours, along with expanded use of HOT, were not associated with any adverse events (eg, apnea, increased PICU admission rates, or need for emergent advanced airway management after discharge) or increases in ED revisit/readmission rates. Implementing the OU-HOT protocol did not increase bronchiolitis admission rates from the ED, which remained unchanged since 2005. This study and longitudinal experience in our facility and in Denver, Colorado, demonstrate that with adequate infrastructure and community acceptance OU care and HOT for hypoxic patients with bronchiolitis can safely reduce inpatient health care use.[26]

There are limitations to our study. This was not a controlled trial to determine the influence of OU care and HOT independently. Because the OU-HOT protocol was implemented simultaneously, it is impossible to know which intervention (use of an OU or use of HOT) was most influential in the outcome. However, we have shown that significant changes in LOS and discharge within 24 hours occurred after a rapid discharge protocol promoting HOT was implemented in the OU, suggesting the 2 changes worked in concert. The benefit of the OU itself, with a culture in promoting discharge within 24 hours, cannot be separated from the OU-HOT protocol. Transfer to the OU was an integral part of the intervention and we are unable to separate the OU component of the intervention from other components. Stratification of analyses by IU vs OU may produce results that would be difficult to interpret, since the clinical condition of patients sent to the 2 units may markedly differ. Furthermore, the complete set of clinical and patient characteristics defining the patients' condition are unavailable for analysis. In addition, due to inconsistency in provider discharge documentation, HOT data are unavailable for 39% of the 2009-2010 cohort and 17% of the 2010-2011 cohort (Table 3). The discharge documentation system used to extract HOT data, however, is not linked to hospital billing, and there is no reason to believe that provider omission of HOT discharge data was nonrandom. Our hospital is located at an altitude of approximately 5000 ft (to convert feet to meters, multiple by 0.3) above sea level. Given that hypoxia may be more common in patients with bronchiolitis admitted in higher-altitude regions, our experience may not be generalizable to lower-altitude regions. One might argue that HOT in higher-altitude regions would lead to a more dramatic decrease in LOS compared with lower-altitude regions. However, LOS for bronchiolitis is comparable across regions, and the clinical challenge of prolonged hypoxia in bronchiolitis is not limited to high-altitude regions.[18,20,22] Because HOT for hospitalized patients with bronchiolitis has been shown in one small trial to reduce LOS at sea level, a larger study in lower-altitude regions is in order.[24]

In our study, seasonal variation in patient type was limited. Case definition for the hospitalized bronchiolitis cohort has remained unchanged since the Bronchiolitis Guidance Team began annual systematic data collection and analysis in 2005, except for ongoing *International Classification of Diseases, Ninth Revision* coding updates. We did have a significant change in insurance payer mix and male sex mix between the 2009-2010 and 2010-2011 seasons. However, addition of these variables to a multivariable regression model did not demonstrate an independent effect on LOS. Despite variations in admission volume from 2005-2011, the rate of admission for bronchiolitis from our ED has remained unchanged, further suggesting that there are no systematic differences between the comparison years.

Although most of the published experience with HOT is at higher altitude, we believe that a similar protocol could be tested at lower altitude for any inpatient setting with appropriate staffing and infrastructure to promote discharge within 24 hours. Differences in saturation thresholds for hypoxia at lower altitudes must be accounted for and studied. We realize HOT shifts resources to outpatient settings in ways that have not been evaluated, and estimated cost savings of approximately $830 000 do not include outpatient PCP and respiratory care clinic visits. The overall cost savings to the system (both inpatient and outpatient care) would be less than our estimated savings, and although we believe hospital cost savings would far outweigh additional outpatient costs, a formal cost-effectiveness analysis that considers resource and cost shifting from inpatient care to outpatient management with HOT must be performed. Although this shifting has the potential of overburdening families and primary care providers, a previous study has shown high patient and primary care provider satisfaction with HOT, and this management option has commonly been used in our community for years.[23]

In conclusion, in this study, we demonstrated that implementing a bronchiolitis care process that incorporated a new OU-HOT protocol significantly decreased the mean LOS for patients with bronchiolitis and increased the percentage of patients discharged within 24 hours of admission. These changes were unassociated with an increase in ED revisit/readmission rate. Dramatic cost savings for our hospital were achieved. Further studies should focus on implementing a similar care process in other hospitals and assessing the impact on outpatient practice and overall health care use and cost.

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Conflict of Interest Disclosures: None reported.
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Poetry in Pediatrics

H. I. E.

You are G-tube, trach-dependent,
deaf, blind, devastated, orphaned, forgotten,
and 2 years old today.
You are an incredible teacher.
You are
cerebral palsy,
septic shock,
multidrug-resistant organisms,
broad-spectrum antibiotics,
pulmonary edema,
acute renal failure,
fluid resuscitation,
epinephrine,
chest compressions,
epinephrine,
sinus tachycardia.
I wonder . . . do you dream?
Of peppermint breezes and thrumming valleys,
burning bushes and albino woods,
bottomless sun and twisting caverns,
marshmallow clouds and rose-petal rains.
Of swiftwater farms with slow-flowing trickles
over cotton rocks past hand-dripped castles
under deafening moonrises through endless time
without shadow.
Without a shadow.
Of a doubt.
You are neither a carrot nor a cucumber.
What gift can I give you?
I will still say "good morning" when I enter your room.
Good.
Mourning.
Happy birthday.

Joshua Tyler Bonnema Williams, BS, BA

This poem was entered in the 2012 University of Chicago Pritzker Poetry Contest. Of more than 40 submissions from medical students, residents, and faculty, *H.I.E.* was awarded Grand Prize Honors in the Open Form category. A blinded, multidisciplinary panel of judges from medicine and the humanities judged all submissions. *H.I.E.* has not been previously published in a medical or literary journal.