measurable risk factors for readmissions for asthma treatment.

**Study Population.** All hospitalized children with a primary discharge diagnosis of asthma (International Classification of Diseases, 9th revision, code 493) at 2 large hospitals in St. Louis, Missouri, between January 1, 1990, and December 31, 1999, were included.

**Methods.** This was a retrospective analysis of children with asthma hospitalizations between January 1, 1990, and December 31, 1999. Data for admissions of patients with asthma were extracted from the billing databases of 2 hospitals for the 10-year period. Patient attributes of age, gender, race/ethnicity, residence, payer status, length of stay, and month of admission were compared between patients admitted once during that period and patients admitted multiple times. Extensive measures were undertaken to ensure that each patient’s hospital admissions for asthma were counted as accurately as possible. The main outcome measures were the total number of admissions and the time to readmission during the study interval.

**Results.** During the study period, there were 8761 children with 14,905 hospitalizations because of asthma. Of these, 6142 were admitted only once and 2619 (30%) were admitted more than once. There were a total of 6144 admissions (41.2% of total asthma admissions); 3525 of these were third admissions or more (23.6% of all asthma admissions). The largest numbers of admissions, both single and multiple, occurred among patients between 1 and 4 years of age. The ratio of African American patients to all other patients was 2.16 for single admissions and 4.38 for multiple admissions ($\chi^2$ test, $P < .0001$). The ratio of Medicaid or self-pay insurance to commercial insurance was 1.94 for the multiple-admission group and 1.29 for the single-admission group ($\chi^2$ test, $P < .001$). Prior admission was a more specific indicator of readmission, with greater positive predictive value, than ethnicity, insurance status, or their combination.

**Conclusions.** Readmissions for asthma treatment represented a substantial proportion of admissions, and there was a disproportionate association with African American race/ethnicity and low income, as indicated by insurance status. In addition, there was increasing risk for readmission with each subsequent asthma admission.

**Reviewer’s Comments.** This is a very interesting study with practical clinical applications. As noted, any readmission for asthma treatment should be used as an impetus for intervention. Inpatient hospital services represent the largest direct medical expenditures for asthma treatment; therefore, identification of asthmatics at high risk for readmission is critical. Interventions to improve overall asthma management, including environmental controls, adherence to a written asthma action plan with appropriate medications, and specific attention to psychosocial issues, should help decrease readmissions. Continued research in this area, with particular emphasis on successful interventions to prevent readmissions for asthma treatment, will be very welcome.

**Sensitivity of Spirometric Measurements to Detect Airway Obstruction in Infants**


**Purpose of the Study.** To demonstrate the ability of forced expiratory flow (FEF) volume curves from increased lung volumes to discriminate among infants with differing severities of respiratory symptoms and to compare the ability of variables used to quantify the flow volume curves to detect airway obstruction.

**Study Population.** Infants referred to a pediatric pulmonary clinic were classified into 2 groups. Group 1 patients had previous respiratory symptoms but were asymptomatic on the date of evaluation. Group 2 patients were symptomatic with current respiratory symptoms, such as coughing, rhonchi, or wheezing on the date of evaluation. A control group included 155 healthy infants.

**Methods.** Before spirometry, infants received 50 to 75 mg/kg chloral hydrate orally; measurements were obtained while the infants were sleeping in the supine position. Forced expiratory maneuvers were performed with the increased-volume, rapid-thoracic compression technique. Flow volume curves were quantified with forced vital capacity (FVC), FEF at 50% of FVC, FEF at 75%, forced expiratory volume in 0.5 second (FEV$_{0.5}$), and FEV$_{0.5}$/FVC, which were expressed as $z$ scores.

**Results.** All variables except FVC had $z$ scores that were significantly less than 0 and distinguished groups 1 and 2 with progressively lower $z$ scores. The mean $z$ scores for the flow variables (FEF at 50%, FEF at 75%, and FEF at 25–75%) were more negative than the $z$ scores for the timed expiratory volumes (FEV$_{0.5}$ and FEV$_{0.5}$/FVC) for both groups. In general, measures of flow identified a greater number of infants with abnormal lung function than did measures of timed volume; FEF at 50% had the best performance in detecting abnormal lung function.

**Conclusions.** Forced expiratory maneuvers performed with the increased-volume, rapid-compression technique could discriminate among groups of infants with respiratory symptoms of differing severity. Measures of forced expiratory flow were better than timed expiratory volumes in detecting abnormal airway function.

**Reviewer’s Comments.** Because routine, standardized, spirometric measurements among infants with respiratory diseases were not readily available in the past, several investigations used the increased-volume, rapid-thoracic compression technique to assess lung function in this age group. This study extends the body of evidence obtained with this technique and highlights the importance of forced expiratory flow measurements as being better than timed expiratory volumes in detecting abnormal airway function in this age group. The challenge remains to develop this technique into a more practical procedure that can be incorporated into routine clinical practice.

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**Environmental Exposures**

**Effects of Ambient Air Pollution on Symptom Severity and Medication Use in Children with Asthma**


**Purpose of the Study.** To investigate the short-term effects of ambient air pollution on asthma symptoms and medication use among children with persistent asthma.

**Study Population.** A total of 133 children (5–13 years of age) with mild/moderate asthma were studied. The mean duration of asthma was 5.3 years. The children were enrolled from 1 center participating in the Childhood Asthma Management Program study. During the run-in period of the Childhood Asthma Management Program study, before being placed on 1 of the study controller medications
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