RESEARCH LETTER

"Nebs No More After 24": A Pilot Program to Improve the Use of Appropriate Respiratory Therapies

Nebulized bronchodilator therapies ("nebs") are commonly used in the inpatient setting for the treatment of obstructive pulmonary symptoms. Nebs have equal efficacy when compared with metered-dose inhalers (MDIs) for patients with obstructive pulmonary symptoms but are significantly more costly because they need to be directly administered by a respiratory therapist (RT). Unnecessary neb administration in the hospital also represents a missed opportunity to educate inpatients on proper use of their MDIs. Press et al found that while 86% of patients incorrectly administered their prescribed MDI, all were able to achieve mastery following instruction.

We created a program to decrease inappropriate neb administration, improve inpatient MDI teaching, and increase resident physician knowledge of appropriate respiratory therapies.

Methods | We performed a needs assessment at our 600-bed academic medical center and determined that over $1 million in direct costs were spent for administration of nebs to non–intensive care unit patients in the medical ward during fiscal year 2012.

Using direct cost financial data from our institution, we created a basic financial model. This model accounted for differences in direct pharmacy costs of neb and MDI medications, as well as RT time directly spent administering nebs and teaching MDI technique.

Results | Prior to implementation, we averaged approximately 5 neb administrations per admission (for any cause) on our high-acuity medical ward. Our preliminary results demonstrate that overall nebs administered per month and number of nebs per patient fell by more than 50% on the pilot unit following our initial interventions (Figure). Based on our financial model, these improvements on only this single ward would save an estimated average of $20,827 in direct costs for our medical center each month, resulting in approximately $250,000 annually.

Prior to implementation, 49 of 74 eligible internal medicine residents (66%) completed our pretest survey. Thirty-two of 48 eligible residents (67%) completed the postintervention survey. At both baseline and following our

We assessed changes in resident physicians’ knowledge and attitudes regarding nebulizer and MDI use using preintervention and postintervention surveys. These anonymous surveys queried residents regarding the costs and efficacy of nebs vs MDIs, as well as their beliefs about MDI training adequacy.

We analyzed changes in knowledge (percentage answering a question correctly) before and after the intervention using χ² statistics and Fisher exact tests as appropriate.

We implemented system changes, along with educational and promotional efforts, to encourage transitions of nebs to MDIs “within the first 24 hours of admission” (interventions and timeline are shown in the Figure). We monitored neb administrations on the pilot unit, our high-acuity medical ward, to determine the impact.

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intervention, residents were aware that albuterol neb treatments were more expensive than albuterol MDIs (82%, pre-test; 94%, postintervention [P = .11]). Prior to the intervention 13 of the residents (26%) answered incorrectly that neb treatments were more efficacious than MDIs, in contrast to only 1 resident (2%) following exposure to our intervention (P < .01). At baseline, none of the residents agreed that “patients receive adequate inpatient MDI teaching”; however, this rate improved to 16% after the first 2 months of implementation (P < .01).

Discussion | Our multifaceted intervention was associated with a simultaneous decrease in unnecessary neb treatments, an increase in evidence-based resident physician knowledge, and potentially an improvement in MDI patient education. This concurrent improvement in quality of care with a decrease in cost maximizes the “value equation” (defined as quality divided by costs). The approximately 50% decrease in nebs following our intervention highlights the degree of wasteful usage of this resource-intensive therapy previously on our pilot medical ward. Reducing inappropriate nebs represents a straightforward way for institutions to reduce health care costs through a simple intervention.

Our study has some limitations. Owing to the nature of our intervention and the significant crossover of our physicians, RTs, and nurses, it was not possible to create a control group at our medical center during this pilot study. Also, our financial model may overestimate our cost savings since RT time is a semifixed cost and our intervention has not yet led to a decrease in actual RT full-time equivalents. However, RT daily staffing is based on volume at our large hospital; thus, if the project is successfully scaled medical center-wide, then it would likely result in a decrease in daily RT staffing. Currently, this saved time is being repurposed for our RTs to perform other important job duties at our hospital, such as MDI training and smoking cessation counseling.

In conclusion, our pilot study illustrates that a multifaceted effort may be successful in dramatically decreasing the overuse of neb therapies on an inpatient medicine service. Reducing utilization of these resource intensive and unnecessary treatments may provide an ideal target for improving health care value.

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Documentation and Diagnosis of Overweight and Obesity in Electronic Health Records of Adult Primary Care Patients

Almost 69% of US adults are either overweight or obese (body mass index [BMI], calculated as weight in kilograms divided by height in meters squared, ≥25), yet clinicians often fail to diagnose overweight and obesity or discuss weight management with their patients. Many clinicians use electronic health records (EHRs), and adoption of EHRs has been increasing since the introduction of the Health Information Technology for Economic and Clinical Health (HITECH) Act in 2009. Electronic recording of vital signs—including height, weight, and BMI—is now one of the requirements for achieving “meaningful use” of EHRs, but few studies have examined rates of BMI documentation and diagnosis of overweight and obesity in EHR data. We conducted a retrospective study to examine these rates in the EHRs of adult primary care patients before the passing of the HITECH Act in 2009.

Methods | We evaluated patients at 25 primary care practices within a large academic care network in Boston, Massachusetts. We included adult patients (≥18 years) who had at least 2 visits with the same clinician between 2004 and 2008 and were not pregnant at the time of the visit. The study was approved by the Partners Human Research Committee.

Data were extracted from coded fields in the EHR. The primary outcome was documentation of at least 1 BMI in the appropriate coded EHR field at any time during the study.