



IS SPIROMETRY USED TOO LITTLE IN COPD PATIENTS?

by *Herb Patrick MD*

The original peer-reviewed research article selected this month to teach the Scientific Method is: MeiLan K. Han, Min Gayles Kim, Russell Mardon, Phil Renner, Sean Sullivan, Gregory B. Diette and Fernando J. Martinez. Spirometry Utilization for COPD: How Do We Measure Up? *Chest* 2007(Aug);132;403-409. We will continue to teach the traditional Scientific Method as: Background/Introduction, Question, Hypothesis, Methods, Results, Discussion/Reflections/Future Research, Conclusions, Acknowledgements, Conflicts of Interest and Bibliography.

The Background or Introduction of the research project explains interest in the topic and why the topic is significant. COPD is a leading cause of morbidity in the United States. COPD was the fourth-leading cause of death in 2002. Despite its high social and economic burden, COPD is a disease that is often under diagnosed or misclassified. The authors note that although international guidelines address spirometry as the standard for confirming the presence of COPD, there is evidence that spirometry is infrequently used to confirm the diagnosis of COPD. One part of their research project design was to assess the use of spirometry testing in patients with new diagnoses of COPD.

The Question being asked by the researchers designing this research project was: Are the majority of patients being given the diagnosis of COPD without having spirometry? (Note: The Question asked in every research project always has the possible answers: "yes" and "no.") The preconceived answer by researchers to the Question is called the Hypothesis. For this research project, the Hypothesis was: Yes, the majority of patients are being given the diagnosis of COPD without having spirometry.

The Methods for the research project describe the design and steps to answer the Questions. This research project did involve human subjects, but was based on retrospective review of existing patient data from insurance companies. Such a retrospective review of patient charts means that patient data were gathered "backwards" from the starting date of the research project approval. Prospective would mean that data were gathered "forward" from the starting date of the research project approval. Retrospective data review may not require each subject to sign consent approved by the Institutional Review Board (IRB). In this research project, retrospective data were analyzed for the eligible population from 2001 through 2003 and the research study was approved as expedited without consent needed. The authors selected a random sample of 150 patients from five insurance

plans to study: three commercial insurance firms, Medicaid, and Medicare insurance plans. Analyses were performed on patient data and claims data for spirometry testing. Each patient either had or did not have a claim for spirometry testing. Patients were analyzed by gender, by age and by insurance plans. Data from the health plans were converted into data files (SAS Institute; Cary, NC). Range, consistency, and reasonableness checks were conducted on each data set prior to being combined into a single data set for this research project. The data were analyzed using statistical software (SAS 9.1 for Windows; SAS Institute). A statistical value of p less than 0.05 was defined as statistically significant.

The Results totaled 1,424,513 health plan covered members who were commercially insured by the three plans, 83,621 who received Medicaid, and 89,615 who received Medicare. A total of 5,039 eligible patients (3,559 commercial, 347 Medicaid, and 1,403 Medicare) with a new diagnosis of COPD during the study period were identified. Sixty-five percent of patients were in the 40 to 64 year age range, and 53% were female. The Medicare population, as expected, exhibited a higher percentage of older patients with new diagnoses. The Medicaid population had more women (73%) with COPD than men (27%). This may simply reflect greater longevity of women compared to men.

The Discussion/Reflections/Future Research offers a comparison with similar research projects and a critique by the authors of their own research project, possibly suggesting modifications that would improve the quality of the research. In this research project, the authors found spirometry was uncommonly used for the diagnosis of COPD in studied managed care health plans in the United States. In the five participating health plans studied, the average rate of spirometry documentation in the two years prior to a new COPD diagnosis ranged from only 26% to 38%. There was little difference noted based on the type of health insurance plan. The authors noted that their data confirm those of an earlier but recent report of 34% spirometry utilization in a newly diagnosed predominantly older, male COPD patient population, managed in the Veterans Administration health-care system. Given the relatively low cost and low patient burden of spirometry, coupled with the potential for misclassification of COPD disease status when objective testing is not used, the authors noted that their

research project points to a tremendous opportunity to improve clinical practice in the United States. The authors point out another notable finding of their research project was that use of spirometry was especially rare in the elderly, suggesting a possible age bias against pulmonary function testing among the oldest patients, particularly those greater than 75 years of age. The authors described no significant difference between spirometry utilization between primary care providers and specialist providers for the study patients with COPD. They found slightly higher spirometry utilization in women 33.5% versus men 29.4% (significant at $p < 0.05$) and noted this difference in gender was particularly important because women in the United States now account for more hospitalizations and deaths due to COPD than men. The authors then reflected on several limitations of their research project: only five health plans participated and all were geographically located in the middle to eastern portions of the United States; there were several unanticipated problems with the quality of the patient chart abstraction data at one site; another limitation include the sensitivity of spirometry codes to picking up all spirometry as spirometry might have been performed but not billed to the insurance companies which were the source of the research database.

The Conclusion is the final summary of the research project. This research project demonstrated low usage of spirometry to confirm the diagnosis of COPD. Therefore, in this research project, the Hypothesis was supported, corresponding to a "yes" answer to the Question. (Note: When writing the Conclusion, the Hypothesis must be addressed whether it was supported or not.)

Acknowledgements credit those who assisted the research project, both by time/effort and by financial support.

Conflicts of Interest are listed for all participating in authorship of the research project. Conflicts include advisory board membership, ownership of stock, and receipt of services, honoraria or gifts from companies related to the research project.

The Bibliography section includes references to support the research as included in the manuscript by reference number. For this research project, there were 25 references.

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