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The JeffCare Preceptor Model for Asthma: A Primary Care Physician Tutorial Training Model

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ABSTRACT

The societal and economic impact of asthma is a well-documented phenomenon in this country. Despite improved knowledge and techniques of care, there have been signs of worsening morbidity/mortality and a seeming disconnect between physician and patients as regards communication of care strategies. In an attempt to fashion innovative educational strategies to enhance primary care physician (PCP) and caregiver efficiencies in improving patient outcomes (clinical and financial), the "Preceptor" model of one-to-one PCP/asthma specialist has been developed. Review of utilization and prescribing data demonstrates a clear pattern of statistically significant cost improvement in the aggregate care setting, as well as improved appropriateness of use of proper asthma medications. Use of the "Preceptor" model of PCP learning is an effective and unique way to enhance both caregiver knowledge and improved care efficiency in asthma management.

INTRODUCTION

CLINICAL IMPROVEMENT will derive from a balanced perspective of both quality and cost. The industry of disease management offers flexible approaches that can enable innovative and low-cost strategies to help operationalize improvement. Certainly, the employer industry, which pays a significant portion of health premiums, has begun to make its voice heard by way of the Leapfrog initiative,¹ and the industry as a whole has been profoundly influenced to focus on quality improvement initiatives to enhance patient safety and reduce medication errors.^{2,3} We are aggressively entering what can properly be

termed the "era of accountability" in the health care delivery industry, where evidence-based problem solving strategies are fast becoming determinants of success and failure for practitioners and health care systems.⁴ The emergence of the disease management discipline has offered opportunities to design innovative new learning methodologies for caregivers on the "front lines" of medicine, the primary care physicians (PCPs), to address identified gaps in the physician-patient educational nexus.⁵ Creating such models for PCPs is challenging given the lack of time today's practitioners have available for extraneous learning activities. Yet, reliance on traditional models of continuing learning may be insufficient for mod-

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ern learners, and the movement toward interactive and case-based models of continuing education is being demonstrated to have a more effective impact.⁶

Jefferson Medical College of Thomas Jefferson University in Philadelphia, PA has thus partnered with its physician hospital organization, JeffCare, Inc., to define such a new model of learning for its primary care network utilizing what we call the "Preceptorship" program. (JeffCare, Inc., is a wholly owned subsidiary of Thomas Jefferson University Hospital, responsible for network development and managed care contracting.) The primary focus of this program has been on asthma education and management. In Philadelphia, it has long been observed that there is a significant prevalence of asthma, especially in the inner city metropolitan service area of Thomas Jefferson University Hospital, with a disproportionate rate of deaths from this disease.⁷ Lang and Polansky⁸ noted that the rates of death from asthma have increased in Philadelphia, whereas concentrations of major air pollutants have declined within particular problem areas affecting the minority, poor, and African American populations. Clearly, improving educational approaches in asthma care for the front-line PCP caregivers is a compelling need.

An additional reason to pursue more effective modalities of provider education comes with the recognition that the cost of care from chronic asthma illness continues to rise.⁹ In 2000, the then Surgeon General, David Satcher, M.D., revealed data demonstrating a dramatic rise in cases of asthma over the last 15 years reflecting in the increasing drain on the U.S. economy: from \$4.5 billion in 1985 to \$10.7 billion in 1994.¹⁰ Estimates, of course, will vary based on the estimating methodology used. In a Centers for Disease Control and Prevention publication in the year 2000, direct and indirect costs associated with asthma during 1998 were an estimated \$12.7 billion.¹¹ Smith et al¹² noted asthma cost breakdown as follows: office visits, 12%; hospital outpatient visits, 11%; emergency room, 6.8%; hospitalization, 54.4%.

Clearly, given the societal and economic significance of this disease process, new models of caregiver education are warranted. Of special concern is the trend toward increasing

prevalence of asthma in our market area of metropolitan Philadelphia, which includes a large inner city population. Currently, nearly one out of 13 persons in southeastern Pennsylvania (7.4%, or 274,300 persons) report having asthma, representing 185,000 adults (6.6%) and 89,000 children (10.0%). The percentage of all persons with asthma in southeastern Pennsylvania has increased over 40% in the past decade. In 1991, 5.2% of persons had asthma compared with 7.4% in 2000.¹³

PROGRAM DESCRIPTION/METHODS

The Jefferson Health System is an integrated delivery system comprising several hospital systems in the tri-state metropolitan Philadelphia region. It includes the Albert Einstein Health Network, Frankford Healthcare System, Main Line Health System, Thomas Jefferson University Hospital, and Magee Rehabilitation Center and their various affiliates. It serves approximately 26% of the nearly 6 million living in the region and has approximately 750 PCPs and over 2,500 specialists in its various system networks.

The premise of our "preceptor model" focuses on matching a single PCP-learner with a disease specialist for a half-day session. PCPs affiliated with the Jefferson Health System were invited to participate in a continuing education program for asthma management. The two physicians work together, seeing patients and discussing primary care "pearls" of asthma care. In addition to the physician preceptorship, the office staff of each physician-learner received an in-service session by a professional asthma nurse practitioner in the use of an asthma "plan," metered dose inhaler technique, and proper use of the peak flow meter. The purpose of this additional feature was to ensure that patients of the PCP-learners would receive appropriate asthma education.

Both PCP-learners and preceptors were financially compensated for their time (typically a \$350 honorarium per physician for a half-day session, distributed by JeffCare, Inc.). The results reviewed include data from asthma claims (inpatient, outpatient, emergency room) for the year 1999, which preceded the inter-

vention program. This was compared with claims collected post-intervention in the year 2000. Participant PCP-learners were drawn from the entire Jefferson Health System network of PCPs. Letters of explanation and invitation were faxed on multiple occasions, as well as "direct detailing" visits by our clinical management and provider relations personnel. In this initial program recruitment effort, there were no attempts to preselect participants based on prior utilization behaviors or cost profiles. PCP-learners were included in this program based on their expressed interest in participating. The JeffCare, Inc., staff facilitated appointments, and asthma specialists in the system were matched with interested PCP-learners. Preceptor faculty were instructed to review the various diagnostic and treatment guidelines as supported by the National Institutes of Health guidelines for asthma.¹⁴

JeffCare, Inc., as a physician hospital organization, has been involved in a full risk-based insurance product since 1997. The significance of participation in such a full-risk percentage of premium arrangement is noteworthy as such arrangements allow for very reliable captive claims data by the risk-bearer, in this case Jefferson University Hospital's managed care division, JeffCare, Inc. JeffCare's risk arrangement was a full assignment of risk for which the health system bore total exposure for losses and catastrophic claims. Many other health systems in the United States have engaged in "partial" or lesser risk arrangements with managed care partners. Full-risk arrangements, if nothing else, allow the holder of risk a legitimate access to the claims activity for which they were involved. This enables a reasonable categorization of data outcomes for this review. Claims data relating to asthma care were reviewed retrospectively in an attempt to compare utilization data for 2 successive years' worth of claims. In essence, we were able to view costs and utilization for a given physician/practice before and after the preceptorship intervention. Data were culled in the aggregate from the JeffCare, Inc., database from its risk-based population of patients. These patient claims are from patients cared for by our physician-learners in this project. The prepaid capitation amounts were not factored into the

cost/utilization evaluation, as there was no clear way to segregate that portion of capitation that would apply to asthma-related care.

Owing to changes in plan participation, only the 32 PCP-learners directly affiliated with JeffCare, Inc., were studied for this analysis. While we have trained approximately 140 PCP-learners in the entire Jefferson Health System to date, only PCP-learners for whom we had risk-based data both pre- and post-learning intervention were included in the summary review in this article. Not every member of the Jefferson Health System hospital consortium was actively a part of the risk-based contract at the start of this intervention, and thus the reliability of pre- and post-intervention data would not be as firm as the included subset of PCP-learners used for this analysis. The JeffCare, Inc.-based physicians are spread across 25 capitated offices in southeastern Pennsylvania and southern New Jersey. Data from February 1, 1998 to June 22, 2001 were extracted from the entire claims database. Claims data for the 25 capitated offices were extracted from the larger data set. Only claims that carried a primary diagnosis code for asthma (ICD-9: 493.0, 493.1, 493.9) were included. Claims studied were for 1 year beginning from the date of the preceptorship intervention as compared with 1 year's worth of data prior to the intervention.

Outcomes used were actual paid amounts, and hospital bed days. These outcomes were grouped into two categories based on the date the PCP participated in the education program. Therefore, each physician is his/her own control. Student's *t* test was employed as the test of significance, with a critical *p* value of 0.05. Subgroups were examined based on age, gender, and site of care delivery. Data were compiled using Microsoft Access 97 and were analyzed with SPSS version 7.5.3.0 for Windows from SPSS, Inc.

RESULTS

Pharmaceutical utilization patterns in study group

While the initial set of data (Table 1) observes potential impact of the intervention model on certain utilization categories, Tables 2 and 3 look at potential pharmaceutical prescribing

TABLE 1. CLAIMS DATA FOR JEFFCARE, INC., PCP-LEARNERS

| | n | Mean paid amount | p | Total | Paid bed days ¹ | p | Total |
|----------------------|-----|------------------|-------|--------------|----------------------------|-------|-------|
| Total | | | | | | | |
| Pre | 691 | \$160.08 | 0.015 | \$110,615.28 | 0.1158 | 0.04 | 80.02 |
| Post | 931 | \$75.23 | | \$70,039.13 | 0.0591 | | 55.02 |
| Males | | | | | | | |
| Pre | 293 | \$105.76 | 0.549 | \$30,987.68 | 0.0819 | 0.762 | 24.00 |
| Post | 356 | \$84.52 | | \$30,089.12 | 0.0702 | | 24.99 |
| Females | | | | | | | |
| Pre | 398 | \$200.07 | 0.014 | \$79,627.86 | 0.1407 | 0.023 | 56.00 |
| Post | 575 | \$69.47 | | \$39,945.25 | 0.0522 | | 30.02 |
| Children (<18 years) | | | | | | | |
| Pre | 197 | \$74.01 | 0.007 | \$14,579.97 | 0.1066 | 0.02 | 21.00 |
| Post | 399 | \$46.71 | | \$18,637.29 | 0.0602 | | 24.02 |
| Adults (≥18 years) | | | | | | | |
| Pre | 494 | \$194.41 | 0.071 | \$96,038.54 | 0.1194 | 0.113 | 58.98 |
| Post | 532 | \$96.61 | | \$51,396.52 | 0.0583 | | 31.02 |
| Outpatient/office | | | | | | | |
| Pre | 559 | \$42.85 | 0.015 | \$23,953.15 | | | |
| Post | 787 | \$50.42 | | \$39,680.54 | | | |
| Emergency | | | | | | | |
| Pre | 57 | \$146.32 | 0.084 | \$8,340.24 | | | |
| Post | 71 | \$90.32 | | \$6,412.72 | | | |
| Inpatient | | | | | | | |
| Pre | 75 | \$1,044.31 | 0.048 | \$78,323.25 | 1.07 | 0.245 | 80.25 |
| Post | 73 | \$327.94 | | \$23,939.62 | 0.75 | | 54.75 |

¹The bed days column represents the mean number of inpatient days per person over the time period. The total column is the mean \times n.

impact that might relate to this intervention model.

In an attempt to evaluate impact on prescribing behaviors as a result of the preceptorship intervention, proprietary pharmaceutical industry data were accessed representing portions of eastern Pennsylvania, central and southern New Jersey, and portions of Delaware (NDC Health Information Services [Arizona], Inc.). This allowed comparison of the JeffCare, Inc., participants with regional prescribers who had not had similar preceptorship experience. All data for Table 2 used new prescription

counts between August 1999 and August 2000. The categories are defined as follows: asthma controller segment (Intal[®] [Fisons], Tilade[®] [Fisons], Aerobid[®] [Forest], Azmacort[®] [Rhone-Poulenc Rorer], Flovent[®] [Glaxo], Qvar[®] [3M Riker], Vanceril[®] [Schering], Atrovent[®] Inhalation Aerosol [Boehringer Ingelheim], Combivent[®] [Boehringer Ingelheim], Foradil[®] [Ciba-Geigy], Serevent[®] [Glaxo], Accolate[®] [ICI], Singulair[®] [Merck & Co.], Zyflo[®] [Abbott], Pulmicort[®] [Astra], Beclovent[®] [Glaxo]); total ICS (Aerobid[®] [Forest], Azmacort, Flovent, Qvar, Vanceril, Pulmicort, Beclo-

TABLE 2. PRESCRIBING PATTERNS OF PCP PARTICIPANTS

| | Eastern Pa NJ DE region | | | JeffCare participants | | |
|-------------------|-------------------------|-------------|----------|-----------------------|-------------|----------|
| | August 1999 | August 2000 | % change | August 1999 | August 2000 | % change |
| Asthma controller | 259,928 | 292,578 | 13% | 1,626 | 1,948 | 20% |
| Total ICS | 135,594 | 145,385 | 7% | 909 | 1,024 | 13% |
| Asthma relief | 288,220 | 286,736 | -1% | 2,063 | 1,858 | -10% |

ICS, inhaled corticosteroid.

TABLE 3. JEFFCARE LEARNERS COMPARISON OF ASTHMA PRESCRIBING HABITS FOR 1999 VERSUS 2000 AND 2001

| | August 1999 | August 2000 | p | August 1999 | August 2001 | p |
|--------------------------------|-------------|-------------|-------|-------------|-------------|---------|
| Asthma controller ¹ | 31.88 | 38.20 | 0.023 | 31.88 | 51.39 | 0.00006 |
| ICS | 17.82 | 20.08 | 0.142 | 17.82 | 22.78 | 0.04138 |
| LTM | 5.84 | 8.63 | 0.007 | 5.84 | 11.12 | 0.00844 |
| SABA ¹ | 40.45 | 36.43 | 0.102 | 40.45 | 34.33 | 0.09651 |

Data are from NDC Health Information Services (Arizona), Inc. LTM, leukotriene agents; SABA, short-acting beta-agonists.
¹New prescriptions.

vent); and asthma relief (albuterol, Maxair[®] [3M Riker], Proventil[®] [Schering], Ventolin[®] [Allen & Hanburys]).

Table 3 looks at the comparison of the JeffCare Learner group against their own prescribing behaviors over 2 years of observation.

Analysis

Table 1 reflects statistically significant support for the observation that total asthma care costs (outpatient and inpatient) for the sample of PCP-learners reviewed demonstrates an overall savings of about \$40,500 for the time period studied. In a breakdown analysis by categories including sex, age, as well as location/type of service, findings are consistent with the fact that participant-learners experienced a change in utilization behaviors following the preceptor experience.

Outpatient care costs increased post-intervention, signaling the likelihood of PCP-learners using a greater amount of outpatient services secondary to their preceptorship ex-

perience. Yet, inpatient costs for this group were dramatically reduced by a total of almost \$55,000.

In the review of pharmaceutical use (Table 2), the comparisons against regional use patterns are noteworthy (NDC Health Information Services [Arizona], Inc.). While the total ICS utilization for the regional group increased by 7% from 1999 to 2000, the Jefferson group showed a 13% overall increase post-intervention. Similarly, rescue therapy for the regional group dropped by 1%, whereas the Jefferson group showed a 10% drop. These are positive trends for the intervention group studied, as it was hoped that these patterns would manifest after formal preceptor education, and certainly consistent with the patterns manifested in utilization data in Tables 1 and 2.

Figure 1 (a graphical depiction of data in Table 3) is a review of the JeffCare, Inc., PCP-learners group comparing prescribing behaviors for the 1999 pre-intervention period with post-intervention segments for both years 2000 and 2001. Categories include total asthma con-

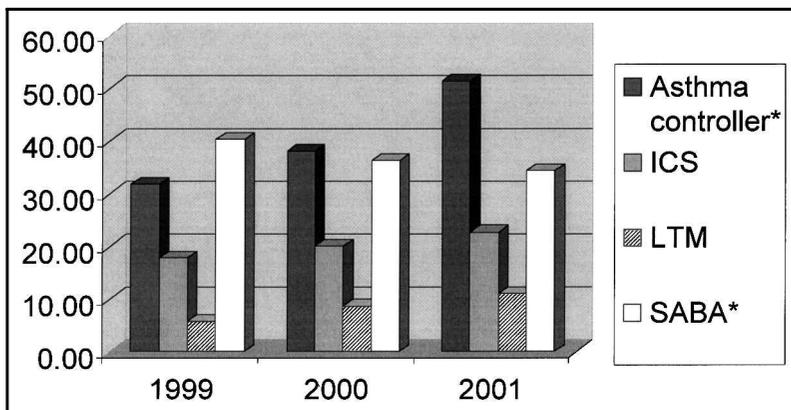


FIG. 1. JeffCare learners comparison of asthma prescribing habits for 1999 versus 2000 and 2001. *New prescriptions.

trollers, ICS, LTM, and SABA. This demonstrates a clear improvement in behaviors by the PCP-learners who participated in the preceptor program in their use and prescribing of asthma controllers, with an overall decrease in the use of rescue therapy medications, and an increase in the use of ICSs.

STUDY CRITICISMS

Unquestionably, the program was first designed solely as an innovative instructional model to promote improved primary care asthma intervention by our network of PCPs. Consideration of a formal patient study model was not the driving force behind this program. Nonetheless, care was taken subsequent to program implementation to cull data that were statistically valid in the comparison areas of interest. However, since the guidelines for preceptors were fairly "open-ended" and subject to variable interpretation, each PCP-learner may have had varying emphasis based on the bias of the preceptor involved. This can be controlled somewhat in future iterations by a more formalized and regimented structured set of minimal requirements for items a preceptor must include in a given session.

In attempting to define "value" to the program by the review of claims-based information, we readily acknowledge the difficulty in assigning hard savings as compared with the actual cost of running the program. We used a reliable "n" of PCP-learners who were in the full-risk program throughout the preceptor intervention time frame, and we reported a savings accordingly based on this number. Whether this can be extrapolated to the larger group of learners is pure conjecture. The true cost of the program to JeffCare, Inc., is small for no other reason than that we utilized staff already employed for various other physician hospital organization functionalities. Additional costs to JeffCare, Inc., would mainly be administrative time, office-based materials, phones, and the like. We did not attempt to configure these costs as part of the program, but suspect the amounts would not be significant under our particular framework of operations.

An additional question could be raised about the potential for "spillover" effect on practices impacted upon by the PCP-learner involvement and his/her staff's involvement with the in-service program. This was not a part of the scope of this particular effort, though worthy of future consideration in additional studies of this nature.

A significant program modification in the preceptorship model begins in early 2003. It will include the employ of professionally trained "standardized patients" in which PCP-learners will interview three or four special case studies in person and then be debriefed by one of our asthma specialists on campus. This should provide for a more uniform experience, easier evaluative feedback from our learners, and an ability to more efficiently utilize grant funds to train a larger number of participants.

We also have engaged in a new "partnership" model we call the "Triangular Partnership." Future preceptor programs will now include not only a Pharma industry partner, but also a managed care entity. In so doing, we will have more controlled and timely claims data analysis capabilities (clearly a constraint in this study as we were limited to a smaller "n" of participants for our own captive risk data). We are currently in the start of one such program (start date September 2002) and expect to begin a second "Triangular Partnership" in December 2002/January 2003. This additional "partner" brings significant value to future studies in terms of the availability of claims data that will not always be available in such efforts given the reduction of "risk assumption" models by health care systems in the near future.

An additional criticism can center on the validity of concluding that there is a "cause and effect" relationship between the utilization data and the fact that these participants were involved in such a program. There may indeed be other variables responsible for these outcomes that this evaluation cannot take into full account. Finally, the study does not account for patient satisfaction or quality of life change pre- and post-intervention. The study size required for this analysis was beyond the scope and resource of this effort, but such evaluative tools are available and well tested.¹⁵

DISCUSSION

The influence of local medical opinion leaders in the approach to innovative models of learning for PCPs is well demonstrated.¹⁶ We are of the view that combining the preceptorship experience with the nurse practitioner patient-training lessons for office staff offers the optimal training intervention for our network PCP-learners. We believe it will help to address one of the biggest challenges in asthma management, the noncompliant patient.¹⁷ In addressing the special needs of our inner city population, where asthma management can be most challenging, recognition of the fact that there is significant underuse of ICSs (despite admonitions from the National Institutes of Health asthma guidelines) and a greater need to impact the education of this population further underscores the importance of this approach.¹⁸ As noted in the self-critique, a "cause and effect" impact on propriety of asthma controlling agent prescribing is, at best, inferred. However, a pattern is suggested that warrants larger studies with a more direct tie to patient participation and involvement. If the "Preceptorship" model does lend toward a greater appropriateness of use of ICSs and decreased use of rescue therapies, then this interactive approach to physician education warrants further evaluation.¹⁹

CONCLUSION

The JeffCare preceptor model offers an innovative and interactive alternative to traditional continuing medical education-based didactic lecture format for continuing education of PCP-learners. The opportunity for inter-industry partnership is an attractive feature of the model, and physicians favor the informality of the one-to-one interaction with an asthma specialist. Preliminary claims data, as well as prescribing patterns in pre- and post-intervention years, suggest a possible relationship between this focused training model and improved utilization and more appropriate prescribing patterns. Use of the "standardized patient" model as well as pre- and post-physician-learner surveys for self-assessment of

preparedness for primary asthma care management issues will be necessary in future iterations of this program.

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