

# Asthma Care

## *in the Military Health System*

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*The asthma care study results underscore the important role that beta-2 agonist and inhaled corticosteroid prescriptions may play in preventing Emergency Department visits.*

### **W**hy study Asthma Care?

Asthma is a reversible reactive airway disease that can be life threatening if not properly managed. Its prevalence, morbidity and mortality have been well documented (Centers for Disease Control and Prevention (CDC), 2002; CDC, 2003). During FY02 asthma medication prescription rates in the Military Health System (MHS) were reported, however the extent of asthma and its treatment in the MHS has not been studied comprehensively. The purpose of this study was to provide a comprehensive description of asthma prevalence, medication treatment, and health service utilization for beneficiaries using Military Treatment Facilities (MTFs) for asthma care.

### **W**hat was the methodology?

The study population included beneficiaries 5 to 65 years of age. The timeframe for the study was July 1, 2000 through June 30, 2002. Beneficiaries were defined as having asthma if they had one encounter documented by the Standard Inpatient Data Record (SIDR) or Standard Ambulatory Data Record (SADR) in the Direct Care System (DCS) with a primary diagnosis of asthma (ICD-9-CM code 493.00 through 493.99). Beneficiaries with a history of cystic fibrosis (ICD-9-CM code 277.xx) or Chronic Obstructive Pulmonary Disease (COPD) (ICD-9-CM code 491.2, 491.21, 492.8, 496.xx) and those who died during an encounter were excluded

from the study.

Data from the Military Health System Management Analysis and Reporting Tool (M2) and the Pharmacoeconomic Center (PEC) were used to complete the study. Data from the M2 included purchased care data in the form of the Health Care Service Record Non-Institutional (HCSR-N) and HCSR Institutional (HCSR-I) claims, and direct care data in the form of SIDRs, and SADRs. The PEC provided direct care pharmacy data (Uniformed Services Prescription Database (USPD)), retail pharmacy data (Pharmacy Data Transaction Service (PDS)), and mail order pharmacy data (TRICARE Mail Order Pharmacy (TMOP)). The timeframe for data collection from all data sources was July 1, 2000 through June 30, 2002.

Data collected from M2 included demographic, treatment MTF organization, severity of illness, and health service utilization variables. Demographic variables included age group, duty status, and gender. Treatment MTF organization variables included Service, TRICARE Region, MTF, and clinic and provider specialty. Severity of illness was defined as the ICD-9-CM code with an asthma severity extender assigned to each encounter (Uniform Biostatistical Utility Working Group, 2002). Health care utilization variables included hospital admissions, emergency department (ED) visits and ambulatory visits.

Data obtained from the PEC included all pharmacy transactions for asthma medications. Asthma

medications were from the following classes of medication: inhaled corticosteroids (ICS), nedocromil and cromolyn sodium, leukotriene modifiers, methylxanthines, beta-2 agonists and oral corticosteroids.

Data were analyzed using Statistical Analysis System (SAS) version 8.2 statistical software. Asthma prevalence, medication use, and health care service use were described in the asthma population. Logistic regression analysis was employed to determine the relationships between asthma medications and ED visits and hospitalizations, controlling for other variables of interest. Supplemental analysis included comparison of variables between two 12-month time periods, Year 1 (July 1, 2000-June 30, 2001) and Year 2 (July 1, 2001-June 30, 2002).

Limitations of this study design and methodology include the inability to establish causal relationships between prescribed drug and limitations in the availability of civilian medication data. The PDTS database did not become operational MHS wide until April 2001. The TMOP database became operational in October 2000. Pharmacy data prior to the dates that these databases became fully operational were not available. Unavailable data could affect the analysis for any beneficiary who was seen in an MTF and chose to obtain medication prescriptions in the network or by mail order during Year 1 of this study.

Since the study relied exclusively on administrative electronic data, a future study of the accuracy of these records as sources of information for diagnoses and other clinical information would be helpful.

## **W**hat were the results?

### **Asthma Prevalence**

The study population contained 90,678 beneficiaries with asthma during the period July 1, 2001-June 30, 2002. The overall asthma prevalence was 2.4

percent. Higher prevalence was noted in females (2.9 percent), and the 5-9 year age group (6.8 percent). Twenty two percent (N=19,569) of the asthma population was Active Duty (AD). The prevalence for AD was 1.2 percent.

### **Asthma Medication Prescriptions**

Medication prescription rates were similar for Year 1 and Year 2 of the study for each medication class. The medications classes prescribed to the largest proportion of the study population were beta-2 agonists, 87 percent in Year 1 and 89 percent in Year 2 and ICS, 56 percent in Year 1 and 57 percent in Year 2. Beta-2 agonists were prescribed to a larger proportion of children (92 percent for age 5-9 and 10-17) than adults (86 percent), but ICS were prescribed for a greater proportion of adults (59 percent) than for children (53 percent for age 5-9 and 55 percent for age 10-17).

### **Health Service Utilization**

The study examined health service utilization patterns for ED visits, hospital admissions and non-ED ambulatory visits in beneficiaries with asthma. Overall, 17 percent of beneficiaries had an ED visit and 2.2 percent had a hospital admission during Year 2. Over 55 percent of the study population had no or one non-ED ambulatory visit for an asthma diagnosis during Year 2, while slightly more than 16 percent of the population used four or more visits with an asthma diagnosis.

Follow up care after ED visits and hospital discharges were examined by looking at outpatient visits within 14 days of discharge from care and ICS prescriptions for beneficiaries without an ICS prescription before the ED visit or hospitalization. Outpatient visits within 14 days were identified for 67 percent (N=10,122) of the ED visit population and for 89 percent (N=1,736) of the hospitalized population. New ICS prescriptions were identified for 28 percent (N=2,467) of the ED visit and 61 percent (N=554) of the hospital admission population.

## Relationship Between Asthma Medication and Health Service Utilization

A prescription for a beta-2 agonist or an ICS was associated with the least risk of an ED visit Relative Risk (RR=0.36 for beta-2 agonists and RR=0.58 for ICS) or hospital admission (RR=0.57 for beta-2 agonists and RR=0.88 for ICS). Additionally, the asthma care study results support the role of ICS prescriptions in decreasing ED utilization.

The ED logistic regression model confirmed the association of beta-2 agonists Odds Ratio (OR)=0.239, Confidence Interval (CI)  $\geq 0.226$ ,  $\leq 0.252$ ) and ICS medications (OR=0.571, CI  $\geq 0.544$ ,  $\leq 0.600$ ) with the risk of ED visits. The hospital admission logistic regression model confirmed association of beta-2 agonists with the risk of hospital admissions (OR=0.436, CI  $\geq 0.382$ ,  $\leq 0.498$ ).

## Conclusions and recommendations

The study findings portray a favorable picture of asthma care for MTF users when compared to published reports, however improvement is possible in follow up care for asthma patients after an ED visit or hospital admission. Additionally, the asthma care study results underscore the important role that beta-2 agonist and inhaled corticosteroid prescriptions may play in preventing ED visits.

Recommendations for further study include the following:

- Monitor DCS asthma medication prescribing rates
- Trend asthma ED visits and hospital admissions
- Study follow up care for asthma patients following ED or hospital encounters
- Educate providers concerning Clinical Practice Guideline (CPG) medication treatment modalities

- Study the issue of data accuracy as it relates to asthma diagnosis and use of asthma severity extender diagnosis codes

## References

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