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Implementation of the Asthma Practice Guideline in the Army Medical Department

Evaluation of Process and Effects

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Summary

The Army Medical Department (AMEDD) has made a commitment to establishing a structure and process to support its military treatment facilities (MTFs) in implementing evidence-based practice guidelines with the goal of achieving best practices that reduce variation and enhance quality of medical care. The Quality Management Directorate of the Army Medical Command (MEDCOM) contracted with RAND to work as a partner in the development and testing of guideline implementation methods for ultimate application to an Army-wide guideline program.

Three practice guideline demonstrations were fielded over a two-year period, in each of which participating Army MTFs implemented a different clinical practice guideline. All the demonstrations worked with practice guidelines that were established collaboratively by the Department of Veterans Affairs (VA) and Department of Defense (DoD).

This report presents results from our evaluation of the second of the three demonstrations, in which four participating MTFs implemented the asthma practice guideline in AMEDD’s Southeast Region demonstration. The evaluation included both a process evaluation to document the implementation activities of participating MTFs, and an analysis of effects to estimate the extent to which the sites’ implementation activities affected specific measures of service delivery for

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1 The first demonstration was for a low back pain practice guideline, which was implemented at four MTFs in the Great Plains Region. The third was for a diabetes guideline, which was implemented by two MTFs in the Western Region.
asthma, with comparisons to a group of similar MTFs that did not implement the guideline. The evaluation also looked at the effects of the implementation on MTF costs.

**Overview of the Military Health System**

The Army operates a health system with more than 40 MTFs across the country and overseas that provide health care to military personnel, their family members, and retirees. This system has a regional structure led by the Army Surgeon General and MEDCOM. The MTFs range from small community hospitals to large regional medical centers offering tertiary services, which provide both ambulatory care and inpatient services.

Separate from the military health care system is its health insurance program, called TRICARE, that covers health benefits for eligible military personnel, family members, and retirees. To augment the MTF services, TRICARE contracts with local community providers in the civilian sector to provide covered services. This insurance program has a managed-care option called TRICARE Prime. All active-duty personnel are automatically enrolled in TRICARE Prime and are assigned to an MTF-based primary care manager (PCM), which serves as a gatekeeper for all care. Military family members and some retirees also have the option of enrolling in TRICARE Prime, in which case they can choose either an MTF-based physician or a community provider for their PCM. Those who are eligible for TRICARE but choose not to enroll in TRICARE Prime are automatically enrolled in another TRICARE option through which they can decide where to receive care on a case-by-case basis.

**The Asthma Practice Guideline**

The principal emphasis of the DoD/VA practice guideline for primary care management of asthma is on effective management of asthma, including medication management, with the goal of pre-
venting exacerbations that require treatment interventions. The guideline has four key elements: initial asthma diagnosis; asthma management procedures to classify asthma severity, treat based on severity, provide preventive maintenance, and educate patients on self-care; emergency management of asthma exacerbations; and telephone triage to assess severity of exacerbation and review the action plan with the patient.

Implementation of the Guideline

Four MTFs in the Southeast Regional Medical Command served as demonstration sites for implementation of the asthma guideline: Eisenhower Army Medical Center (AMC) at Fort Gordon, Georgia; Blanchfield Army Community Hospital (ACH) at Fort Campbell, Kentucky; Martin ACH at Fort Benning, Georgia; and Moncrief ACH at Fort Jackson, South Carolina. These four MTFs represented diverse patient populations, facility sizes, and service mixes. In preparing for implementation, MTF commanders designated a “guideline champion” at each facility to lead the implementation process, a facilitator to coordinate the MTF’s implementation activities, and an implementation team with representatives from the various clinical groups involved in asthma care.

A systems approach was applied in the AMEDD practice guideline implementation demonstrations. This approach sought to ensure successful practice change in MTFs by addressing two main dimensions: building local ownership or “buy-in” from the staff responsible for implementing the new practices and ensuring that clinical and administrative systems are in place to facilitate staff adherence to the guideline.

The asthma guideline was introduced in September 1999. To prepare for implementation, MEDCOM held a kickoff conference to introduce the implementation teams from participating MTFs to the practice guideline and to provide monitoring metrics and a toolkit of materials to support the MTFs’ implementation activities. At the conference, MTF teams developed action plans for implementing the
guideline. After the conference, each MTF team began to implement activities it defined in its plan. Although the MTFs varied in how quickly they started implementation, all of them were pursuing their planned actions by January 2000.

The RAND Evaluation

The evaluation of the asthma practice guideline demonstration consisted of both a process evaluation and an analysis of the effects of the guideline on service utilization.

Process Evaluation. We took a formative approach to the process evaluation in which we learned from the MTFs’ experiences, provided feedback to the MTFs and MEDCOM, and facilitated shared learning among the MTFs. To gather evaluation information, we used a “climate survey” conducted during the kickoff conference; interviews, focus groups, and surveys, which were conducted during two evaluation site visits; and monthly progress reports prepared by participating MTFs.

Effects Analysis. The analysis of the effects of the guideline on service utilization used a time-series, comparison-group design to estimate effects of the demonstration on six indicators of care that could be measured using available administrative data. These measures and associated hypotheses are shown in Table S.1.

We compared measures for baseline performance (one year before introduction of the asthma guideline, January through December 1999) and performance at one year following introduction (January through December 2000) for the four demonstration sites and six control sites. We estimated MTF costs of care for asthma patients and assessed how costs changed with guideline implementation.

Each MTF provides asthma care not only to patients enrolled with a PCM at its facility but also to patients enrolled in TRICARE

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2 The first site visits took place in February and March 2000. The second site visits took place in September 2000.
Table S.1

Asthma Indicators and Associated Hypotheses

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term controllers</td>
<td>Increase in percentage of asthma patients using long-term controllers (inhaled corticosteroid, leukotriene inhibitor, Beta2 agonist/CS, or oral corticosteroid)</td>
</tr>
<tr>
<td>Complementary maintenance medications</td>
<td>Increase in percentage of asthma patients using complementary maintenance medications (Beta2 agonist/LA or methylxanthine)</td>
</tr>
<tr>
<td>Short-acting rescue medications</td>
<td>Increase in percentage of asthma patients using short-acting rescue medications (Beta2 agonist)</td>
</tr>
<tr>
<td>Outpatient visits</td>
<td>Decrease in asthma-related outpatient visit rate per 1,000 asthma patients</td>
</tr>
<tr>
<td>Emergency room visits</td>
<td>Decrease in asthma-related emergency room visit rate per 1,000 asthma patients</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>Decrease in asthma-related hospitalization rate per 1,000 asthma patients</td>
</tr>
</tbody>
</table>

Prime with a PCM located elsewhere and others who have chosen the more open TRICARE coverage option. Recognizing this variety of patients, three patient groups were considered in the evaluation of guideline effects: the entire population of TRICARE-eligible asthma patients treated by Army MTFs or who resided in Army MTF catchment areas and were served by network providers, all asthma patients who used one of the demonstration or control MTFs for inpatient or outpatient services at least once during a year (MTF users), and asthma patients who are enrolled in TRICARE Prime and have a PCM at one of the demonstration or control MTFs (MTF enrollees), who are a subset of the MTF users.

The patient group used as the sample for assessing effects of asthma guideline implementation was the MTF enrollees at the demonstration and control MTFs. The distinction between the MTF enrollees and other patients served is important for this study. For patients with such chronic diseases as asthma, MTF-based PCMs have the span of control to manage care for the patients who are enrolled with them. However, MTFs have much less ability to manage care for patients they only see intermittently.
Baseline Performance on Key Performance Measures

We first characterized the total population of asthma patients (those who used an Army MTF or resided in an Army MTF catchment area in the continental United States) during the two-year study period. An estimated 121,500 asthma patients were served during the first of our two study years and an estimated 121,000 patients were served during the second study year. This population consists primarily of Army family members, individuals affiliated with other military services, and family members of retirees. Patients are fairly evenly distributed across age groups. The asthma populations served by the individual MTFs vary widely in size, reflecting differences in the sizes and characteristics of the beneficiary populations residing in their catchment areas.

In examining data for demonstration and control MTFs, we distinguished between MTF enrollees and MTF users. Although the majority of asthma-related outpatient or emergency room visits were for MTF enrollees (patients who were enrolled in TRICARE at the MTF that provided their care), a substantial portion of patients seen were other MTF users (enrolled at other MTFs or civilian network sites). By contrast, the MTFs’ own enrollees accounted for virtually all asthma-related inpatient care provided by these MTFs.

The baseline comparisons of outcome measures for the study sites show that many of the indicators varied only moderately across the MTFs at baseline. For the three medication indicators, in particular, MTFs had similar percentages of patients using each type of medication. For some service-use indicators, such as emergency room care and hospitalization, one or two MTFs had either much higher or much lower levels than the other MTFs in the sample. However, the importance of these differences depends on how the actual performance at each site varies from recommended guidelines, where applicable.

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3 This population was defined using International Classification of Diseases, Ninth Revision (ICD-9), diagnosis codes in administrative data.
Lessons from the Process Evaluation

Performance on the Critical Success Factors

Research on practice guideline implementation has documented that a commitment to the implementation process, including use of multiple interventions, is required to achieve desired changes to clinical practices. Drawing on this literature as well as the experiences observed in the earlier AMEDD low back pain guideline demonstration, we identified six critical factors that influence how successful an MTF will be in integrating new practices into its clinical and administrative processes. We assess here the extent to which MTFs in this demonstration realized these success factors, which in turn affected their progress in implementing practice improvements.

• Command leadership commitment at the MTF, regional, and system levels. Management leaders at all three levels of AMEDD influence how front-line personnel perceive what priority the system places on the use of practice guidelines.

This demonstration had somewhat more positive support from the leadership of the participating MTFs than had been provided in the low back pain demonstration, but attitudes by regional and system-level leadership still were mixed. In the MTFs, the command team supported the implementation teams as they instituted the guideline, but this support generally was passive and MTF commanders did not exert full ownership locally.

• Monitoring of progress. Both the local MTFs and MEDCOM have roles in monitoring the quality of health care practices according to evidence-based standards defined in practice guidelines and roles in providing feedback needed for effective performance improvement.

The monitoring activities in the demonstration had a mixed track record. The focus of the demonstration MTFs was on using medical chart data to document the extent to which the new clinical
practices they had introduced were in fact being used—e.g., to document asthma severity in the chart. Such a focus helps to ensure that these practices are becoming an integral part of clinic processes as intended. Other than the analysis performed in this evaluation, MEDCOM did not monitor asthma metrics during the demonstration but relied on data generated by the MTFs.

- **Guidance and support to the MTFs by MEDCOM.** The structured approach and toolkits of supportive materials provided are resources that support the MTFs as they carry out actions to improve clinical practices.

By the time the asthma guideline demonstration began, MEDCOM had expanded its staffing and other resources, and we observed its staff providing regular policy guidance and technical support to help the MTF teams implement practice improvements for asthma care. During the site visits, the implementation teams at the demonstration MTFs reported this committed MEDCOM support was helpful to them and they were pleased to have it.

- **Guideline champions who are opinion leaders.** There is extensive evidence of the importance of having a designated clinical leader to serve as champion for the practice improvements being pursued.

The participating MTFs identified well-respected physicians to serve as guideline champions for the asthma demonstration, and these physicians showed a commitment to leading the implementation activities for their facilities. However, the champions could only make a time-limited commitment to the initiative, after which they tired of the concentrated effort or had to turn their attention to other priorities.

- **Resource support for champions.** To serve effectively as a guideline champion, the designated champion needs to be given adequate dedicated time and other resource support. This sup-
port also signals that the MTF command places a priority on guideline implementation.

The MTF commanders did not provide tangible resource support for the activities of the guideline champions, other than for attendance at the kickoff conference. As a result, the champions performed the implementation work in addition to their regular workload, which contributed to their reluctance to sustain the champion role. Facilitators designated by the MTF commander provided some staff support for the champions, a role that was part of the facilitators’ regular responsibilities because they worked in the MTF quality management offices. The delayed implementation of the MTF action plans stemmed in part from competing demands on the champions’ time.

- **Institutionalization of new practices.** For sustainability, the new practices being introduced need to be integrated into the standard practices of the facility as quickly as possible.

At the time of the last process evaluation site visit, the participating MTFs had made progress in introducing improved asthma management practices in some of their primary care clinics, but they had not yet achieved sustainable practices in those clinics. None had yet begun to extend the new practices into other clinics serving asthma patients that had not participated in the demonstration.

In summary, we observed reasonably good performance on some of the success factors in this demonstration. The most noticeable positive items were the MTF efforts to monitor their progress in implementing the intended practice changes and selection of effective champions. MEDCOM also was able to provide responsive support for the asthma demonstration. It appears that lessons learned from the earlier low back pain demonstration contributed to these management results (see Farley, Vernez, et al., 2003). Although the participating MTFs identified effective champions, the champions were not given dedicated time to help them perform their additional roles. Competing demands on champions’ time weakened the teams’
actions to introduce and sustain improved clinical practices, as well as effects on clinical practice indicators.

Other Lessons from the Demonstration
Other lessons learned from the implementation include the following.

Strategies. The MTF were given the flexibility to design strategies that best met their needs. They used it to emphasize different components of the guideline and to undertake a variety of actions for change. Some risk is involved in this approach, however, that a team might pursue only expedient actions that are not resisted by clinical or administrative staff, which would slow progress toward the achievement of consistent practices across the AMEDD system.

Monitoring. Although the MTF teams took initiative to monitor asthma measures during the demonstration, several issues arose that require further attention. The data collected by the MTF teams were neither communicated to clinic staff to give them empirical knowledge of their performance on key aspects of care nor used to create accountability for performance. Measurement issues also were identified, including difficulty in retrieving administrative data the MTFs needed for monitoring, inconsistencies in chart abstraction processes, and inaccurate coding of asthma visits.

Standard Forms. The standard asthma encounter documentation form developed by MEDCOM received mixed reactions by providers because the form did not fully meet their needs. Because MEDCOM made the use of the form voluntary, many MTFs and primary care providers chose not to use the form, preferring to develop and use their own forms. Inconsistent use of the form makes it difficult to monitor performance because the needed data are incomplete.

Provider Training. The MTF learned that multiple and ongoing training sessions would be required over time to train all primary care providers effectively on the asthma management processes specified in the guideline. The first training sessions reached only a fraction of the MTF providers, and continued training also was needed to refresh
their knowledge and to train newly arrived providers who rotated in from previous MTF assignments.

**Patient Education.** The provision of patient education on self-care was one of the weaker components of the implementation activities. Patient behaviors affect the MTFs’ ability to achieve the intended asthma care practices and outcomes. How a patient handles the preventive aspects of asthma management will influence the frequency and severity of asthma exacerbations. Inadequacies in MTF patient education activities were identified, including problems with program design, limited receptivity of providers to referring patients for education, and limited patient attendance at the programs when referred.

**Effects of the Demonstration on Service and Costs**

**Effects on Performance Measures**
The RAND analysis found no significant changes in the six clinical practice indicators we identified for evaluating the effects of the asthma practice guideline demonstration. All three indicators for use of asthma medications declined from the first to second study year, which was the reverse of the hypothesized direction of change. Outpatient visit rates for the demonstration MTFs did not change from the first to second year, although we did observe seasonal variations in rates. For emergency room visit rates and hospitalization rates—which represent potentially avoidable health-care events that should decline as asthma management improved—we found no changes in rates during the demonstration.

There could be several explanations for these null findings. The most obvious is that the practice improvements the MTFs implemented were not sufficient to achieve changes in the measures. However, it also may be too early to detect some changes, such as reduced hospitalization rates. Alternatively, other practice changes might have occurred within the health-care encounters that were not captured adequately in these measures of encounter frequency. For example, opposing effects might be interacting in which better classification of
asthma severity moved more patients to mild intermittent levels, which would offset reclassifications to higher severity levels with unpredictable net effects on use of asthma medications.

**Patterns and Trends in MTF Costs**
The analysis of MTF costs revealed a decrease between the first and second study years in per-patient costs for the MTF enrollees at the demonstration MTFs, after adjusting for cost trends for the control MTFs (which control for temporal effects on use rates). Despite our inability to observe changes in the indicators we were tracking, it is possible that early practice changes made by the MTFs in introducing the practice guideline may have decreased the costs of care for enrolled patients served by the MTFs. If their actions did contribute, a likely source of effects would be changes in outpatient service mix or in the intensity of care during hospitalizations. However, other factors might also be contributing to the changes in service-use patterns that led to the observed cost reductions. Inpatient-use rates and costs should be tracked over time to identify trends and longer-term effects, as new care management methods become stronger.

**Data Issues**
Accurate assessment of MTFs’ performance in implementing treatment guidelines requires the capability to routinely generate accurate and reliable data on the indicators monitored. Pertinent to this need, we identified three critical data issues that need to be addressed:

- **Inconsistent coding of diagnoses and procedures.** Effective monitoring of performance in treating asthma (or some other condition) requires consistent coding of diagnoses and procedures in the outpatient encounter records. MEDCOM has established standard codes for asthma, but at the time of the demonstration these codes had just been introduced and were not used consistently by the demonstration MTFs.
• **Unavailable data.** At the system level, the data needed to calculate many indicators (e.g., laboratory or radiology data) were incomplete, were obtained from separate data-extraction processes of varying quality, or were not currently available.

• **Absence of an asthma registry.** The Army health system lacks a centralized registry that can provide complete information on all asthma patients in the system and can be accessed by MTFs wherever they may be. In the absence of this data resource, asthma patients might not be identified or information on their past care and asthma status might be lost as personnel and their families move to new locations.

**Recommendations**

Ultimately, a practice guideline cannot be said to be implemented until lasting changes in practices are made. Yet all of the MTFs participating in this demonstration had difficulty integrating the new practices into the normal, ongoing MTF clinic operation. This finding highlights the need for focused attention by the leadership of MEDCOM and the MTFs to communicate clearly that achieving best practices is a system priority. It also highlights the need to continue to reinforce MTFs’ implementation activities through technical support and effective monitoring to provide feedback to the MTFs on their progress.

We summarize here our recommendations for improving the implementation of the asthma guideline.

• **MEDCOM needs to establish consistent monitoring standards for performance metrics.** To achieve this consistency, standardized coding for patient status or procedures will need to be implemented effectively across the Army MTFs. MEDCOM will also need to consider whether it wants to establish a centralized system to collect the data directly from automated data systems or to have MTFs collect and analyze data locally and then report to MEDCOM.
• **MEDCOM should work with the MTFs to establish performance objectives on the asthma metrics.** To ensure that performance information is used to improve clinical practices, monitoring of the asthma metrics should be integrated in the MTFs’ quality management or peer review programs and the MTF commanders should review processes and results regularly.

• **MEDCOM should develop software programs necessary to allow the MTFs to retrieve Composite Health-Care System (CHCS) and Ambulatory Data System (ADS) data.** MTFs currently have difficulty retrieving ADS and CHCS data for use in the monitoring process. To address this difficulty, the MTFs requested that MEDCOM provide them with the “ad hoc” software programs needed to extract the data.

• **As MEDCOM monitors the asthma metrics across MTFs, it needs to identify where improvements in quality and consistency of care are needed.** The MTFs were given considerable flexibility to develop implementation strategies. While this flexibility helps to ensure that each team can address the clinical practices most in need of improvement at its own MTF, it can also risk slowing progress toward the AMEDD goal of achieving consistent practices across facilities. By continuing to monitor the metrics closely over time, MEDCOM can determine whether to give greater direction to MTFs regarding which aspects of the guideline are to be emphasized and implemented uniformly.

• **MEDCOM needs to establish clear procedures and expectations for the use of forms.** Although sites were told that the use of the forms provided by MEDCOM was voluntary, participants at some of the MTFs still thought that use of the forms was mandatory. Other sites chose not to use the forms, but they did not apply alternative methods to ensure that asthma diagnosis and treatment were being documented appropriately. MEDCOM needs to forge a policy regarding the use of forms that supports efficiency and value for providers and patients, particularly for patients with multiple conditions for which more than one guideline may apply.
• **MEDCOM needs to further define the role of patient education in treatment processes of chronic conditions, while MTFs need to ensure that they are using the most effective patient education techniques.** The issue of patient education has increased in salience for AMEDD because many of the guidelines it has implemented are for chronic conditions that require self-care management by patients for effective overall management of the condition. MEDCOM needs to establish clear standards for patient education and ensure that MTFs have adequate resources and tested educational methods.

• **MTFs need to integrate training on clinical guidelines into their ongoing education for existing personnel as well as into the orientation sessions for both incoming primary care providers and ancillary staff.** Implementation teams often found that the training session on guideline implementation turned into a discussion of whether to implement the guideline rather than how to implement it. To train all primary care providers to desired levels of knowledge, multiple and ongoing training sessions would clearly be required over time, as providers deployed or rotated in and out of the MTFs.

• **MTFs need to integrate new practices into normal clinic operation—i.e., the way they “do business” for patient care.** A practice guideline cannot be said to be implemented until such lasting changes in practices are made. To help MTFs make lasting practice improvements, MEDCOM needs to communicate clearly that achieving best practices is a system priority, and it should continue to support and reinforce the MTFs’ efforts by providing technical support and establishing an effective monitoring system to track and provide feedback to the MTFs on their progress.