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Implementation of the Diabetes Practice Guideline in the Army Medical Department

Final Evaluation

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Summary

Background

The Department of Defense (DoD) and Department of Veterans Affairs (VA) initiated a collaborative project in early 1998 to establish a single standard of care in the military and VA health systems. This initiative established evidence-based clinical practice guidelines for selected conditions that would be applied in all DoD and VA health facilities. Each practice guideline is a statement of best practices for the management and treatment of the health condition it addresses. For each guideline, the DoD/VA Working Group designated an expert panel to develop the guideline contents and relevant metrics, which were made available for use by the military services and VA health-care facilities.

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 AMEDD 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.

Taking the approach of testing new methods on a small scale, AMEDD fielded three demonstrations over a two-year period, each testing different clinical practice guidelines. All three of the practice guidelines—for lower back pain, asthma, and diabetes—were established collaboratively by the VA and DoD. This report presents the

results from a RAND evaluation of the diabetes practice guideline demonstration. The principal emphasis of the practice guideline for primary care management of diabetes was on effective management of blood-sugar levels with the goal of preventing short-term complications and long-term effects on organ systems.

The key elements of the Diabetes Practice Guideline were the following:

- patient evaluation,
- achieving and maintaining glycemic control,
- patient education and counseling, and
- early detection and management of diabetic complications.

Approach

AMEDD began the demonstration process in AMEDD's Western Region with a kickoff meeting in December 1999 (implementation processes and tools are summarized in the list below). Two MTFs participated in the demonstration as designed: Madigan Army Medical Center (AMC), Fort Lewis, Washington, a large, urban specialty medical center, and Bassett Army Community Hospital (ACH), Fort Wainwright, Alaska, a small hospital at a remote outpost. Three other Army MTFs concurrently implemented the diabetes guideline in a separate demonstration.[1] Data for all five MTFs were included in the evaluation of guideline effects.

The following processes and tools were used in guideline implementation:

- the practice guideline and metrics,

[1] In this three-year demonstration of a program called TRICARE Senior Prime, DoD contracted with Medicare to offer Medicare managed-care plans in six locations for DoD beneficiaries who also were Medicare-eligible. One participation requirement for the Senior Prime plans was to implement a quality improvement initiative; diabetes care was chosen. The three sites for which data were included in this report were Brooke AMC at Fort Sam Houston, Texas, Evans ACH at Fort Carson, Colorado, and Reynolds ACH at Fort Sill, Oklahoma.

- a guideline toolkit of materials to support implementation activities,
- a kickoff conference to develop implementation action plans,
- MTF implementation activities to carry out the action plans, information exchange between teams and with MEDCOM to share experiences and build on successes,
- ongoing support of MEDCOM to include revision and development of toolkit items, and
- monitoring of implementation progress by both MEDCOM and the participating MTFs.

RAND's evaluation included an assessment of the implementation process, an attempt to establish preimplementation baseline measurements as benchmarks, an assessment of the effects of the guideline implementation on care processes one year later, and an evaluation of methods available to and developed by AMEDD to measure outcomes at its facilities. The specific methods and data used in the evaluation are described in Chapter Two and Appendix A.

Implementation Evaluation

Earlier demonstrations had shown the value of using a systems approach, which involved achieving "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 purposes of the *process evaluation* were to document the actions and experiences of the participating MTFs; identify areas where AMEDD policies, systems, and processes could be strengthened; and assess the degree to which AMEDD can apply lessons from the demonstration to implement the diabetes guideline across its system. A participant-observer approach was used to learn from the MTFs' experiences, provide feedback, and facilitate shared learning among the MTFs. Information was collected from the participating MTFs through two site visits (one at four months and one at ten months), monthly progress reports prepared by the MTFs, and questionnaires completed by individual participants.

The Outcomes Evaluation

The purposes of analyzing the outcomes of guideline implementation were to document the extent to which intended actions were actually implemented by the MTFs, monitor short-term effects on service delivery methods and activity, and develop and test metrics and measurement methods that can be adopted by the MTFs and MEDCOM for routine monitoring of progress. Outcomes were evaluated using two sets of indicators. First, the participating MTFs assessed their own compliance with a set of indicators developed by the nationwide Diabetes Quality Improvement Project (DQIP) and adopted by the DoD/VA Diabetes Working Group as guideline metrics. RAND established a second set of five outcome indicators that could be measured using administrative data from the DoD health system. Of these five indicators, one—annual eye examinations—reflected DQIP standards. The other four were primary care visits, use of oral hypoglycemic agents, emergency room (ER) visits, and inpatient stays. Other DQIP indicators could not be assessed using administrative data. These included foot exams, referrals to diabetes education services, and assessment for nephropathy because such information was collected and stored only at the local MTF level.

To assess the effects of the demonstration, we used a time series, control comparison design to assess changes in values of the MTFs' performance indicators over time. While the kickoff meeting was held in December 1999, we considered April 1, 2000, to be the date when the guideline might impact patient care and thus defined the baseline period as the year preceding this intervention date. To control for temporal trends that might account for observed changes in the indicators, we also compared the data for the demonstration sites to those of a set of matched control MTFs that had not implemented the diabetes guideline. These comparison MTFs were selected for similarity to the demonstration MTFs. For the time trend comparisons, we analyzed one year of baseline data for the demonstration sites (April 1999 through March 2000) and one year of data collected after introduction of the guideline (April 2000 through March 2001).

The patient sample used for these analyses was a subset of all patients who were enrolled in TRICARE Prime at one of the five

demonstration MTFs (the two MTFs in our demonstration plus the three Senior Prime MTFs) or five comparison MTFs during the study period. For each indicator, we calculated averages for the sample of diabetic patients continuously enrolled at each MTF during the baseline period and an overall average value for both control and demonstration MTFs.

To gain perspective on how the demonstration participants reflected diabetes patients served by Army facilities, we also documented the number and characteristics of all DoD beneficiaries who were identified as having diabetes and who used an Army MTF at any time during the study period, based on International Classification of Diseases, Ninth Revision (ICD-9), diagnostic codes on MTF encounter records, or network provider payment claims.

Findings and Implications

Army medical facilities served close to 220,000 diabetic patients during the first year of our study and more than 230,000 diabetic patients during the second year, more than half of whom were personnel, retirees, or family members of other (non-Army) military services. Among those affiliated with the Army, all but a small fraction were either retired Army personnel or their family members. Only a small number were active-duty Army personnel: Overall, 42.8 percent of the diabetic patients in the first year were 45 to 64 years of age, and 46.2 percent were 65 years of age or older. The percentages were similar for the second study year.

The patients in our sample used both MTFs and network providers for their diabetes care. Only 61.8 percent of total diabetes-related visits to MTF outpatient clinics or ERs were by patients enrolled in TRICARE Prime at the MTFs. Another 37.6 percent of these MTF visits were for nonenrolled patients, and less than 1 percent of the visits were for patients enrolled with network providers. By contrast, all but a small percentage of diabetes-related hospital inpatient stays at MTFs were for their own enrollees. This finding has

implications for both patient management and outcome measurement.

Baseline Diabetes Care Performance Measures

Baseline values varied considerably for all indicators: average number of primary care visits per 100 patients, percentages of non–insulin dependent patients who were treated with oral agents, percentages of diabetes patients who had at least one eye examination during the year, rates of ER visits, and rates of inpatient stays. No practice guidelines yet define the optimal number of primary care visits and the use of oral agents because appropriate measures depend on individual patient needs and clinical judgment. Nevertheless, the wide variation in practices among facilities suggests that under- or overtreatment may be a concern. Baseline levels of annual eye exams, an indicator for which guidelines exist, were uniformly low, suggesting the need to investigate possible underlying causes.

Critical Factors for Implementing Practice Improvements

Drawing on published literature on implementation of practice guidelines and the implementation experiences observed in the AMEDD lower back pain and asthma guideline demonstrations, we identified six factors that critically influence the successful integration of new practices into clinical and administrative processes. We assessed the performance of the diabetes guideline demonstration MTFs on these factors.

- **Command leadership commitment at the MTF, regional, and corporate levels.** The diabetes implementation teams had the support of both the MTF commands as well as the leadership of the TRICARE Region 11 Lead Agent office, which planned to implement this approach for other MTFs in the region.
- **Monitoring progress.** The performance of the demonstration MTFs in the area of monitoring was mixed. Of the two demonstration MTFs (not including the Senior Prime sites), one actively measured trends in performance on the DQIP measures,

while the other MTF struggled to extract the needed data in the face of inadequate staffing levels and technical problems with its data system. Data system barriers also prevented both MTFs from establishing a local diabetes registry.

- **Guidance and support to the MTFs by MEDCOM.** By the time the diabetes guideline demonstration began, MEDCOM had well-established staffing and other resources and was providing policy guidance and technical support to help MTFs implement practice improvements for diabetes care. We believe MEDCOM's committed support has been a strong foundation for the practice improvement efforts of the demonstrations.
- **Guideline champions who are opinion leaders.** The participating MTFs identified well-respected physicians to serve as guideline champions for the diabetes demonstration, and these physicians showed a commitment to leading the implementation activities. However, the champions were permitted to make only limited commitments to the initiative.
- **Resource support for champions.** Although both MTF commanders authorized the champions to lead the implementation of the diabetes guideline, neither champion received tangible resource support for the activities (other than attendance at the kickoff conference). Nevertheless, facilitators designated by the commanders at both MTFs were responsible for providing staff support for the champions.
- **Institutionalization of new practices.** The participating MTFs made some progress toward achieving practices consistent with the diabetes guideline, focusing on areas where their performance on DQIP measures was the weakest. To achieve sustained improvements, they will need to both conduct regular education sessions for providers, clinic staff, and newcomers to the MTF and deliver regular feedback to providers on performance trends for the DQIP measures.

Effects of the Demonstration on Performance Measures

Data from both the local MTFs and the centralized data system can and should be used for monitoring progress of the MTFs on per-

formance indicators for diabetes care (or any other health condition). Based on process evaluation information and our analyses of encounter data, we examined trends reported by the demonstration MTFs for the DQIP performance indicators they monitored, and we also analyzed trends in diabetes care service utilization that we could obtain from administrative data for both demonstration and control sites.

MTF Monitoring of DQIP Indicators. Four of the five demonstration MTFs reported that they had begun to collect data on the DQIP measures using either their clinical data systems or medical charts as data sources. Three of these MTFs reported an improvement in their performance between baseline and 12 months into the demonstration. Such improvements could lead to an eventual reduction in diabetes complications and associated avoidable health-care events (e.g., ER visits or hospitalizations).

In our review of the materials the MTFs provided, several issues arose regarding data quality and comparability across MTFs, including incomplete or ambiguous indicator definitions (e.g., percentage of patients receiving a lipids panel versus the percentage of patients with LDL levels in the normal range).

RAND Analysis of Service Utilization Trends. The performance of the demonstration MTFs on the service delivery indicators we measured did not change substantially between baseline and the end of the first demonstration year:

- Primary care visit rates held steady during the first two quarters of the first demonstration year and then decreased in the last two quarters.
- Use of oral hypoglycemic agents at demonstration MTFs increased from baseline during the demonstration period, as expected, but this increase did not differ significantly from that of the control MTFs.
- The percentage of patients with diabetes-related annual eye examinations increased significantly at demonstration MTFs, but it was not clear whether this was a real increase or the result

of improved coding for the diabetes diagnosis on the encounter records.
- Neither ER visit rates nor hospitalization rates—indicators of potentially avoidable health-care events—changed during the demonstration.

RAND Analysis of MTF Cost Trends. The introduction of the diabetes practice guideline did not appear to affect MTF costs in the first demonstration year:

- As a proportion of total costs of diabetic care per patient and per MTF, costs of care for nonenrollees was substantial at both demonstration and control hospitals. Nonenrollee inpatient costs far exceeded enrollee inpatient costs. Many of the nonenrollees were over-65 Medicare recipients.
- For enrollees, per-patient costs at demonstration hospitals exceeded those of control hospitals for both inpatient and outpatient care and in both study years. From year one to year two, average per-patient costs for both outpatient and inpatient care increased slightly at the demonstration sites, while at the control sites, outpatient costs rose slightly and inpatient costs fell.
- For nonenrollees, per-patient costs at demonstration hospitals were comparable to or slightly less than those of control hospitals for both study years. From year one to year two, average per-patient costs for both outpatient and inpatient care fell slightly at demonstration sites, while at the control sites, outpatient and inpatient costs rose slightly.
- From one MTF to another, per-patient costs for both outpatient and inpatient services varied widely.

The contrast between improvements on the DQIP indicators reported by the demonstration MTFs and the virtual absence of changes in the cost indicators we analyzed suggests that our measures did not capture the full dynamics of the process changes made by the MTFs to achieve their reported improvements on the DQIP indica-

tors. While administrative data can be used to count events (e.g., visits), they cannot be used to assess the contents of those events (e.g., diabetes education, foot exams, or referrals). Although we were familiar with the action strategies of the two MTFs in the AMEDD demonstration and the specific processes they were attempting to modify, we could not develop indicators that measured those changes using administrative data, with the exception of annual eye exams.

Other possible contributors to the apparently limited effects of the demonstration include the following:

- the time between implementation and measurement may have been too short for the guideline to have affected diabetes complications sufficiently to be reflected in ER and inpatient care rates;
- some of the demonstration MTFs already had been working on improving diabetes care before the demonstration;
- the TRICARE Senior Prime MTFs included in the analysis were not fully supported by RAND and MEDCOM;
- data were not available at the MEDCOM-level for the measures targeted by the MTFs' action plans;
- data quality issues existed for patient identifiers, coding, and clinical laboratory and pharmacy data;
- MEDCOM lacked centralized support for data acquisition and monitoring.

The very real barrier created by inadequate availability of healthcare data not only hinders the ability to measure the progress of the MTFs in diabetes care practice improvements but also weakens the improvement process itself by depriving the MTFs and MEDCOM of the feedback needed to guide adjustments to the quality improvement actions being taken by the MTFs. This barrier will continue to slow progress in improving practices under the diabetes guideline as well as other guidelines. The ability of MEDCOM to alleviate the burden on its MTFs to establish a valid process for data collection

and monitoring will increase the likelihood that meaningful improvements in diabetes care will be achieved.

Recommendations

Although the MTFs participating in the diabetes practice guideline demonstration had some notable successes in some aspects of improving diabetes treatment practices, resource limitations and organizational barriers curbed the overall progress. Provided here are some additional lessons learned and recommendations.

Implementation

- *Allow for flexibility:* Flexibility in implementation strategies can help ensure that each MTF can address the clinic practices most in need of improvement and reflect unique capabilities, but it may put more responsibility on each MTF for defining its own direction, and it also may slow progress toward the AMEDD goal of achieving consistent practices across its facilities.
- *Provide and ensure adequate resources:* Provision of additional resources, including regular education sessions and feedback to providers, to support implementation activities would help the champions and teams achieve lasting improvements in practices.
- *Learn from experience:* MEDCOM should continue to strengthen its system in response to the lessons identified in the process evaluation for this demonstration as well as its experience in previous demonstrations.

Benchmarking of MTF Performance

- *Measure progress:* To provide an empirical foundation to guide performance priorities, MEDCOM and the MTFs should use baseline service data as an integral part of the regular monitoring for effective diabetes care to identify facilities at greatest variance from established standards and identify factors contributing to the variance. Interventions should be undertaken to correct identified performance problems.

Outcomes Measurement

- *Document variations:* MEDCOM should continue to document variations in performance on key indicators across MTFs on a regular basis to identify areas where improvements in quality and greater consistency are needed.
- *Select indicators and apply them carefully:* It is important to institute a set of indicators that are widely in use across the country, including instructions on how to calculate the measures. In addition, careful measurement of the numerators and denominators for performance indicators will be required to ensure effective monitoring of progress.
- *Educate and engage providers and staff:* Educating and actively engaging both providers and clinic staff on the diabetes practice guideline can help achieve sustainability of improved practices.
- *Include patient education as part of implementation:* Patient education is an important aspect of diabetes care, especially for the new diabetes patient. Further assistance by MEDCOM might be useful to enhance the ability to reach all patients and offer comprehensive education for managing the various aspects of their diabetes.
- *Provide ongoing monitoring and technical support:* The achievement of sustainable practice improvements can be encouraged by MEDCOM through ongoing monitoring and technical support for the implementation activities of the Army MTFs. Also, to successfully introduce and consolidate new habits among a large number of providers and clinic staff, implementation activities require not only resources but also time to mature.
- *Develop a patient registry: For* patients with chronic conditions, such as asthma or diabetes, a registry would provide a centralized repository of pertinent data that could be shared by all MTFs as the patients move around the military system. Although AMEDD does not have centralized registries, many of the local MTFs are attempting to establish them for their patient populations.
- *Improve centralized data collection:* Two approaches for improvement may be considered. MEDCOM could establish a central-

ized system that collects the data directly from automated data systems, performs analyses in the central office, and generates trend reports to the MTFs. Alternatively, the system could use data collected and analyzed locally by the MTFs and reported to MEDCOM, which then would aggregate the individual MTF results into trend reports.

Costs

- *Track and monitor service use and costs of time:* MEDCOM should continue to track inpatient use rates and costs over time. As cost information accumulates, it should be possible to distinguish trends related to practice changes from normal fluctuations in health-care needs from year to year.