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## FINAL GRANT REPORT

IDENTIFYING EFFECTIVE ELEMENTS OF MANAGED CARE: RELATING THREE  
MANAGED CARE SETTINGS, THEIR USE OF ACOEM TREATMENT  
GUIDELINES, AND WORKERS' COMPENSATION OUTCOMES

GRANT ID # 034365

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## Project Objectives

The purpose of this project was to assess providers' compliance with ACOEM treatment guidelines for occupational low back and hand / wrist injuries in 3 distinct clinical settings, and to evaluate the association between provider practices and patient outcomes. The four primary (original) objectives of this project were:

1. To develop a non-proprietary, data-scannable clinical assessment tool based upon the low back and hand and wrist ACOEM Treatment Guidelines that can be used to reliably collect prospective information in multiple clinics in different states.
2. To explore insurance data supplied by four clinical organizations for its reliability and ease of use as outcome measures.
3. To prospectively measure adherence to the recommended provider actions in low back and hand and wrist ACOEM Treatment Guidelines in four different clinical organizations.
4. To suggest future directions for research and advise managed care providers and consumers on factors in managed care and treatment guidelines which are strongly associated with compliance.

Over the course of the project, we were able to meet some of these objectives and amended others in response to external barriers that we encountered.

### Objective 1

A clinical assessment Tool was developed using Telform software. The Tool consisted of a data-scannable history and physical clinical report. We sought input from physicians from multiple institutions to assure a format consistent with common medical reporting practices. Our goal was to develop a Tool that could serve as the medical record for the clinics as well as provide relevant data for measuring adherence to treatment guidelines.

The data elements on the forms were developed by first establishing a list of all of the pertinent provider determinations necessary to establish compliance with actions required in the **ACOEM** Treatment Guidelines. The Project Director developed the draft compliance variables and then completed the final variables with input from the consultants on the grant, as well as from the clinic directors and other outside experts. When the compliance variable definitions were completed, the first draft of the forms was circulated for comment from the clinics participating in the study at that time, i.e. those located in Michigan, California and Colorado. Changes were made to reflect the needs of the physicians and clinics for additional information to complete a patient medical record. There was disagreement on several elements. Therefore a one-day meeting was held in which all 3 clinic directors and the project director came to agreement on the data elements to be included in the finalized tool. We completed development of four assessment forms, an initial visit and follow-up form for both low back and upper-extremity injuries, and compliance variable criteria.

We field-tested our Tool at the clinics that had originally committed to participate in the project. Providers were asked to use the Tool on a sample of cases and provide feedback on content, format and practicality. In response to the pilot, we made final revisions to the forms and prepared them for

distribution. The final Tool consisted of 260 and 270 data elements for the initial low **back and upper-extremity cases** respectively. The follow-up forms, which collected additional information about risk factors for recovery and disability status, consisted of 185 and 241 data elements for these respective injuries. The Tools used in the project are found in the Bibliography. Refer to the bibliography for compliance variables, the demographic forms for patients and provider, and instructions to the clinics for form completion.

## Objective 2

Although we set out to collect insurance billing data from all participating sites, we were only able to obtain complete data from one participating organization (who had originally committed to participate) and partial data from another. Nevertheless, this limited data provided a means of examining the feasibility of using billing information to measure cost outcomes for occupational injuries. A more complete description of these analyses may be found in the bibliography.

## Objective 3

### Clinic Recruitment

In order to measure adherence across clinics with various management structures, we attempted to recruit seven occupational health clinics representing HMO, fee-for-service and preferred -provider networks. Clinics were asked to participate by having their providers complete the patient evaluation forms (Tools) for cases presenting exclusively with low back and upper extremity injuries. Providers were given the option of completing the forms either during the appointment, in lieu of using their standard reporting forms, or after the visit, in addition to their usual dictation and medical records. Clinics were asked to forward the completed forms to our staff for scanning.

Although several of the seven clinics who initially agreed to participate in the study, participated in the pilot phase, only two clinics provided non-pilot data for this study. Prior to implementing the project at these sites, Dr. Mueller provided on-site or teleconference training regarding use of the forms by the designated providers. Refer to Bibliography under Sponsored Workshop, Session 11, for the training materials and physician instructions.

### Data Collection

Participating clinics provided data on 97 cases: 53 low back and 44 upper-extremity injuries. In total, we received 69 initial and 137 follow-up evaluation forms for these cases from the clinics. An additional 359 records were obtained through chart review. The data was scanned locally and imported into an ACCESS database.

### Analysis

Although we had intended to measure adherence to ACOEM guidelines among various clinical structures, the significant reduction in the number and type of participating clinics and of viable cases precluded us from using these analyses to report representative practice patterns.

Due to the unexpected complications, we amended our original objective to include the following additional analyses: 1) descriptive analysis of practice patterns of care by injury type; 2) quantitative analysis (validation study) to assess the ability of the forms to accurately collect clinical data; and 3) qualitative study to identify useful components of the forms as well as barriers to using the forms in clinical settings.

In order to validate the accuracy and completeness of data obtained from the Tool relative to that documented in the medical record, and to identify areas in which the forms may provide more (or less) information than that found in the record, we performed a chart review on 70 cases from one participating organization. Using the information contained in the medical chart, we completed a second patient evaluation on each case and then compared the data with that obtained from the original completed form. We found that 93% of the data elements were in agreement. Refer to the following table for details.

**Chart Review Compared to Physician Report**

	Agreement	Disagreement
Low Back / Initial	92%	
Low Back / Follow-up	92%	8%
Upper Extremity Initial	93%	7%
Upper Extremity Follow-up	91%	9%

\* Includes areas in which either report had a result not contained in the other report or in which there was a conflicting report.

Because we sought to develop a Tool that could ultimately be used in practice and that would be acceptable among varying management structures, we developed a survey to allow providers to rate and comment on the content and format of the Tool, and on logistical issues such as the time and effort that it took to use the forms. We also asked them to comment on how the forms might be improved upon or used more effectively in clinical practice.

We distributed our survey to all providers who had contributed cases to the study and to those who participated only in the pilot. We also mailed our survey to active members of the ACOEM guidelines committee. Ten providers completed the survey. The detailed responses are found in the following tables. We will make final changes to the forms in response to comments and suggestions on the survey (NOTE: All of the final changes will be made after completion of the compliance variable assessment.)

**I. Demographics of Surveyed Physicians**

**Survey Takers**

Average Age:	51
Male:	6
Female:	4

**Specialty**

Occ. Med:	4
Internal Med:	2
Family Practice:	2
Occ. & Internal:	1
Other:	1

**Experience In Occupational Medicine (years)**

1 or less:	0
2 to 5:	3
more than 5:	7

**Number of Cases Done Using Form (per Doctor)**

None:	2
1 to 10:	4
More than 10:	4

II. Results of Physician Survey

**Time to Fill Out Forms (in minutes)**

All

**Initial Evaluation**

Range: 5 to 15

Mean: 9

**Follow-up**

Range: 3 to 10

Mean: 6

**Combined**

Range: 8 to 20

Mean: 15

<10 Forms

**Initial Evaluation**

Range: 5 to 15

Mean: 9.5

**Follow-up**

Range: 5 to 10

Mean: 6

**Combined**

Range: 10 to 20

Mean: 16

>10 Forms

**Initial Evaluation**

Range: 5 to 10

Mean: 7

**Follow-up**

Range: 3 to 10

Mean: 6

**Combined**

Range: 8 to 20

Mean: 13

### III. Results/ Provider Questionnaire

Provider Questionnaire  
ACOEM Treatment Guidelines Study

Please indicate the response that best represents your opinion of the patient evaluation forms **developed for this project:**

	<b>Strongly agree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Somewhat disagree</b>	<b>Strongly disagree</b>
1. The History section was complete and did not require me to add more than 1-2 sentences.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
2. The Physical exam section was complete and did not require me to add more than 1-2 sentences.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
3. The Treatment section was complete and did not require me to add more than 1-2 sentences.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
4. The definition of all terms was clear.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
5. The form contained too many items that I never address in a routine patient exam.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
6. The forms were missing significant information.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
7. Using the form helped me provide care consistent with the guidelines.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
8. The form followed my normal pattern for a patient exam.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
9. The format of circle completion was easy to complete.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
10. The layout of the form was not confusing.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
11. There is sufficient open space on the form to write in comments.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
12. Using the form(s) saved time in my exam.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
13. The forms were too long.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
14. The forms created extra paperwork that would inhibit me from using them in the future.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
15. I agree with most of the ACOEM guideline recommendations.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
16. My medical practice conforms to the ACOEM guideline recommendations.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
17. Research that focuses on real medical practice would provide useful information to guideline development.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
18. The ACOEM guidelines lead to "cookbook" medicine and do not allow for individualized care.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>

	<b>Strongly agree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Somewhat disagree</b>	<b>Strongly disagree</b>
19. My employer or practice setting strongly supported (or would support) implementing these forms into our practice.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
20. I have sufficient time in my workday to complete all forms required for workers' compensation and medical records.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
21. My salary or reimbursement for services is directly dependent on the number of patients I see per day.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
22. These forms would be acceptable in my institution and to my insurers as a medical record.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
23. The clinical practice needs at my location prevented my completion of these forms on most patients.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
24. The practice setting I work in highly supports research of this type.	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>

#### Objective 4

We will be able to make quite a few recommendations regarding research in occupational medicine. For example if the aim of the research is to evaluate the presence or absence of physician provided patient education, a chart review is unlikely to reliably determine the answer. We also found that variables for diagnosis established by the ACOEM guidelines are stringent and do not allow the researcher to classify many cases. In addition prospective data collection, such as used in our study design requires full cooperation by the institution as well as the physicians involved. This information will be submitted as a paper.

#### Major Challenges

We had not fully anticipated what would become our major challenge: the reluctance of physicians to complete the forms. We had intended that the forms be used as the major portion of the medical record, thus avoiding duplication of the physicians' effort and loss of time. In fact, however, the only clinics that actually utilized the form completed it in addition to their regular clinical records.

Since we developed the forms with the Medical Directors of the clinics, we did not anticipate that the clinics would decide not to use these forms as their major patient record. This most likely occurred because we created forms for only two issues: the low back and wrist. This would require a change in habit of the physicians for those particular cases, which were only a portion of all of the cases they encountered in their clinic. Undoubtedly this was a further deterrent to successfully obtaining the information we desired.

The largest problem was change in ownership of clients. One clinic in California was sold at the beginning of the project and dropped out immediately. Following the development of the form, the Michigan site was sold. Internal management goals also interfered with the grant. The problems at one site included an increasing workload for the physicians and the fact that the clinics began developing their own required forms, not parallel to ours, at the same time they were supposed to be using our forms. Their

form was developed specifically for their institution and was meant to interact with their dictation system. This made it difficult for their physicians to maintain interest in completing our forms. In every clinical situation requiring that our form be completed in addition to their own, the impetus for completing our forms seemed minimal.

Several barriers to physician form completion were identified and are noted in Table III under Objective 3, Question 1, which contains the results of the physician survey. Physicians seemed uncomfortable with the length of the form, even though they were required to complete very few elements on the form. We did not find any solution to this problem since almost all of the variables were necessary to assess compliance with the ACOEM guidelines or were requested by the clinics to form a complete medical record document.

### **Dissemination Activities**

The project included physician training regarding the use the data scan-able forms. This was completed during the first half of the project. The training took place in Michigan at faculty meetings and at faculty staff meetings at Denver Health & Hospitals.

In addition, a new site was added in Texas. The same materials were provided to these physicians. The training of their staff, however, was accomplished through teleconferencing. In conjunction with the Medical Director, Dr. Paul Roundtree, Dr. Mueller organized and executed the first teleconference, which introduced the ACOEM guidelines. The second teleconference explained the proper use of the Tools created under the grant using materials developed previously for training physicians.

Dr. Mueller presented an initial abstract in Boston at the Worker's Compensation Research Group in February 2001. She spoke on the reliability of the data scannable forms vis-a-vis the chart review method for obtaining data. Another presentation of the study results is scheduled to occur at the State-Of-The-Art Conference in Seattle, in October 2001. The American College of Occupational & Environmental Medicine sponsors this annual conference. The conference is normally attended by between 250 and 400 physicians.

As soon as the data-scannable tool is completely updated it will be available for public use. This will be communicated through Clinical Care Update, a newsletter sent to all members of the National Association of Occupational Health Professionals and through ACOEM publications. The form may also be presented at the spring AOHC (American Occupation Health Conference) that includes occupational health nurses.

### **Major Accomplishments**

We have created a form, which can be used prospectively or retrospectively, to measure compliance of medical care with many aspects of the ACOEM guidelines. The complex variable measurements we have created will be useful in quality improvement studies and in health services research. During the course of the study we identified many important factors that researchers should consider when evaluating care in Occupational medicine. The following are examples:

- 1) We found that the dates of disability (return to modified or full duty or time off work) were not consistently recorded prospectively by the physicians or retrospectively the chart reviewer. Clerks should record these dates directly from the return to work sheets given to the patient.
- 2) Most physicians do not use the technically correct definition for a "positive straight leg raise" exam. This must be emphasized in our instructions and also in physician education generally.

3) When the strict definitions in the Guidelines are used to define diagnoses, many cases will have no diagnosis or the diagnosis will disagree with the physician's. The solution to this should involve both a review of the ACOEM guideline definitions and of general physician education on diagnostic criteria. In addition to specific problems in occupational medicine research we will also report problems we identified recruiting clinics for this type of research.