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Results of the E-Code Quality Improvement Project, Phase II, 2012¹.

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Introduction

Since 2010, the Montana Hospital Discharge Data System (MHDDS) has been collaborating with the Quality Assurance Division of the Montana Department of Public Health and Human Services and the Montana Hospital Association (MHA) to assess the completeness of external cause of injury coding (E-coding), identify barriers to more complete E-coding, and make recommendations for improvement.² Phase I of the project included a survey distributed to 55 of Montana's primary care hospitals, including 44 critical access hospitals (CAHs). We described the results of that survey in detail in a previous report.³ A key finding was that coders reported that lack of detail in the medical records available to them limited the number of E-codes they could assign. Based on those results, phase II of the project involved hiring a medical coder to travel to several of Montana's CAHs to independently code a sample of injury records.

Methods

Montana CAHs are divided into five peer groups based on the average monthly inpatient, outpatient, and emergency department utilization. Peer Group 5 (the smallest hospitals) reported no injury discharges in 2010, so six hospitals were selected from the four remaining groups. At least one hospital from each peer group agreed to participate; three hospitals from Peer Group 1 participated.⁴ Each hospital was asked to provide access to a random sample of medical records for three injury admissions per month throughout the year to take into account seasonality of injury causes, with a goal of 36 injury charts per hospital from 2010. One hospital upgraded to electronic medical records in April of 2011; to minimize the burden on their medical records department, a sample of four records was drawn from each of the eight months after the upgrade (n = 32). Some hospitals had fewer than 36 injury discharges in 2010, so they were asked to include 2009 as well. The two smallest participating hospitals had fewer than the target number of discharges for 2009 and 2010, but we did not ask them to retrieve older records.

We hired an independent certified medical coder to review the medical records and assign E-codes for manner/mechanism and up to two of the following: place of occurrence, intent, and the involvement of alcohol or drugs. She also included activity codes for admissions from 2010 and 2011. Because activity codes were

¹ The Montana Hospital Discharge Data system (MHDDS) receives annual de-identified hospital discharge data set through a Memorandum of Agreement with the Montana Hospital Association and The Montana State Hospital at Warm Springs. Most hospitals in Montana participate in voluntary reporting of discharge data from their Uniform Billing Forms, version 2004 (UB-04). The MHDDS receives information on more than 95% of the inpatient admissions in the state.

² Grant number H54RH00046 from Health Resources and Services Administration, Office of Rural Health Policy, DHHS; Medicare Rural Hospital Flexibility Grant

³ Montana Hospital Discharge Data System Surveillance Report, July, 2011: *Results of the E-Code Quality Improvement Survey, 2011*. Available at <http://www.dphhs.mt.gov/publichealth/epidemiology/mthdds/index.shtml>

⁴ We are grateful to the administration and staff of the participating hospitals, especially in the medical records offices, who made our coder welcome and offered her their assistance.

introduced in October, 2009, admissions from 2009 were not coded for activity. She coded a total of 151 records from the six participating hospitals.

For each injury hospitalization, the coder recorded dates of admission and discharge, sex and age of the patient, and diagnosis codes. She did not record any patient identifiers. These items plus hospital name were used to link records to the unidentified files the MHDDS receives from the MHA. Our coder also transcribed the notes from the medical records that she used to determine the primary and secondary diagnoses and the E-codes. She recorded up to three E-codes (manner/mechanism, place of occurrence, activity, intent, involvement of alcohol or drugs) when information was available, using the *International Classification of Diseases, 9th Revision, Clinical Modification 6th Edition (Hospital Edition)*⁵ and <http://www.findacode.com>, an on-line version of ICD-9-CM/H, to assign codes to both injury diagnoses and E-codes.

We were able to match 97 unduplicated cases of initial injury admission. Three readmissions for prior injury were excluded from this analysis because they lacked E-codes in the MHDDS file and medical record notes were limited to comments such as “readmission for pain management of previous injury.” We compared the file provided to MHDDS by the MHA to the file created by our coder. We tabulated discrepant cases in which our coder was able to assign E-code elements but corresponding codes were not present in the MHDDS file; if a case in the MHDDS file included three E-codes and had different elements recorded (e.g., mechanism, intent, and place of occurrence instead of mechanism, intent, and activity), they were not counted as discrepant. However, only two of 12 records in the MHDDS data set that used all three E-code fields did not correspond to our coder’s assessment. Records from 2009 were not scored for absence of activity codes.

Results

Mechanism of injury, the basic element of the description, was missing in the MHDDS file in 13 of the 97 matched records. This occurred only in records with no E-codes at all in the MHDDS file, although information was present in the medical record to enable our coder to assign one or more E-codes. Only one third of MHDDS records from 2010 and 2011 lacked activity codes, even though this new field was introduced in October, 2009. In contrast, two thirds of the records in the MHDDS file were missing place of occurrence codes in spite of the fact that the information was available in the medical records. Few medical records had explicit comments about intent, leaving the default presumption of unintentional injury. However, there were three cases in which the medical records described assaults and three in which the records described suicide attempts; two assaults and two suicide attempts did not have intent codes in the MHDDS file. Twenty-three medical records included comments about the involvement of alcohol or drugs; these were missing for all matched cases in the MHDDS file.

Table 1. MHDDS Records Missing E-Codes That Could Have Been Assigned Based on Medical Records

	N
Total matched cases	97
MHDDS cases missing place of occurrence	68
MHDDS cases missing activity (2010 and 2011 only)	35
MHDDS cases missing alcohol or drugs	23
MHDDS cases missing mechanism	13
MHDDS cases missing intent	4

⁵ Practice Management Information Corporation, Los Angeles, 2011.

Based on primary diagnosis codes, the distribution of injuries in the matched records was similar to the distribution reported by all CAHs, with the exception that there were no burns in our sample, indicating that the records included in this analysis were generally representative of the kinds of injuries seen by all CAHs in 2009 through 2011 (Table 2). The causes of those injuries were also broadly similar, although there were proportionately more motor vehicle crashes in our sample (Table 3).

Table 2. Types of Injuries Reported by Montana Critical Access Hospitals, 2009-2011

	Matched Records in this Study		All CAH Admissions
	N	%	%
Fracture	53	54.6	62.4
Internal injury	7	7.2	9.0
Burn	0	0	8.8
Contusion and superficial	6	6.2	3.9
Open wound	5	5.2	3.2
Sprain and strain	3	3.1	2.6
Dislocation	1	1.0	1.2
Crushing	2	2.0	0.5
Amputation	1	1.0	0.3
Other and unspecified	19	19.6	16.2

Table 3. Causes of Injuries Reported by Montana Critical Access Hospitals, 2009-2011

	Matched Records in this Study		All CAH Admissions
	N	%	%
Fall	36	43.9	45.3
Poisoning	9	11.0	12.7
Motor vehicle traffic	11	13.4	6.8
Other transport	8	9.8	5.9
Struck by or against	5	6.1	1.9
Natural or environmental	4	4.9	1.2
Overexertion	0	0	1.1
Cut or pierced	3	3.7	0.8
Bicycle	0	0	0.5
Firearm	0	0	0.4
Machinery	0	0	0.4
Burn	0	0	0.5
Other and unspecified	15	15.5	22.6

Discussion

Discrepant coding may have several sources. The first is the completeness of the records available to the coders. Our coder had access to complete medical records, including notes from physicians, nurses, admissions, and discharge. These may not always be available to the medical billing coders who enter the information that will eventually be transmitted to MHDDS. This may be especially true of electronic medical records (EMR) systems, in which employees may only be able to access limited portions of the EMR, depending on their job requirements. In some hospitals, the transition to EMR is still in progress: at one hospital, our coder had access to the EMR as well as nursing, admission, and discharge notes, but the notes were in paper only and did not appear in the EMR. We were not able to determine whether our coder had more complete access to this information than medical billing staff.

A second possible source of discrepant coding is the reference system available. Our coder used both a hard copy of the ICD-9-CM/H manual and the corresponding on-line look-up system. The online system is updated regularly and contains prompts and reminders about inclusion and exclusion criteria. This may enable more precise coding and it may also be quicker and easier to use.

There are also policy and procedure differences among hospitals. One medical records manager commented that they do not use E-codes for patients admitted from the Emergency Department (ED) or via outpatient referral, based on the specification: "Assign the appropriate E code for the initial encounter of an injury, poisoning, or adverse effect of drugs, *not for subsequent treatment.*"⁶ Outpatient and ED visits are not linked to admissions in the MHDDS, although our coder had access to complete medical records and was able to assign E-codes to patients admitted from EDs or via outpatient referral.

The transition to ICD-10-CM is approaching. Injury coding will be substantially revised but will be no less important. There will still be codes describing the external causes of injuries (V, W, X and Y codes will replace E-codes), and these will allow more detailed cause coding.⁷ The issues raised here will remain pertinent regardless of the transition.

- Coders cannot assign E-codes if they lack access to the relevant information from patient records. Our small study suggests that there is a great deal of information in many patient records to support E-coding for place of occurrence and activity, key items for public health applications based on MHDDS data.
- The transition to EMR may be a help or a hindrance, depending on how thoroughly consolidated all patient information is and how much access coders have to the entire EMR.
- Our previous survey also found that hospital policy encouraging or requiring E-coding, and billing software with dedicated fields and prompts for E-codes, contributed to more complete coding.

For information about the Montana Hospital Discharge Data System, please contact Cody Custis, MHDDS Epidemiologist, Office of Epidemiology and Scientific Support, (406) 444-6947 or ccustis@mt.gov

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⁶ See Reference 5, page 78.

⁷ http://www.icd10monitor.com/index.php?option=com_content&view=article&id=341%3Aexploring-icd-10-cms-chapter-20-external-causes-of-morbidity&catid=48%3Aicd10-enews&Itemid=106&showall=1

