Getting Better Data from the MDS: Improving Diagnostic Data Reporting in Long-term Care Facilities

by Michelle Dougherty, RHIA, CHP, and Sue Mitchell, RHIA

Reporting diagnoses consistently can be a challenge in nursing homes. Analysis of the MDS by AHIMA suggests future improvements, but there are also ways to improve reporting today.

Consider the following scenario: a patient in a long-term care facility has many diagnoses, including one for diabetic retinopathy. A new staff member is completing the minimum data set (MDS) and must fill out section I on disease diagnoses for the patient. She asks advice from three colleagues and receives three different answers: (1) she could check the box in section I1 for diabetes mellitus; (2) she could report the code number in I3, since her 1998 MDS user's manual indicates the check box for diabetes mellitus relates to code 250.00; or (3) she could check the box for diabetes mellitus and report the more specific diagnosis code for diabetic retinopathy in section I3. What's an assessor to do?

An important part of ensuring data quality is identifying and addressing the pitfalls assessors encounter that degrade the consistency and integrity of data. The scenario above illustrates one of the challenges to reporting diagnostic information in a nursing home—all three options are used, resulting in data that can't be trusted as completely accurate. Fortunately, we know the problems and can apply tactics to improve quality of MDS diagnostic data.

The MDS

The MDS has been used as a standardized assessment and data collection tool in US long-term care facilities since the early 1990s. The Centers for Medicare and Medicaid Services (CMS) maintains and updates the MDS. Currently version 2 (MDS2.0) is in use, and CMS is working on the third iteration, MDS3.0.

In the past decade MDS data has been used in an increasing number of long-term care programs:

- **RAPs**. MDS was originally implemented as an assessment tool along with a series of resident assessment protocols (RAPs) to assist in patient evaluation and care planning.
- **RUGs**. In 1998 a prospective payment system was implemented based on a case mix methodology known as resource utilization groups (RUGs). Scores on the MDS determine the RUGs reimbursement rates.
- **QIs**. In 1999 quality indicators (QIs) derived from the MDS were implemented and tied to the survey process.
- **QMs**. Beginning in 2002 MDS data has been used to generate publicly reported quality measures (QMs) for the Nursing Home Quality Initiative.

Diagnostic data informs each of these programs (see the table below for a breakdown). It is critical that diagnosis information be reported in an accurate and consistent manner, not only for proper assessment and care planning but also for compliance with survey and payment rules.

Section I Items Used in Long-term Care Programs

Program	Section I Items
RUGs/PPS	I1a, I1r, I1s, I1v, I1w, I1z, I2e, I2g
QIs	I1ff, I1gg, I3

QMs	I1x, I1z, I2e, I2f, I2g, I2j, I2k, I2l, I3
RAPs	I1i, I1j, I1ee, I1jj, I1ll, I3

Section I collects data in three categories, requiring the assessor to check boxes on conditions that apply:

- Section I1 collects categories of diagnoses.
- Section I2 collects categories of infections.
- Section I3 allows for entry of other diagnosis descriptions and the related ICD-9-CM code.

The section I form is shown in "MDS2.0, Section I" below.

SECTION I DISEASE DIAGNOSES

Check only those diseases that have a relationship to current ADL status, cognitive status, mood and behavior status, medical treatments, nursing monitoring, or risk of death. (Do not list inactive diagnoses)

1. DISEASES (*If none apply, CHECK the NONE OF ABOVE box*)

ENDOCRINE/METABOLIC/ NUTRITIONAL		Hemiplegia/Hemiparesis	v.
Diabetes mellitus	a.	Multiple sclerosis	w.
Hyperthyroidism	b.	Paraplegia	x.
Hypothyroidism	c.	Parkinson's disease	y.
HEART/CIRCULATION		Quadriplegia	z.
Arteriosclerotic heart disease (ASHD)	d.	Seizure disorder	aa.
Cardiac dysrhythmias	e.	Transient ischemic attack (TIA)	bb.
Congestive heart failure	f.	Traumatic brain injury	cc.
Deep vein thrombosis	g.	**PSYCHIATRIC/MOOD**	
Hypertension	h.	Anxiety disorder	dd.
Hypotension	i.	Depression	ee.
Peripheral vascular disease	j.	Manic depression (bipolar disease)	ff.
Other cardiovascular disease	k.	Schizophrenia	gg.
MUSCULOSKELETAL		**PULMONARY**	
Arthritis	l.	Asthma	hh.
Hip fracture	m.	Emphysema/COPD	ii.
Missing limb (e.g., amputation)	n.	**SENSORY**	
Osteoporosis	o.	Cataracts	jj.
Pathological bone fracture	p.	Diabetic retinopathy	kk.
NEUROLOGICAL		Glaucoma	ll.
Alzheimer's disease	q.	Macular degeneration	mm.
Aphasia	r.	**OTHER**	
Cerebral palsy	s.	Allergies	nn.
Cerebrovascular accident (stroke)	t.	Anemia	oo.
Dementia other than Alzheimer's disease	u.	Cancer	pp.
		Renal failure	qq.
		NONE OF ABOVE	rr.

2. INFECTIONS (*If none apply, CHECK the NONE OF ABOVE box*)

Antibiotic resistant infection (e.g., Methicillin resistant staph)	a.	Septicemia	g.
Clostridium difficile (c. diff.)	b.	Sexually transmitted diseases	h.
Conjunctivitis	c.	Tuberculosis	i.
HIV infection	d.	Urinary tract infection **in last 30 days**	j.
Pneumonia	e.	Viral hepatitis	k.
Respiratory infection	f.	Wound infection	l.
		NONE OF ABOVE	m.

3. OTHER CURRENT OR MORE DETAILED DIAGNOSES AND ICD-9 CODES

a. _____ . | | | | . | |
b. _____ . | | | | . | |
c. _____ . | | | | . | |
d. _____ . | | | | . | |
e. _____ . | | | | . | |

As CMS undertook the development of MDS3.0, it requested input from multiple stakeholder groups and professional organizations. At the end of 2002 CMS contacted AHIMA to request assistance with revising section I for the next version, MDS3.0. The key goals were to improve accuracy of the data collected and to eliminate any unnecessary items in the section.

Identifying Data Quality Issues

In the seven years since its introduction, anecdotal evidence has shown inconsistencies in the capture of diagnosis information using MDS2.0. User misinterpretation of the instructions in section I include the following misconceptions:

- Diagnoses could only be checked if the diagnosis had a code that corresponded to a listing of related code numbers found in the MDS user's manual.
- Diagnoses were only coded if a check box did not exist for the diagnosis.
- A diagnosis could only be reported by either a check box or a code number because clarifying a check box diagnosis with a code number would skew counts of the frequency of a diagnosis.

Other factors contributing to inconsistency in section I reporting include:

- Listings of diagnosis codes found in the MDS user's manual had not been revised to reflect changes from the annual update of ICD-9-CM codes.
- Users reported resolved diagnoses.
- Users reported diagnoses without physician documentation of the condition in the clinical record.

In July 2004 CMS published findings from the contracted Data Assessment and Validation project (DAVE). One of DAVE's primary objectives is to assess the accuracy and reliability of MDS data and support improvements. The project analyzed MDS items in various states and identified section I as having the second highest discrepancy rate. The largest number of discrepancies were found in the following check boxes:

- I1nn, Allergies
- I2j, Urinary tract infection
- I1l, Arthritis
- I1oo, Anemia
- I1k, Other cardiovascular disease

Common discrepancies were:

- Allergies that were well documented in the medical record or on hospital history and physicals were omitted on the MDS for coding. Additionally, assessors were not clear on the definition of allergies as given in the MDS manual.
- Assessors included diagnoses in section I when they were resolved or no longer had a relationship to the resident's current ADL status, cognitive status, mood or behavior status, medical treatments, nursing monitoring, or risk of death. This was usually attributed to vendor software packages that did not allow the removal of past diagnoses.
- Diagnoses reported in section I did not have supporting physician documentation in the medical record.
- Assessors did not use the 30-day look back for urinary tract infections.
- Urinary tract infections were coded and treated based on physician's working diagnosis without a pending urine culture.

AHIMA's Analysis and Recommendations

During the first quarter of 2003 AHIMA convened a panel to provide input to CMS on refining the collection of diagnoses and helping address the data quality issues. The panel determined that an important first step would be to identify the possible formats for collection of the data, including the pros and cons of each method. The panel identified three possible methods for collecting diagnosis information:

1. Capturing only the diagnostic statement and ICD-9-CM code number, eliminating all diagnosis check boxes
2. Collecting diagnoses only by check box, eliminating the coding of diagnoses
3. Continue collecting diagnoses by a combination of check boxes and diagnostic statements with ICD-9-CM code number, but implement refinements such as:

    - Address problem areas such as outdated coding reference lists in the MDS user's manual and unclear instructions for capturing diagnosis information
    - Revise instructions to require diagnoses be coded only in instances where a check box was not available to record the diagnosis
    - Continue to collect diagnostic information by check boxes but require ICD-9-CM codes for all diagnoses

The panel felt there were good arguments for the first option—eliminating the check boxes and implementing a process for collecting only the diagnosis statement and code number. It recognized the value of improved specificity of diagnostic information, improved coordination of clinical and billing diagnosis information, uniformity with other post-acute data sets, and elimination of the confusion caused by ambiguity of check boxes. However, the panel was also well aware that the long-term care community would view such a change as a significant burden and that providers would raise work force issues as barriers to effective implementation, such as inadequately trained personnel and increased time required to assign code numbers.

As for the second option, the panel recognized that relying solely on check boxes for collection of diagnosis information would not be a viable alternative. The method would impose severe limits on the range and specificity of diagnosis information

captured.

The panel thus concluded that the existing process of capturing diagnoses by a combination of check boxes and code numbers would have to be continued, with modifications that propel the long-term care community forward in efficient and effective use of ICD-9-CM coding, preferably through use of an encoder or drop-down boxes.

The AHIMA panel began analysis of section I data with the goal of identifying diagnosis check boxes that could be eliminated due to low use and then populating drop-down boxes with ICD-9-CM code numbers to facilitate coding and improve accuracy of diagnostic data. Results are shown in "Analysis of Section I" at the end of this article. The final draft is shown below (and may also be found online at www.cms.hhs.gov/quality/mds30/DraftMDS30.pdf).

Draft MDS3.0, Section I (April 2, 2003)

SECTION I. DISEASE DIAGNOSES

1. DISEASES MDS 3.0 proposed changes (AHIMA)	Endocrine / metabolic / nutritional ✔	Code	Neurological ✔	Code
	a. ▼Diabetes mellitus a.		v. Alzheimer's Disease v.	
	b. ▼Nutritional deficiency b.		w. ▼Aphasia w.	
	c. ▼Thyroid disorder c.		x. ▼Cerebral Palsy x.	
	d. ▼Other metabolic/ immunity disorders d.		y. ▼CVA y.	
	Heart/circulation		z. ▼Hemiplegia z.	
	e. ▼Anemia e.		aa. Huntington's Chorea aa.	
	f. ▼Arteriosclerotic heart disease (ASHD f.		bb. MS bb.	
	g. ▼Cardiac dysrhythmias g.		cc. Paraplegia cc.	
	h. Congestive heart failure h.		dd. ▼Quadriplegia dd.	
	i. ▼Hypertension i.		ee. Seizure Disorder ee.	
	j. ▼Hypotension j.		Ps yc hiatric / mood / mental health	
	k. Peripheral vascular disease k.		ff. ▼Dementia/Organic Psychotic Conditions ff.	
	l. ▼Other cardiovascular disease l.		gg. ▼Anxiety disorder gg.	
	Infection		hh. ▼Depression hh.	
	m. ▼Pneumonia m.		ii. ▼Manic depression ii.	
	n. Acute Respiratory Infection (excludes pneumonia & chronic bronchitis) n.		jj. ▼Other nonorganic psychoses jj.	
	o. ▼Septicemia o.		kk. ▼Paranoid states/ delusional disorders kk.	
	p. ▼Urinary Tract Infection p.		ll. ▼Schizophrenia ll.	
	q. ▼Viral Hepatitis q.		mm. Tourette's Disorders mm.	
	r. Wound infection (post-op) r.		Pulmonary (non-infectious)	
	Musculoskeletal		nn. ▼COPD & Pulmonary Conditions nn.	
	s. ▼Arthritis s.		Sensor y	
	t. Osteoporosis t.		oo. Cataracts oo.	
	u. ▼Fracture u.		pp. Glaucoma pp.	

	2. OTHER CURRENT DIAGNOSES:	
	a.	____.____
	b.	____.____
	c.	____.____
	d.	____.____
	e.	____.____
	f.	____.____
	g.	____.____
	h.	____.____
	i.	____.____
	j.	____.____
	k.	____.____

The Current Status

In early 2003 it appeared that MDS3.0 was on a fast track for implementation. The migration has since slowed as CMS develops a plan to meet Department of Health and Human Services requirements that all new or revised instruments comply with Consolidated Health Informatics (CHI) messaging and vocabulary standards. MDS3.0 content must conform to CHI-endorsed standards including SNOMED CT, Logical Observation Identifier Names and Codes (LOINC), and Health Level Seven terminology using an electronic meta-thesaurus software program. Another major consideration for MDS3.0 is

integration with the EHR. This new vision has unique issues that must be analyzed and addressed, including how diagnoses will be collected and reported (e.g., how diagnoses may be mapped from SNOMED to ICD).

The feedback on AHIMA's recommendations and use of drop-down menus was mixed. Many commenters supported the new level of detail provided in the menus. CMS convened a technical expert panel consisting of physicians, nurses, and other stakeholders to review the draft. The panel felt that the proposed drop-down menus were too complex and would be difficult to code to the fourth and fifth digit given the lack of coding expertise.

Although the AHIMA panel does not fully agree with these comments—nursing homes must submit complete ICD-9-CM codes as required by HIPAA's transaction and code set rule—it continues to extend its support for revisions to MDS3.0 section I. The initiative to link the MDS and EHR has interesting and exciting possibilities for improving accuracy and reporting of diagnostic information in the nursing home setting.

How to Improve Section I Accuracy Today

Improving the accuracy of diagnostic data should not wait for the implementation of MDS3.0. The following are tips for improving data quality in the current version of section I:

- All reported diagnoses must be supported by physician documentation in the medical record.
- A process must be in place to resolve diagnoses and update the clinical information system if it feeds the MDS. Only active diagnoses and those that affect the plan of care should be reported on the MDS. A good technique is to maintain a diagnosis list and review and resolve diagnoses during the assessment and care planning process.
- Keep current on the changes to the MDS manual and specifically to section I instructions. CMS has published manual updates on its Web site for August 2003, April 2004, and June 2004. They can be downloaded at www.cms.hhs.gov/quality/mds20.
- Recognize that the MDS user's manual no longer identifies ICD-9-CM codes for the check box items of I1 and I2. It has replaced the codes with a narrative description of each disease and condition. Assessors must use their judgment and determine if a diagnostic statement meets the description for that check box. If it does, the box should be checked. If there is room in I3, the specific diagnosis code can be reported.
- Individuals who complete section I should be trained in ICD-9-CM coding, with emphasis placed on general and LTC specific coding rules. CMS's Medlearn has a free basic ICD-9-CM coding course online at www.cms.hhs.gov/medlearn. Look for seminars locally or engage a qualified health information professional to provide basic coding training.
- Facilities should have policies in place regarding collecting diagnoses, how they are coded, how they are reported on the MDS, and by whom.
- New code books or updates should be purchased each year and available to staff who complete section I of the MDS. Staff who code should have a copy of the official coding guidelines available on the CDC Web site at www.cdc.gov.
- Diagnosis databases in clinical information systems must be updated to reflect codes added, revised, and discontinued through the annual ICD-9-CM updates. A process should be in place to update the code numbers for a patient if an existing code number has changed.

As HIM professionals we understand the importance of data quality and can champion improving the integrity and reliability of data in section I and in all areas of the MDS. CMS's vision for linking the EHR and MDS opens new doors for HIM professionals in long-term care. To be ready, it is important to monitor and obtain training in new areas such as e-HIM™, SNOMED, and other EHR standards. An exciting time awaits.

Analysis of Section I

To identify check-box responses with low use, the AHIMA panel analyzed data compiled primarily from the MDS Active Resident Information report posted on CMS's Web site (see www.cmshhs.gov/states/mdsreports). The report provides the national percentage of I1 and I2 responses for residents active as of December 31, 2002.

Review of the data found:

- Of the 43 diagnoses and conditions listed in I1:
    - 21 items reported a frequency of 10 percent or higher.
    - 14 items are required for use in RAPs, RUGs, QIs, or QMs.
    - Of the items required for RAPs, RUGs, QIs, or QMs, only five were reported with a frequency of 10 percent or higher.
- Of the 13 diagnoses and conditions listed in I2:
    - None had a frequency of 10 percent or higher.
    - Seven of the items had a frequency so low that it was not reported.
    - Six of the items are required for RAPs, RUGs, QIs, or QMs.
    - Of the items required for RAPs, RUGs, QIs, or QMs, three have a frequency so low that it was not reported.

The frequency of each item from question I1 and I2 is detailed in the table "Diagnosis Check-Box Responses for Sections I1 and I2, 2002" shown opposite.

To rank use of individual ICD-9-CM codes in section I3, the panel analyzed data compiled from a CMS spreadsheet of codes submitted for a one-year period.

Analysis of ICD-9-CM codes in question I3 revealed the following:

- 18,896 different ICD-9-CM codes were used to report 4,231,148 diagnoses in I3.
- 1,437 ICD-9-CM codes were reported 250 times or more.
    - The top 1,437 ICD-9-CM codes represented 92 percent of all diagnoses reported in I3.
    - Of the top 1,427 ICD-9-CM codes, 91 percent were valid code numbers and 9 percent were invalid codes (i.e., category codes or not coded to the highest level of specificity).
    - There were 80,753 occurrences of CVA codes, with code "436" used 42 percent of the occurrences and "438.xx" codes used in 58 percent of the occurrences.
    - There were 154,140 occurrences of fracture codes, with codes 802–829 used in 89 percent of the occurrences and codes V54.xx used in 11 percent of occurrences.

The 20 most frequent codes reported in I3 in 2002 are as follows:

Code Number	Frequency	Description
530.81		
401.9	102,594	Esophageal reflux
787.2	83,071	Hypertension
427.31	78,721	Dysphagia
715.90	67,854	Atrial fibrillation
298.9	58,271	Osteoarthritis, site unspecified
428.0	55,868	Unspecified psychosis
331.0	49,993	Congestive heart failure
781.2	47,610	Alzheimer's disease
272.4	42,299	Abnormality of gait
593.9	41,308	Hyperlipidemia, other/unspecified
290.0	37,666	Disorder kidney/ureter unspecified (renal disease)
294.8	36,373	Senile dementia, uncomplicated
311	36,276	Other organic brain syndrome (chronic)
799.3	36,175	Depressive disorder
496	34,248	Debility, unspecified
250.00	33,765	COPD
436	32,346	Diabetes, w/o complication, type II
780.79	32,054	Acute CVA

707.0	31,584	Other malaise and fatigue
780.9	31,159	Decubitus ulcer
	30,549	Other general symptoms

Diagnosis Check-Box Responses for Sections I1 and I2, Fourth Quarter 2002 *Items in red required for RAPs, RUGs, QIs, and QMs*

Item	% of Total Responses
Endocrine/Metabolic/Nutritional	
1a: Diabetes mellitus	25.2
1b: Hyperthyroidism	0.7
1c: Hypothyroidism	16.1
Heart/Circulation	
1d: Arteriosclerotic heart disease	12.9
1e: Cardiac dysrhythmias	13.2
1f: Congestive heart failure	21.8
1g: Deep vein thrombosis	2.1
1h: Hypertension	55.9
1i: Hypotension	1.2
1j: Peripheral vascular disease	11.1
1k: Other cardiovascular disease	19.4
Musculoskeletal	
1l: Arthritis	30.2
1m: Hip fracture	5.5
1n: Missing limb (e.g., amputation)	2.6
1o: Osteoporosis	18.0
1p: Pathological bone fracture	*
Neurological	
1q: Alzheimer's disease	17.1
1r: Aphasia	5.1
1s: Cerebral palsy	0.9
1t: Cerebrovascular accident	22.6
1u: Dementia other than Alzheimer's disease	36.9
1v: Hemiplegia/hemiparesis	10.3
1w: Multiple sclerosis	1.2
1x: Paraplegia	0.7
1y: Parkinson's disease	6.9
1z: Quadriplegia	0.9
1aa: Seizure disorder	9.9
1bb: Transient Ischemic attack	3.7
1cc: Traumatic brain injury	0.8
Psychiatric/Mood	
1dd: Anxiety disorder	13.0
1ee: Depression	39.6
1ff: Manic depression (bipolar disease)	2.4
1gg: Schizophrenia	5.2

Pulmonary 1hh: Asthma 1ii: Emphysema/COPD	 2.6 15.4
Sensory 1jj: Cataracts 1kk: Diabetic retinopathy 1ll: Glaucoma 1mm: Macular degeneration	 10.1 0.9 7.6 4.7
Other 1nn: Allergies 1oo: Anemia 1pp: Cancer 1qq: Renal failure 1rr: None of above	 25.4 22.3 7.2 5.2 not reported
2a: Antibiotic resistant infection (e.g., methicillin resistant staph) 2b: Clostridium difficile 2c: Conjunctivitis 2d: HIV infection 2e: Pneumonia 2f: Respiratory infection 2g: Septicemia 2h: Sexually transmitted diseases 2i: Tuberculosis 2j: UTI in last 30 days 2k: Viral hepatitis 2l: Wound infection 2m: None of above	 1.8 not reported not reported not reported 3.9 not reported 0.7 not reported 0.1 9.4 not reported not reported not reported

Sample size ranges from approximately 1,429,000 (items listed on all assessment types) to 1,394,500 (items excluded from quarterly assessment forms), except as indicated. *Fewer than 10 responses. Source: CMS.

References

Centers for Medicare and Medicaid Services. "December 2002 Revised Long Term Care Resident Assessment Instrument User's Manual for the Minimum Data Set (MDS) Version 2.0." Available online at www.cms.hhs.gov/quality/mds20.

Centers for Medicare and Medicaid Services. "MDS 3.0 Town Hall Meeting Conference Call." Transcript and PowerPoint presentation, ID #244453. June 2, 2003. Available online at www.cms.hhs.gov/quality/mds30/Transcript.pdf.

Michelle Dougherty *(michelle.dougherty@ahima.org) is an HIM practice manager at AHIMA.*
Sue Mitchell *(smitchell@hcr-manorcare.com) is corporate manager of HIM services for HCR Manor Care in Toledo, OH.*

Article citation:
Dougherty, Michelle, and Sue Mitchell. "Getting Better Data from the MDS: Improving Diagnostic Data Reporting in Long-term Care Facilities." *Journal of AHIMA* 75, no.10 (Nov-Dec 2004): 28-33.