U.S. Department of Health and Human Services
Assistant Secretary for Planning and Evaluation
Office of Disability, Aging and Long-Term Care Policy

TAXONOMY OF HEALTH INFORMATION TECHNOLOGY FUNCTIONS IN NURSING HOMES

REPORT B: REVIEW BY REPRESENTATIVES FROM NURSING HOMES AND VENDORS

August 2007

Office of the Assistant Secretary for Planning and Evaluation

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This report was prepared under contract #HHS-100-03-0028 between HHS's ASPE/DALTCP and the University of Colorado. For additional information about this subject, you can visit the DALTCP home page at http://aspe.hhs.gov/_/office_specific/daltcp.cfm or contact the ASPE Project Officer, Jennie Harvell, at HHS/ASPE/DALTCP, Room 424E, H.H. Humphrey Building, 200 Independence Avenue, S.W., Washington, D.C. 20201. Her e-mail address is: Jennie.Harvell@hhs.gov.

TAXONOMY OF HEALTH INFORMATION TECHNOLOGY FUNCTIONS IN NURSING HOMES
Report B: Review of Representatives from Nursing Homes and Vendors

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August 6, 2007

Prepared for
Office of Disability, Aging and Long-Term Care Policy
Office of the Assistant Secretary for Planning and Evaluation
U.S. Department of Health and Human Services
Contract #HHS-100-03-0028

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I. PURPOSE

This is the second report in a series that is describing the findings from stakeholders. The background on the taxonomy development is described in more detail in Report A and it is the expectation of the authors that these reports would be read as a set. A select group of nursing home (NH) providers was invited to provide feedback on the draft taxonomy and information on which applications are currently in use (or planned for future implementation) and the extent to which they are used. This report provides a summary of the findings from this review.

II. METHODS

Taxonomy Adaptations: Based on comments received from representatives from standards development organizations (SDOs) (see Report A), the taxonomy was revised. It was then disseminated to home health and NH health information technology (HIT) vendors for their review and comments. The taxonomy was modified to reflect the vendor comments and revisions. The next step was to further modify the taxonomy to capture what HIT applications/features were being used in NHs and for them to identify the extent of use. This version became known as the “nursing home provider taxonomy” and can be found in Attachment A. Columns noting related standards and other “frequently packaged with” applications that existed in earlier versions of the taxonomy (for SDOs and vendors) were replaced with the following columns to allow the providers to specify for each application:

1. the name of the supporting product;
2. the name(s) of other products supporting interfacing applications;
3. current or planned usage;
4. types of employees using the application; and
5. the extent to which the product had been implemented in the NH.

Scales were developed for two of the columns. For current/planned usage (#3 above) the scale ranged from "1-We have this application and are currently using it," to "5-We do not have this application and have no desire to obtain it." For the extent of application implementation (#5 above), the scale ranged from "1-The application is fully implemented and all applicable staff are using it," to "5-This application has been purchased but we do not plan to use it at this time." As mentioned previously, a copy of the adapted taxonomy and answer key containing the scales can be found in Attachment A.

NH providers: Potential representatives from NHs were identified through software vendor recommendations or based on previous contacts and relationships with project staff and/or the ASPE project officer. In selecting the nine NH provider representatives, we attempted to include a variety of ownership (profit vs. nonprofit), geographical

locations, and vendor products. The following NH providers were invited to participate in one of two conference calls that provided information on what was expected of them should they agree to provide us with information about their health care setting:

1.	Kena Dubberly	Garrison Geriatric Care Center, Lubbock, TX
2.	Russell J. Williams	AG Rhodes Homes, Atlanta, GA
3.	Gary Kelso	Mission Health Services Hillside Rehabilitation Center, Huntsville, UT
4.	Bill Krantz	Benedictine, Cambridge, MN
5.	Mark Pavlovich	Sava SeniorCare, Atlanta, GA
6.	Bill Kubat	Lutheran Good Samaritan, Sioux Falls, SD
7.	Terri Martell	Home Quality Management, Palm Beach Gardens, FL
8.	Sunni Herman	Gurwin Jewish Geriatric Center, Commack, NY
9.	Daniel H. Wilt	Erickson Communities, Baltimore, MD

Providers participated in conference calls according to their preferred date and time. During the calls, the purpose of the project and the draft taxonomy were reviewed. Participants were asked to complete the columns in the adapted taxonomy and submit their input within one to two weeks.

III. RESULTS

Five of the NH providers submitted feedback on their use of HIT. NH providers listed from one to 24 unique products in use by facility staff. In the case of a NH providing conflicting information on an application (e.g., stating they have a product they are using to support the application and also stating that they plan to purchase the application within the next 12-24 months), we interpreted the finding to mean that the NH provider did have the functionality in question. Data on use of specific applications were synthesized and findings summarized by taxonomy domain.

Administration: Four of the five responding NH providers indicate that they are currently using automated systems for most of the functions listed under the administration domain. However, only one NH reports the use of software for contracts management and only three are using applications to track claims denials. Interestingly, one NH reports that they do not use an automated payroll feature; the same NH uses a single HIT product.

Operations Management: Table 1 summarizes the data from the five respondents for the applications in this domain, tallying the number of providers reporting that: (a) they own and use a product that supports the application; or (b) that they own a product supporting the application but are not currently using it. Only two operations management applications are in use by all five facilities: registration and MDS data management (i.e., software for data entry, editing, and transmission to data repositories). None of the NH providers use software for electronic receipt of referral

data (e.g., e-Discharge or E-CIN), and only two facilities have systems for assigning patient acuity and for staffing and scheduling. Four of the five use an automated staff time/attendance system, and three use personnel management systems (e.g., tracks hire dates, in-service attendance, credentials/licenses). Consistent with the number of providers reporting use of administrative functions, four are able to generate financial management reports. Two use workflow management systems and another has some functionality but is not currently using it. Two facilities have products supporting facilities/materials management, three have systems for dietary management, and four have pharmacy management tools. However, none of the facilities are tracking/managing medications for billing using an automated system.

Four of the five nursing facilities report some automated quality management tools, and all four are able to generate risk audit reports, "dashboard" reports of key quality indicators, and reports of occupancy rates ant trends. Two or three providers note the functionality to produce other types of quality reports. However, only two have the functionality to electronically report population health data and notify public health agencies for reportable conditions (e.g., tuberculosis). Electronic access to clinical guidance is available at two NH providers, although another site reports that they have the functionality but are not currently using it. Only one facility can provide de-identified health data and one allows care providers access to an online policy and procedure database.

TABLE 1: Tally of NH Responses for Operations Management Domain Applications

	Operations Management Domain Application Features	Own/Use	Own/Don't Use
B.1	Registration	5/5	
B.2	Online access for referrals		1/5
B.3	Acuity assignment	2/5	1/5
B.4	Staffing/scheduling	2/5	
B.5	Staff time/attendance tracking	4/5	
B.6	Personnel management	3/5	
B.7	Workflow management	2/5	1/5
B.8	User-defined financial management reports	4/5	
B.9	Facilities/materials management	2/5	
B.10	Dietary management	3/5	
B.11	Pharmacy management	4/5	
B.12	Medications tracking/billing	-	-
B.13	MDS data management (i.e., entry, editing, transmission)	5/5	
B.14	Quality management activities and reporting	4/5	
B.14.a	Incident reporting	2/5	
B.14.b	Tracking of adverse occurrences (e.g., falls, med errors)	3/5	
B.14.c	Tracking of infections	3/5	
B.14.d	Calculation of outcomes from MDS data (e.g., hospitalization)	2/5	
B.14.e	Risk audits for quality areas of concern for surveyors (e.g., wounds)	4/5	
B.14.f	"Dashboard Reports" of key quality indicators (e.g., hospitalizations, infections and falls)	4/5	
B.14.g	Occupancy rates and trends	4/5	
B.15	Reporting and population health management	2/5	
B.16	Electronic access to clinical guidance	2/5	1/5
B.17	De-identified data request management	1/5	
B.18	Policy/procedure database	1/5	

Electronic Health Record: Given the methods used for identifying the NH provider participants (described in the Methods section above), we anticipated that all participating facilities would be using an electronic health record (EHR). However, only four of the five report using an EHR. One reports some EHR functionalities (e.g., the

ability to electronically produce summary reports), but not an electronic record that allowed the capture and reporting of assessment data or visit notes. For each application within the domain of the EHR, Table 2 provides a summary of the provider data.

TABLE 2: Tally of NH Responses for Electronic Health Record (EHR) Domain Applications

EHR Application Features		Own/Use	Own/Don't Use
C.1	Maintain patient record/health information capture, management, and review	4/5	1/5
C.2	Patient consent, authorizations and directives	2/5	1/5
C.3	Comprehensive initial and follow-up assessments and patient-originated data	4/5	
C.4	Summary reports	5/5	
C.5	Clinical notes	4/5	
C.5.a	Physician	3/5	1/5
C.5.b	Pharmacy/pharmacist	2/5	1/5
C.5.c	Registered Nurse (RN)/Licensed Practical Nurse (LPN)	4/5	
C.5.d	Physical Therapist (PT)	3/5	1/5
C.5.e	Occupational Therapist (OT)	4/5	
C.5.f	SLT	4/5	
C.5.g	Social Worker (SW)	4/5	
C.5.h	Dietician	4/5	
C.5.i	Clergy	3/5	
C.5.j	Aide/attendant	4/5	1/5
C.5.k	Therapy aide	3/5	1/5
C.5.l	Volunteers	1/5	
C.6	Receive external clinical documents	2/5	1/5
C.6.a	Laboratory data	3/5	1/5
C.6.b	Radiology data	2/5	1/5
C.6.c	Patient consults	2/5	1/5
C.6.d	Patient history/EHR from other settings	2/5	1/5
C.7	Problem list	3/5	1/5
C.8	Care planning/goal setting	3/5	1/5
C.8.a	Single interdisciplinary plan of care	3/5	1/5
C.8.b	Acute problem plan of care/single plan of care	2/5	1/5
C.8.c	Discipline-specific (e.g., therapy) plan of care	3/5	1/5
C.9	Decision-support	3/5	1/5
C.9.a	Electronic clinical pathways/standardized care plans	2/5	1/5
C.9.b	Disease management programs	2/5	1/5
C.9.c	Automated alerts for lab draws (when due)	1/5	1/5
C.9.d	Automated prompts for unusual events (e.g., medication errors, etc.)	2/5	1/5
C.9.e	Automated prompts for preventive practices (e.g., immunizations)	1/5	1/5
C.9.f	Decision-support for e-prescribing. May include dosing; drug selection; drug-to-drug interactions; drug-to-food interactions.	2/5	1/5
C.9.g	Risk assessment tools (e.g., dehydration risk, contracture risk, falls risk, pressure ulcer risk, etc.)	3/5	1/5
C.9.h	Results management	2/5	1/5
C.9.i	Alerts for SOM/F-tag compliance	-	-
C.10	Care plan monitoring	3/5	1/5
C.11	Trending	2/5	1/5
C.12	Secure electronic messaging	1/5	1/5
C.12.a	Intra-facility	1/5	1/5
C.12.b	Extra-facility (with medical doctor (MD), pharmacy, pharmacy consultant, laboratory, etc.)	2/5	
C.12.c	Health information exchange with patients and caregivers		1/5
C.13	Patient education	1/5	
C.14	Security/privacy	4/5	1/5
C.15	Physician and/or pharmacist access to EHR	2/5	1/5
C.16	Computerized provider order entry (CPOE)	3/5	1/5

Four NH providers report having an EHR that allows them to maintain the health record, record the initial and follow-up patient assessments, record and produce clinical notes for some or all of the disciplines listed, and produce summary reports. One multi-facility provider notes that two of its five facilities are beginning to implement some EHR

functionality for clinical notes using a home-grown system. Only two providers report having the functionality to capture patient consent/authorizations and directives within the EHR. The ability to electronically receive external clinical documents is in use at two facilities (three for laboratory data) and one facility has the functionality but currently is not using it. Three NH providers note having the EHR applications to generate problem lists and plans of care, while another notes that they have the software for these functions but currently are not using it.

Some type of decision-support software is in use by three providers. A fourth has some of the functionality but has not yet trained its staff. All three report having some form of electronic risk assessment tools (e.g., falls risk), and two are using electronic clinical pathways and/or disease management programs. One has functionality for automated alerts for laboratory draws, while another reports some limited functionality whereby staff could access stored dates in some of the provider's facilities (although this was not classified as an automatic alert). Two of the providers note they have functionality for automated prompts for unusual events (e.g., medication errors) and decision-support for e-prescribing. Automated prompts for preventive practice are in use at only one provider site. Two of the respondents note that they have results management tools. No provider reports that it uses alerts for F-tag compliance (survey deficiency tags).

Care plan monitoring software has been implemented by three NH providers and two have functionality for trending clinical data (e.g., vital signs). An additional provider has the functionality but has not yet trained the staff. Two respondents note that they have secure electronic messaging between: (a) staff within the facility; and (b) staff external to the facility (e.g., physician, pharmacy). None report the use of systems for electronic health information exchange with patients and families, although one noted the functionality was present but not yet in use. Patient education materials that can be accessed by clinical staff and printed for use in patient teaching were available electronically in only one facility. All four providers using EHRs have security features, such as the ability to set permissions and authenticate users. Two have systems allowing physicians and pharmacists to access the EHR. Computerized provider order entry (CPOE) is in use by three of the providers, while another has not yet implemented the functionality even though they have purchased it.

Medications: While only two of the NH providers use automated Medication Administration Records (MARs) (one with barcode technology to enter medications), three have the ability to record and product medication lists electronically. Three respondents report having applications for checking medication lists for side effects, potential adverse events, and other alerts. Four facilities report that they own products that support e-prescribing, but only two currently are using those products.

Telemedicine/telehealth: None of the responding NH providers reported use of any of the applications within this domain.

IV. DISCUSSION

All participating NHs report using many or all applications listed with the Administration domain. Fewer of the Operations Management functions are automated. It is surprising that only two had automated activities such as staffing/scheduling or workflow management, as it is common to see short-term return on investment when automating some management functions. However, while many of the functions under the administration and operations management domain can be associated with cost savings and are intended to make NH facility operations more effective, most are not directly related to patient care. The exception is the Operations Management functions related to quality management activities. Providers using these reporting functions may initiate quality improvement efforts that can directly impact the way care is provided. It may be useful as part of Task 6 (the site visits) to visit one facility using several of these reporting functions to identify costs saved by automatic generation of the reports (e.g., we anticipate that significant time savings would be realized by not hand-tallying reports) and benefits in terms of improved ability to monitor quality of care and clinical outcomes.

Because selected providers were recommended to us from software vendors or identified through previous contacts by project staff and the task order manager, it was not surprising that all but one provider are using an EHR. However, the systems used and functionality varied considerably across the providers. The one provider not using an EHR had some limited functionality related to health data. It appears as though clinical assessment data, clinical notes, and summary reports are components of all the EHRs. While we will likely visit one or more NHs with fully implemented EHR systems, if those applications are considered part of a basic EHR system (i.e., a bundled "package" of applications purchased from a single vendor), it may be difficult to identify the costs and benefits of some of the individual applications. It may be necessary instead to identify a set of applications common to most/all NH EHR products and evaluate costs and benefits for that basic set of applications together.

The ability to electronically receive clinical data from external providers (including referral data), decision-support tools, and health information exchange tools were not in use by most of the respondents. Likewise, only two providers reported using e-prescribing functions. Because these applications may be purchased as system upgrades or stand-alone modules, it may be easier to identify specific costs and benefits. When evaluating costs and benefits of some of these more sophisticated applications, it may be useful to visit some facilities using the applications and others who are not. It may be possible that we would be able to identify both anticipated costs/benefits (from NHs who do not use these more sophisticated features but are interested in acquiring them) and realized costs/benefits from those NHs currently using the applications.

For the site visits, we may want to consider one or more NHs that has implemented a basic EHR, which would include at least the ability to enter, store,

retrieve, and view assessment data (including MDS), clinical notes, and produce summary reports. In addition, we could include one or more NHs with some of the more sophisticated EHR applications, particularly those related to decision-support, CPOE, and health information exchange with providers and/or patients, and one or more not using those functions but considering purchasing products to support the applications. As alluded to above, and given the government and industry's interest in and focus on e-prescribing, we likely should visit one or more NHs that use e-prescribing. We may consider visiting one NH using sophisticated quality management reporting functions. All but one of the five NH providers providing information on their products meet these criteria and could be considered candidates for site visits.

ATTACHMENT A: DRAFT TAXONOMY OF HIT APPLICATION FEATURES FOR NURSING HOMES

Please use this key when completing Columns 1 through 5 of the taxonomy.

Column		Instructions / Key
1	**Product(s) that support this feature (1, 2, 3 from above list)**	Please list the product(s) that support this feature of the taxonomy (using the products that you have listed at the top of each separate Domain page -- 1, 2, 3).
2	**Does this product interface with other products in or outside of your facility?** **(Y/N) If Yes, what?**	Please indicate what other products, if any, that this product interfaces with -- eiither inside your facility or outside of your facility.
3	**Current or Planned Usage**	Please note for each application your current or planned use as follows: 1 - We have this application and are currently using it 2 - We have this application but are not using it 3 - We plan to purchase this application in the next 12-24 months 4 - We do not have current plans to purchase this application, but would like to do so at some point in the future 5 - We do not have this application and have no desire to obtain it
4	**Types of Employees, Disciplines using this application**	For each application that you are currently using or own but are not currently using (#1 or #2 in the previous column), please note the types of employees who are using the application (e.g., administrative staff, nurse, therapist, aide, pharmacist, etc.)
5	**Extent of Use**	For each application that you are currently using or own but are not currently using, please note the extent of use in your nursing facility as follows: 1 - This application is fully implemented and all appropriate staff are using it 2 - This application has been partially implemented and in use by at least 50% of staff for whom the application is targeted 3 - This application has been partially implemented but in use by less than 50% of staff for whom the application is targeted 4 - This application has been purchased and staff training has been (or will be) scheduled 5 - This application has been purchased but we do not plan to use it at this time

Please list the product or products that you use in the Administration functions at your NH:

	Product Name(s):	Year Implemented:
1.		
2.		
3.		

A: ADMINISTRATION DOMAIN

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
A.1 Census Management	Pre-admission/referrals, Admissions, discharges, transfers, leave of absences, bed holds, census verification, current list of residents, available beds, admission/ discharge/transfer/leave reporting.					
A.2 General Ledger/Accounts Payable	G/L, A/P, cash flow, financial statements, bank reconciliation, budgeting.					
A.3 Verification of Insurance & Eligibility for Services	Allows online verification of insurance information and coverage for services. This can be facilitated electronically by the use of HIPAA x12 transaction code sets.					

A: ADMINISTRATION DOMAIN

Application Features		Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
A.4	Accounts Receivable/Billing	Calculates resource utilization category (RUG) or state case mix. Charges can be RUG/Casemix based or ad-hoc or recurring. Electronic generation & submission of UB-92, UB-04 and CMS 1500 forms or other billing forms. Electronic billing is facilitated with the use of HIPAA x12 transaction code sets. Reference file of codes to support accurate coding to maximize reimbursement (including any facility-specific exceptions or alerts). Finance charge application and tracking. Charge & payment adjustments, Cash receipts, may include electronic remittance advices and transfer of funds, lock-box payments, Credit/collections including account inquiry & aging, collection follow-up notes and tracking, delinquent account worksheet.					
A.5	Tracks Medicare/nonMedicare Claims Denials	Tracks denials through resubmission of claim. Electronic notification can be facilitated with the use of HIPAA x12 transaction code sets.					
A.6	Resident Trust Fund Management	Tracks trust funds, deposits & withdrawals, Interest calculation and allocation automatic reminder when a resident's balance approaches the maximum allowed by Medicaid.					
A.7	Contracts Management	Tracks payer contact information, contractual agreements, negotiated payer rates, covered services & conditions, authorization dollar, time and unit limits. Allows the evaluation of proposed contracts based on historical data, ability to bill according to contract terms and monitor for appropriate reimbursement.					
A.8	Payroll	Automated payroll, calculates deductions, manages accrued leave balances, check writing capabilities.					

Please list the product or products that you use in the Operations Management functions at your NH:

Product Name(s): Year Implemented:

1. _____
2. _____
3. _____

B: OPERATIONS MANAGEMENT DOMAIN

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
B.1 Registration	Patient Intake, includes data on demographics, caregiver and emergency contact, next of kin, physicians, initial orders, diagnoses, allergies, payers, resident-selected providers such as pharmacy, pharmacy plans, funeral home, hospital, etc. Generation of face sheet. May allow electronic receipt of admissions data from another facility.					
B.2 Online Access for Referrals	Interfaces for hospitals or physician offices to refer patients, may include interfaces for receipt of electronic discharge information (e.g., ECIN or E-Discharge). May also include real-time portal access to discharging systems.					
B.3 Acuity Assignment	Automatic assignment of a resident into an acuity class based on a user-defined total attribute point value, for aid in appropriate staffing (e.g., patients may be identified as acuity levels 1-4, with 4 requiring the highest staffing ratio and 1 requiring the lowest staffing ratio).					
B.4 Staffing/Scheduling	Allows coordination of staff shift assignments depending upon census level and acuity (NH), tracks employee availability.					
B.5 Staff Time/Attendance Tracking	Capability to capture time clock data, record detailed hours worked, links with staffing/scheduling and payroll.					

B: OPERATIONS MANAGEMENT DOMAIN

Application Features		Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
B.6	Personnel Management	Tracks eligibility, licenses, skill level, discipline, captures performance review dates and evaluation results, captures disciplinary actions, staff development activities and clinical in-services, OSHA reports for employee injuries/illnesses.					
B.7	Workflow Management	Assigns and prioritizes tasks for care providers and financial personnel, allows timelines and due dates to be set, issues reminders for due dates, may also include reporting capabilities for staff productivity, task completion, and resource utilization. Tasks may be generated automatically as conditional alerts. Personnel to-do lists help organize and prioritize tasks.					
B.8	User-defined Financial Management Reports	Generates reports to monitor financial factors such as revenue, receivables, costs, pro forma profits, cash flow, staffing ratios vs. costs, RUG days/month, etc.					
B.9	Facilities/Materials Management	Purchasing and inventory management, may allow for capture of charges at point of service. May allow for service contracts. Management of housekeeping and laundry/linen services. Track service date renewals for plant and equipment.					

B: OPERATIONS MANAGEMENT DOMAIN

Application Features		Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
B.10	Dietary Management	Menu planning & production system, using resident profile information (diet, consistency, likes, dislikes, special requests, etc.) and compares it to cycle menu to make selections for the residents which are printed on individualized tray tickets. These tray tickets show what every resident is to be served including food items, specific portions, sizes, consistency modifications and special notes. May also include exact tally production sheets, scaled recipes, and nourishment and snack labels. May also include weight tracking and therapeutic note capabilities. May also include resident-specific intake nutritional analysis.					
B.11	Pharmacy Management	Pharmacy online adjudication to third-party payers (using National Council for Prescription Drug Programs (NCPDP) 8.1 for claim transactions and NCPDP Formulary and Benefit Standard for formulary and benefit notification), pharmacy cycle fill period, fill list, integrated with formularies and provides list of alternate drugs, accommodates ordering of floor stock pharmacy items, inventory control for narcotics, return medication credits/adjustments.					
B.12	Medications Tracking/Billing	Allows for tracking of costs and coverage of patient medications, interfaces with billing system.					

B: OPERATIONS MANAGEMENT DOMAIN

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
B.13 MDS Data Management (i.e., entry, editing, transmission)	Allows MDS data collected via paper, scan sheets, other assessments or other devices at the point-of-care (POC) (e.g. PDA) to be data entered (or scanned), edit checks run, allows for data correction, and export of data to the state repository. Includes RAVEN, and other commercial products. May generate triggers/guidelines to assist in the preparation of the care plan. Calculates RUG to electronically feed to billing. MDS assessment scheduling is provided along with follow-up and compliance reporting. This is the manual collection of data that are then entered into some other software. Devices that interface directly with the EHR/electronic medical record (EMR) are noted in C.3.					
B.14 Quality Management Activities & Reporting	Allows the aggregation of data and reporting for program quality assessment and management purposes. The next few indented rows describe various quality management reports and activities available for NHs.					
B.14.a Incident Reporting	Reports on incident for residents, staff, visitors and pedestrians with incident on property but not visiting the facility.					
B.14.b Tracking of Adverse Occurrences (e.g., falls, med errors)	Tracks by staff charting.					
B.14.c Tracking of Infections	Tracks by staff charting.					
B.14.d Calculation of Outcomes from MDS Data (e.g., hospitalization)	Tracks by staff charting or direct input by hospital.					

B: OPERATIONS MANAGEMENT DOMAIN

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
B.14.e Risk Audits for Quality Areas of Concern for Surveyors (e.g., wounds)	Use may define quarries from all data in the system. Wound tracking is fully integrated.					
B.14.f "Dashboard Reports" of Key Quality Indicators (e.g., hospitalizations, infections and falls)	Tracked by staff charting and report generation.					
B.14.g Occupancy Rates & Trends	Through reports from system data.					
B.15 Reporting & Population Health Management	Allows electronic reporting for federal, state, local (and accrediting agency) required information on patient safety and quality for tracking population health status including prevalence, incidence and aggregate health status measure. Includes the ability to notify appropriate public health agencies for certain reportable conditions (e.g., tuberculosis, etc.) or transmit specific required information to registries (e.g., immunizations).					
B.16 Electronic Access to Clinical Guidance	Allows care provider online access to information for use in clinical decisions or care planning (e.g., online access to health libraries offering clinical journals).					
B.17 De-identified Data Request Management	Provide data in a manner that meets federal, state and local requirements for de-identification.					
B.18 Policy/Procedure Database	Allows care provider to access policies procedures online.					

Please list the product or products that you use in the EHR/EMR functions at your NH:

	Product Name(s):	Year Implemented:
1.		
2.		
3.		

C: ELECTRONIC HEALTH RECORD (EHR/)/ELECTRONIC MEDICAL RECORD (EMR)[1] DOMAIN

Application Features		Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
C.1	Maintain Patient Record/Health Information Capture, Management, & Review	Identify and maintain a single patient record for each patient. This includes capturing data using standardized code sets or nomenclature, or unstructured data. Details of who entered the data and when they were captured are tracked.					
C.2	Patient Consent, Authorizations & Directives	Allow for the capture and maintenance of information regarding patient consent (including psychopharmacological medication use consent), participation in or attendance at care plan meetings, specific authorizations, and advance directives. Patient consents, authorizations and directives can be captured via a scanned document, indication of signature on file or an electronic signature. Provide alerts or notifications at time of episodic event.					

[1] EHR Systems are defined in the HL7 EHR FM DSTU as: (1) a longitudinal collection of electronic health information for and about persons, where health information is defined as information pertaining to the health of the individual or health care provided to an individual; (2) immediate electronic access to person and population-level information by authorized, and only authorized, users; (3) provision of knowledge and decision-support that enhance the quality, safety, and efficiency of patient care; and (4) support of efficient processes for health care delivery. HIMMS defines an EHR as a "computer-based longitudinal records of patient health information generated by one or more encounters in any care delivery setting." The EHR is intended primarily for use by health care providers. For the purposes of this taxonomy, we consider that an EHR is an integrated record containing information crossing provider settings and is compliant with (or is becoming compliant with) existing interoperability standards. We consider EMRs to be a subset of EHRs and are used and maintained by a single provider setting.

C: ELECTRONIC HEALTH RECORD (EHR/)/ELECTRONIC MEDICAL RECORD (EMR)[1] DOMAIN

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
C.3 Comprehensive Initial & Follow-up Assessments & Patient-originated Data	Manage, create, and maintain required or other assessment data via POC software (e.g., laptops, PDAs, etc.) upon admission to NH and at prescribed time points. Note: In NHs, this includes the production of MDS, which is a summary report of assessment data collected over a period of time by a variety of disciplines. The MDS and other assessment data are integrated with the EHR. Assessment information includes data on patient history, allergies/sensitivities, patient preferences, and other relevant patient information.					
C.4 Summary Reports	Allows aggregation of EMR data to generate brief, clinically relevant assessment summaries, discharge summaries, transfer summaries, and other summary reports. Functionality for electronic transmission of reports is listed under Secure Electronic Messaging.					
C.5 Clinical Notes	Create, addend, correct, authenticate, and close clinical visit data (including assessments/clinical measurements, interventions, communications, etc.) in structured or nonstructured (i.e., text) format. Data may be captured via direct data entry at POC through laptops, hand-held devices such as PDAs, kiosks located outside patient rooms, computers located at bedside, or voice-activated dictaphones for later transcription. May or may not maintain separate notes by discipline.					
C.5.a Physician						
C.5.b Pharmacy/Pharmacist						

C: ELECTRONIC HEALTH RECORD (EHR/)/ELECTRONIC MEDICAL RECORD (EMR)[1] DOMAIN

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
C.5.c RN/LPN						
C.5.d PT						
C.5.e OT						
C.5.f SLT						
C.5.g SW						
C.5.h Dietician						
C.5.i Clergy						
C.5.j Aide/Attendant						
C.5.k Therapy Aide						
C.5.l Volunteers						
C.6 Receive External Clinical Documents	Electronic receipt of external facilities/agencies, provider notes, laboratory data, radiology data, medical devices, patient history, patient consults, pharmacy/consultant pharmacist reports, etc. May capture import of paper documents by scanning and include with other EHR data. May also include the ability to view existing documents that were captured by other systems.					
C.6.a Laboratory Data						
C.6.b Radiology Data						
C.6.c Patient Consults						
C.6.d Patient History/ EMR from Other Settings						

C: ELECTRONIC HEALTH RECORD (EHR/)/ELECTRONIC MEDICAL RECORD (EMR)[1] DOMAIN

Application Features		Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
C.7	Problem List	A list of all active patient problems; may be included in functionality supporting the plan of care. May typically be considered part of the care planning functionality (C.8)					
C.8	Care Planning/Goal Setting	Electronic POC data collection and availability of data for generation of the plan of care and goal setting. May allow for plans of care required by CMS or others. May be limited to an overall Plan of Care, or may allow for discipline-specific plans of care (e.g., therapy plans of care and nursing plans of care). Care Planning/Goal Setting is an outgrowth of the assessments. Electronic facilitation of selected goals for a resident should be prompted from the assessment process.					
C.8.a	Single Interdisciplinary Plan of Care						
C.8.b	Acute Problem Plan of Care/Single Plan of Care						
C.8.c	Discipline-Specific (e.g., therapy) Plan of Care						

C: ELECTRONIC HEALTH RECORD (EHR/)/ELECTRONIC MEDICAL RECORD (EMR)[1] DOMAIN

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
C.9 Decision-Support	Clinical support tools providing best practice suggestions for care plans and interventions, based on clinical problems/diagnoses, may include alerts or reminders for specific interventions, tools for assessing risk of various conditions frequently seen in elderly residents using PAC. May be user-defined. Online Analytical Processing data may be utilized to allow detailed analysis. Trending models may be used to predict and identify risks. Indented examples below are applications found in the review of long-term care software available today.					
C.9.a Electronic Clinical Pathways/Standardized Care Plans	Includes both automated pathways and documentation/alerts for patient-level variances (i.e., instances when a patient's care deviates from the prescribed pathway).					
C.9.b Disease Management Programs						
C.9.c Automated Alerts for Lab Draws (when due)						
C.9.d Automated Prompts for Unusual Events (e.g., medication errors, etc.)						
C.9.e Automated Prompts for Preventive Practices (e.g., immunizations)						
C.9.f Decision-Support for e-prescribing. May include Dosing; Drug Selection; Drug-to-drug Interactions; Drug-to-food Interactions						

C: ELECTRONIC HEALTH RECORD (EHR/)/ELECTRONIC MEDICAL RECORD (EMR)[1] DOMAIN

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
C.9.g Risk Assessment Tools (e.g., dehydration risk, contracture risk, falls risk, pressure ulcer risk, etc.)						
C.9.h Results Management	Manage current and historical test results with the ability to filter and compare results.					
C.9.i Alerts for SOM/F-tag compliance						
C.10 Care Plan Monitoring	Allows monitoring of the effectiveness of care plans or clinical interventions. Intervention completion may also be monitored.					
C.11 Trending	Provides graphical and/or tabular displays for trending and analysis of information such as vital signs, weight, lab results including blood sugar levels, intake and output, etc. May include queries to analyze for unusual findings. Dashboard items may be used to represent the data.					
C.12 Secure Electronic Messaging	Allows intra-facility communications to facilitate health information exchange and coordination among care providers. Extra-facility communications provide methods for communicating with clinicians or other health settings. Data may also be viewed in place for other systems, with the appropriate security provisions.					
C.12.a Intra-facility						
C.12.b Extra-facility (with MD, pharmacy, pharmacy consultant, laboratory, etc.)						

C: ELECTRONIC HEALTH RECORD (EHR/)/ELECTRONIC MEDICAL RECORD (EMR)[1] DOMAIN

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
C.12.c Health Information Exchange with Patients & Caregivers	Allows for the two-way exchange of information between a patient health record and the EHR/EMR. This includes electronic communication with the next of kin should they need to know if/when there is an incident with the patient. These data are best viewed in place to retain control of the data. The HL-7/ASTM CCD is a standard mechanism for caregiver communication upon admission/discharge. Closely related to telehealth correspondences between physicians/nurses and patients (E.9. Communication with patient/family for access to relevant patient information (e.g., labs, visit schedules, patient updates)).					
C.13 Patient Education	Generation of patient education materials or electronic access to standardized patient education materials that can be printed out for patient teaching activities. (Systems that provide automated patient teaching programs are listed under the telehealth/telemedicine domain.)					
C.14 Security/Privacy	Permissions setting, user authentication, reports on access of EMR, disaster recovery plans. Includes patient access to record. Also includes archiving data and auditing of data. Full compliance on the HIPAA security & privacy rules should be provided.					
C.15 Physician &/or Pharmacist Access to EMR	Provides mechanism (e.g., portal) for remote access to the EMR by attending, admitting, consulting, & covering physicians and pharmacists.					

C: ELECTRONIC HEALTH RECORD (EHR/)/ELECTRONIC MEDICAL RECORD (EMR)[1] DOMAIN

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
C.16 Computerized Provider Order Entry (CPOE)	Allows provider orders for diagnostic and treatment services to be entered electronically by a prescriber, nurse, or pharmacist (as allowed by facility policy, state laws and other regulations), with or without computerized medication ordering (D.4.1 or D.4.2) CPOE can be implemented with or without an e-MAR (D.1). Transaction could occur via the use of a portal or electronic transmission.					

Please list the product or products that you use in the Medications functions at your NH:

Product Name(s): Year Implemented:

1. _____
2. _____
3. _____

D: MEDICATIONS DOMAIN [While many of the applications within this domain fall under the EHR/EMR domain, but with the emphasis of the potential cost savings and increase in quality of care of electronic applications related to medications.

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
D.1 Medication Administration Record (MAR)	All medications administered to patients are recorded into the MAR (which can be mediated by a kiosk, laptop, PDA, or bar code reader). Generated from the medication list. May also allow provider to view recent lab results and patient allergies. Interfaces with pharmacy system, computerized order entry system, and patient tracking (admission-discharge-transfer) system. Medication inventory tracking including receipt and disposition of medications. Administration teaching instructions should be provided.					
D.2 Medication List	Allows creation of a list of all medications at admission and amendments as medications are changed or updated. In NHs may serve as a reconciliation or continuity of care tool. May contain orders from multiple health care providers.					
D.3 Medication Checking	Allows medications to be checked by nonphysicians for side effects, potential adverse events, duplicate drug therapy, medication precautions, storage, missed dose, and overdose (e.g., medication regimen review). May include decision-support and printable patient education forms. An EHR could have this application without having CPOE.					

D: MEDICATIONS DOMAIN [While many of the applications within this domain fall under the EHR/EMR domain, but with the emphasis of the potential cost savings and increase in quality of care of electronic applications related to medications.

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
D.4.1 Electronic Prescribing Between Practitioner & Pharmacies (two-way functionality)	Electronic transmission of prescription information between health care providers and pharmacies. Transmission of prescriptions using stand developed by the NCPDP may or may not be in use. Typically involves ordering of medications using a PDA or computer, may also include decision-support.					
D.4.2 Electronic Prescribing Between Physician, Pharmacy & Nursing Home (three-way functionality)	Same as above. Transmission of prescriptions using stand developed by the NCPDP may or may not be in use. Three-way functionality may be present in NHs, although currently NH use of e-prescribign is prescriber to facility and facility to pharmacy (e.g., little direct communication between prescriber and pharmacy).					
D.5 Barcode Medication Administration	A hand-held barcode scanning device is used to scan barcode information (e.g., on the patient's wristband ID), the packaging of the medication to be dispensed, and the administering nurse's ID. After all required barcodes are scanned, the system confirms the patient's identity, matches the patient with the medication order, and confirms that the administering nurse has the authority to dispense the medications. If any problems are identified, the administering nurse will be notified via a combination of warning tones and text messages. The system then records the transaction information and stores it on an electronic MAR.					

D: MEDICATIONS DOMAIN [While many of the applications within this domain fall under the EHR/EMR domain, but with the emphasis of the potential cost savings and increase in quality of care of electronic applications related to medications.

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
D.6 Automated Medication Dispensing Systems	Automated Medication Dispensing Cabinets provide computer controlled storage, dispensation, tracking, and documentation of medication distribution at the POC on the resident care unit. Tracking of the stocking and distribution process can occur by interfacing the unit with a central pharmacy computer. These cabinets can also be interfaced with other provider databases such as resident profiles, the facility's admission/dis-charge/transfer system, and billing systems.					
D.7 Personal Automatic Medicine Dispensers	Programmable, locked devices that will automatically dispense a dose of dry medications at predetermined times. May alert patient/resident when it is time to take medication with audible alarms, lights, text, and voice messages. May also include online monitoring capabilities to track dispensing activity and can contact caregivers or a monitoring service when medications are not dispensed per the prescribed regimen.					

Please list the product or products that you use in the Telemedicine/Telehealth functions at your NH:

Product Name(s): Year Implemented:

1. _____
2. _____
3. _____

E: TELEMEDICINE/TELEHEALTH DOMAIN [Telehealth uses a wide range of information and communications technologies to provide specialist referral services, patient consultations, remote patient monitoring, medical education, and consumer medical and health information through networked programs, private connections, primary and specialty care to the home, and a growing range of Web-based e-patient services (American Telemedicine Association, http://www.atmeda.org/).]

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
E.1 Telemonitoring of Vital Signs, Weights, EKG Findings	Electronic devices to measure and transmit information. Data can include blood pressure, pulse, weight, blood glucose, EKGs, pulse oximetry, Peak Expiratory Flow and Forced Expiratory Volume, etc. Examples are "smart toilets," Internet-enabled weight scales, electrocardiograms, or devices that can be placed on a television cable box, telephonic stethoscopes for ausculating heart, lung and bowel sounds.					
E.2 Telemonitoring for Incontinence (Enuresis alarms)	Provide an alert (to caregivers or residents themselves) when a resident is incontinent. These devices typically consist of a moisture-detecting sensor, which is connected to an alerting device. Sensors can take several forms including probes that are placed in undergarments, undergarment pads, and moisture absorbing bed pads or larger sensor pads that are placed under the sheets of the resident's bed. Alerts may be audible, flashing lights, and vibrating alerts. May have the capability of alerting the caregiver via a paging device or through the facility's assistance call system.					

E: TELEMEDICINE/TELEHEALTH DOMAIN [Telehealth uses a wide range of information and communications technologies to provide specialist referral services, patient consultations, remote patient monitoring, medical education, and consumer medical and health information through networked programs, private connections, primary and specialty care to the home, and a growing range of Web-based e-patient services (American Telemedicine Association, http://www.atmeda.org/).]

Application Features		Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
E.3	Telemonitoring for Falls	Devices that signal a caregiver when a resident who is at risk for falling attempts to leave a bed, chair, wheelchair, or toilet unattended. Most consist of a pressure sensor connected to a control unit with an alarm. The size and shape of the sensor depends on the application (chair, bed, or toilet). A single control unit is often compatible with several sensor types, enabling one control unit to be used in several applications. When the resident rises and removes pressure from the sensor, the control unit provides an alert to the caregiver.					
E.4	Telemonitoring for Room Departure, Prolonged Time in Bathroom, & Restlessness Within Own Room	Sensors that notify caregivers of room departure or bed departure.					

E: TELEMEDICINE/TELEHEALTH DOMAIN [Telehealth uses a wide range of information and communications technologies to provide specialist referral services, patient consultations, remote patient monitoring, medical education, and consumer medical and health information through networked programs, private connections, primary and specialty care to the home, and a growing range of Web-based e-patient services (American Telemedicine Association, http://www.atmeda.org/).]

Application Features	Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
E.5 Tracking Systems	Tracking systems are used to locate a resident who has left the facility, using radio frequency (RF) signals or Global Positioning System (GPS) technology. Tracking systems that use RF technology usually consist of a transmitter worn by the resident and a hand-held tracking device used by the caregiver to locate the resident. Tracking systems using GPS technology combine the use of GPS satellites, digital wireless networks, and the Internet to locate a wandering resident anywhere that digital wireless network service is available. The resident must wear a signaling device (i.e., watch, a pager sized clip-on device, or a box-like device that can be placed in a fanny pack or rucksack). The care provider can use the Internet to locate a resident via a computer, mobile phone, or PDA or by calling a central monitoring station via telephone. In addition to locating a lost resident, many of these systems have the ability to alert a caregiver when the resident has left a predetermined area and when the resident has fallen. Systems may track residents with the facility, and may include a wander guard system to prevent wandering (e.g., sprinkler system).					
E.6 Medication Reminders (see Medication domain)						
E.7 Virtual Visits	Video monitors with audio capability, can be patient's home telephone line or IP systems. Allow the care provider and patient (or other care provider) to view one another and have a two-way audio dialogue for the virtual visit.					

E: TELEMEDICINE/TELEHEALTH DOMAIN [Telehealth uses a wide range of information and communications technologies to provide specialist referral services, patient consultations, remote patient monitoring, medical education, and consumer medical and health information through networked programs, private connections, primary and specialty care to the home, and a growing range of Web-based e-patient services (American Telemedicine Association, http://www.atmeda.org/).]

Application Features		Definition	1 Product(s) that support this feature (1, 2, 3 from above list)	2 Does this product interface with other products in or outside of your NH? (Y/N) If Yes, what?	3 Current or Planned Usage (see Key)	4 Types of Employees, Disciplines using this application	5 Extent of Use (see Key)
E.8	Communication with Patient/Family for Access to Relevant Patient Information (e.g., labs, visit schedules, patient updates).	Typically via secure web connections. Closely related to EHR/EMR (C.12.C) -- Health Information Exchange with patients and caregivers .					
E.9	Teleimage Transmission	Transmission of X-ray and other still images (store and forward) to consulting specialists or primary care providers.					