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

SURVEY QUESTIONS FOR EHR ADOPTION AND USE IN NURSING HOMES:

FINAL REPORT

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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.

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Andrew Kramer, MD
Meg Kaehny, MSPH
Angela Richard, MS, RN
Karis May

University of Colorado, Denver
Division of Health Care Policy and Research

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I. INTRODUCTION

Despite the potential of health information technology (HIT) to improve quality and efficiency of care in nursing homes and the national priority placed on adoption of HIT, information on HIT adoption in the nursing home setting is relatively scarce, and the reported estimates of nursing home HIT adoption are inconsistent. For example, estimates of nursing home adoption of electronic health record (EHR) or electronic medical record (EMR) adoption range from 18 percent to 47 percent and estimates of computerized or electronic provider order entry in nursing homes range from 16 percent to 48 percent (Richard, Kaehny, May, and Kramer, 2008). While most estimates suggest that HIT adoption rates are relatively low in nursing homes, in terms of use of non-administrative HIT applications, surveys have used varying definitions of HIT/EHR (or no definitions at all). The lack of consistent, well-defined terminology makes the accuracy of national adoption estimates difficult to ascertain (Robert Wood Johnson Foundation, 2006). Although the Office of the National Coordinator (ONC) for Health Information Technology released "consensus definitions" of EHR and EMR in April 2008 (National Alliance for Health Information Technology, 2008), the estimates referenced in this report resulted from surveys that used varying definitions of EHR or EMR and therefore do not necessarily reflect EHR or EMR use as defined by the ONC consensus definitions.

Although the National Nursing Home Survey (NNHS) sponsored by the National Center for Health Statistics (NCHS) has established a valuable starting point with its current item addressing nursing home HIT use, the single dichotomous item is limited in its breadth and precision. In addition, some current surveys designed to assess nursing home HIT/EHR adoption (e.g., a California HealthCare Foundation study on long-term care provider readiness; a Minnesota Department of Health/Stratis Health survey on use and intended use of EHRs among Minnesota nursing homes), are state-specific and may not be generalizable to the national nursing home community. More detailed and specific tools for assessing HIT adoption in hospitals and physician offices exist, but these are not directly applicable to nursing homes because of the unique care and HIT requirements in long-term care.

Policymakers need reliable and valid data on HIT adoption rates for nursing homes to assess movement toward the goal of promoting EHR adoption and inform decisions about the policy actions needed to accelerate adoption. To meet these needs, the Office of the Assistant Secretary for Planning and Evaluation (ASPE) in the U.S. Department of Health and Human Services (HHS) funded the University of Colorado Denver (UCD) to develop two survey instruments. The first instrument was to be a relatively narrow set of "core" survey questions, for possible administration with the NNHS or other surveys, designed to assess and track HIT adoption rates over time and to obtain information on perceived barriers and benefits associated with HIT use. The second instrument was intended to be a more comprehensive, expanded survey containing both the core questions and follow-up questions designed to obtain additional detail on electronic functions that are actively in use in nursing homes.

As described in this report, the project was aimed at developing a core survey that has the sensitivity to capture change over time in nursing homes' level of automation and, whether fielded in conjunction with the NNHS or through other means, will provide a valuable snapshot of nursing home HIT use while establishing a baseline from which to track future growth. The project also was aimed at producing an expanded survey useful for gathering greater detail on automated functions that are actively in use at nursing homes. The expanded survey may be of particular utility for entities (e.g., provider associations, corporations, individual nursing homes) seeking a comprehensive and rich picture of HIT use in targeted nursing home(s) and/or detailed information on the use of particular functionalities (e.g., e-prescribing).

Additional background information on the potential benefits and use of HIT in nursing homes is provided in Section II of this report. Section III describes the literature review and technical expert panel (TEP) work conducted under this project that shaped the development of the core and expanded surveys presented in this report. Section IV and Section V present detailed information on the content of and administration recommendations for the core survey and the expanded survey, respectively. Section VI discusses recommendations for pilot testing the surveys.

Although the core and expanded surveys were designed to gauge HIT use in nursing homes, with modest wording changes (e.g., replacing references to "facility" with "organization" or "care setting"; replacing references to the MDS with "regulatory assessments"), the surveys also may be useful in other care settings in the long-term and post-acute care supports and services spectrum, or even cross-care settings.

II. BACKGROUND ON HIT USE IN NURSING HOMES

HIT refers to an array of computer applications for health care, ranging from those used by administrators (e.g., census management, billing), managers (e.g., staffing and scheduling modules), direct care providers (e.g., EHRs) and in some cases, patients (e.g., personal health records) (UCD, 2007). An EHR is defined by the Healthcare Information and Management Systems Society (HIMSS) as a "longitudinal electronic record of patient health information generated by one or more encounters in any health care setting…including patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and radiology reports" (HIMSS, 2007a). The Institute of Medicine (IOM) specifies that an EHR includes: (1) longitudinal collection of electronic health data for and about persons; (2) immediate access to health data pertaining to an individual by authorized users; (3) provision of knowledge and decision support to enhance quality, safety, and efficiency of patient care; and (4) support of efficient processes for healthcare delivery (IOM, 2003). Consensus definitions released by the ONC in April 2008 define an EMR as "an electronic record of health-related information regarding an individual that conforms to nationally adopted interoperability standards and implementation specifications, and that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization". EHR is defined the same way with the exception of being "created, gathered, managed, and consulted by authorized clinicians and staff across more than one health care organization".

EHRs have the potential to improve quality, patient safety (particularly related to medication errors), and patient satisfaction and to decrease costs and inefficiencies by making current patient information and clinical decision making tools instantly accessible to clinicians in an easily-readable format (Booz Allen Hamilton, 2006; Shekelle, Morton, and Keeler, 2006; Bates and Gawande, 2003; Kaushal, Shojania, and Bates, 2003; Bates, 2002). By minimizing the number of times that patient care information is manually re-entered into a health record, potential transcription errors and redundant procedures can be avoided (Coleman, May, Bennett, Dorr, and Harvell, 2007). A recent study of perceived costs and benefits of HIT in nursing homes and home health agencies found four primary categories of perceived benefits: (1) anywhere and anytime access to the clinical record, including access by more than one simultaneous user; (2) greater efficiency in meeting administrative and federal requirements in long-term care, including shorter billing cycles and fewer claims denials, and improved documentation of compliance with Conditions of Participation; (3) improved quality management through reports, alerts, and decision support tools; and (4) health information exchange technology to enhance care coordination and data accuracy across providers (Kramer, Richard, Epstein, Winn, and May, 2009).

The implementation of interoperable HIT has become a national priority. IOM has recommended that "the U.S. health care system make a commitment to the

development of a health information infrastructure by the year 2010" (IOM, 2003). In April 2004, President Bush set a goal that most Americans have an EHR by 2014, and signed Executive Order 13335, establishing the Position of the National Health Information Technology Coordinator. The American Recovery and Reinvestment Act of 2009 provided $2 billion for implementing and/or evaluating HIT as part of a platform to improve health care quality, including the coordination of care, patient safety, and efficiency of care; and made available approximately $17 billion in Medicare and Medicaid payment incentives to eligible professionals and acute care hospitals for their meaningful use of certified EHRs.

The IOM identified the EHR-System (EHR-S) functions and timeframes over which these functions could be introduced for particular health care settings, including nursing homes (IOM, 2003). In late 2006, the Certification Commission for Healthcare Information Technology (CCHIT) was petitioned by long-term care stakeholder groups to include nursing homes in the development of certification criteria for EHR products. In the summer of 2009, CCHIT began its work to identify the EHR certification criteria for skilled nursing facilities, nursing facilities, home health agencies, long-term care hospitals, and inpatient rehabilitation facilities. CCHIT expects to begin certifying EHRs for Long-Term/Post-Acute Care providers in the summer of 2010. CCHIT is leveraging the Long-Term Care-Nursing Home EHR-System Functional Profile (the LTC-NH EHR-S Functional Profile) that was passed by Health Level 7 (HL7) as a Draft Standard for Trial Use in December 2008/January 2009. The LTC-NH EHR-S Functional Profile was developed by a workgroup of long-term care industry stakeholders, including representatives from the American Association of Homes and Services for the Aging, the American Health Care Association (AHCA), and the National Association for the Support of Long Term Care; along with representatives from organizations involved in standards development, including the American Health Information Management Association, HL7, and the National Council on Prescription Drug Programs, and with the support of ASPE within HHS.

III. METHODS

A. Literature Review

An extensive literature review was conducted to provide foundational understanding for the construction of new data items to measure HIT adoption in nursing homes. The literature review included nine surveys for nursing homes and other long-term care settings (e.g., assisted living facilities) pertaining to current HIT adoption and barriers to adoption, including the NNHS, a California HealthCare Foundation study on provider readiness, and a Minnesota Department of Health/Stratis Health survey on use and intended use of EHRs. Fifteen surveys on HIT adoption and use developed for other care settings including hospitals, ambulatory care, and home health agencies were identified and included in the review. These included the National Ambulatory Medical Care Survey, the National Home Health and Hospice Survey, surveys conducted by the Healthcare Financial Management Association, American Hospital Association, the Leapfrog Group, and others. The literature review report can be accessed on the ASPE Website at http://aspe.hhs.gov/daltcp/reports/2009/HITlitrev.htm and in Appendix A.

The literature review validated existing perceptions about the limitations of existing surveys for measuring HIT adoption. Although numerous survey instruments have been fielded to assess HIT use in various provider settings, the lack of consistent definitions, terminology, item construction, sampling frames, respondents, and measurement approaches render it difficult to accurately gauge current HIT adoption. The literature review, however, provided useful information that supported decisions about the content and design of the questions for a new survey. For example, the taxonomy of HIT applications available for use in nursing homes (UCD, 2007) provided extensive information on the administrative, operational, and clinical functions that could be supported by HIT applications. The nursing home HIT taxonomy can be accessed on the ASPE Website at http://aspe.hhs.gov/daltcp/reports/2007/Taxonomy-NH.htm; and http://aspe.hhs.gov/daltcp/reports/2007/Taxonomy-SDO.htm.

In addition, selected surveys supplied information on content and wording elements that were helpful. For example, a question on barriers to HIT adoption used in the national physician survey developed under an ONC contract (RTI International, 2006) provided the foundation for the design of similar data items for the core and expanded surveys. The use of six "personas" that delineate a range of levels of HIT usage in a survey by AHCA and the National Center for Assisted Living, and described in their white paper, "A Snap-Shot of the Use of Health Information Technology in Long Term Care" (2006), provided a useful conceptualization of levels of HIT usage. A Stratis Health survey of Minnesota nursing homes (Stratis Health, 2008) assessed software/technology use for a selection of key nursing home functions. The survey's inclusion of explicit descriptions of the work functions provided an example of an effort to enhance accuracy of HIT use estimates.

B. Technical Expert Panel

A group of individuals with expertise in nursing home administrative and clinical management, information technology (particularly applications for nursing homes), long-term care health policy, and survey development and administration was recruited to serve on a TEP for the project. (A list of TEP members can be found in Appendix B.1.) The role of the TEP was to provide feedback to guide survey item development and refinement. TEP activities included review and comment on several iterations of draft data items, along with recommendations for future efforts to field the survey. A TEP meeting was held in Washington, D.C. on September 24-25, 2008.

An initial set of survey data items was drafted and sent to TEP members for review prior to the September 2008 meeting. TEP members were requested to complete the draft core survey questions as if they were a nursing home provider, then give feedback on: (a) clarity of wording and suggestions for rewording; and (b) ability for a survey respondent to accurately characterize a facility's level of automation given the response options provided for each function in the early draft of Question 1. TEP members also rated all of the items in the draft core survey on a scale of 1-3 for clarity, importance to the survey, and the likelihood that the question would have response variability. (Appendix B.2 contains the review materials used to obtain TEP feedback on the draft questions prior to the in-person TEP meeting.)

Project team members compiled and summarized TEP input prior to the September 2008 meeting. A summary of the pre-meeting feedback and ratings (contained in Appendix B.3) was provided to TEP members during the meeting to guide the discussion. During the course of the meeting, TEP members offered extensive suggestions for survey item reconceptualization and rewording. (Notes from the TEP meeting are contained in Appendix B.4.) These suggestions became the basis for the first revision to the survey items. The revised draft survey questions were sent electronically to the TEP members in spring 2009, to obtain review and suggestions for additional refinements. Project staff incorporated TEP comments from the spring 2009 e-mail review to create the current iteration of the draft survey questions. The TEP also had the opportunity to review the survey items included in this draft final report prior to finalization of the surveys at the end of this project.

IV. CORE SURVEY: CONTENT AND ADMINISTRATION RECOMMENDATIONS

A. Core Survey Content and Rationale

The core survey (contained in Appendix C) contains nine questions, several of which include multiple sub items. The nine questions address the following topics:

1. Current level of automation and plans for additional automation for 21 clinical functions/applications;
2. Automated clinical decision support for 9 functions/applications;
3. Health information exchange capabilities for 13 functions/applications;
4. Automated systems to capture and query information relevant to health care quality;
5. Automated summary reports;
6. Telehealth;
7. Telemonitoring;
8. Perceived barriers to HIT adoption and use; and
9. Perceived benefits of HIT.

With the goal of limiting respondent burden and streamlining survey administration, efforts were made from the outset to limit the number of questions included on the core survey. It remains important to achieve a balance between obtaining key information and restricting the time commitment of respondents. The rationale for inclusion of the questions in the current version of the core survey is discussed below. The opinions and feedback of TEP members played a major role in decisions on survey content.

1. Current Level of Automation and Plans for Additional Automation (Question 1)

A key purpose of the survey is to gauge and track the current level of use of automated systems in nursing homes. Question 1 assesses level of use for 21 functions/applications, using the following three-point scale:

a -- Paper Only (no automation)
b -- Combination Paper/Electronic
c -- Fully Electronic, with Point of Care

The three response options are designed to facilitate clear and simple characterization of facilities' automation level by respondents. Early in the survey development efforts, the question included five response options that represented more detailed gradations of automation at facilities. While this approach would allow more precise characterization of facility automation levels and greater sensitivity to change over time, it also brought greater complexity to the question. The complexity could have

affected the consistency of interpretation by respondents and therefore survey reliability and accuracy of results, as well as increased respondent burden. The decision was made to somewhat reduce the sensitivity of the question in order to increase its simplicity and clarity; the use of three response options is less burdensome and should promote greater respondent accuracy while retaining sufficient sensitivity to monitor change over time.

Given the intent to administer the core survey questions routinely over ongoing time intervals, the survey will provide the ability to track changes and trends as the proportion of respondents that choose levels a, b, or c for the Question 1 sub items will move over time. Trends can be monitored nationally or at regional or local levels (e.g., city, county), or even within corporations or individual facilities.

Identifying functions/applications to include in the core survey posed a critical decision point in the developmental process. Question 1 and other core survey questions deliberately specify individual functions and applications, rather than referring to an EHR or EMR. These terms were excluded as they are associated with a wide range of interpretation despite various efforts to establish standard definitions. The focus on specific functions/applications also allows the survey to obtain valuable information on electronic features in use at nursing homes regardless of the function's place in a larger electronic system or health record. The list of functions/applications, which has undergone multiple iterations throughout the developmental process, includes those that are frequently-performed and/or are integral clinical and operational functions for which software applications are known to be available and in use at some nursing facilities. The list casts a wide net, offering the capacity to elicit information from facilities that use any HIT applications rather than only those with relatively sophisticated or widespread HIT use. The question design facilitates quick and straightforward response for each function/application.

Table 1 lists the functions/applications included in core survey Question 1.

TABLE 1: Functions/Applications Included in Core Survey Question 1 on Level of Automation

1. Resident (Patient) Demographics[b]	13. Assessments Other than MDS[a,b]
2. Advance Directives[b]	14. Care Plan[a,b]
3. Medical History	15. Task List
4. Clinical Notes: Attending MD[a,b]	16. Medication Order Entry by Physician or Other Authorized Personnel[a]
5. Clinical Notes: Licensed Nurse[a,b]	17. Other Order Entry by Physician or Other Authorized Personnel[a,b]
6. Clinical Notes: CNA observ., notes[a,b]	18. Results Viewing--Labs[a,b]
7. Clinical Notes: Other Disciplines (social services, therapy, dietary, others)[a,b]	19. Results Viewing--Radiology[a,b]
8. Problem List[b]	20. Results Viewing--Diagnostic Tests Other than Radiology or Labs[a,b]
9. Allergy List[b]	21. Results Viewing--Consults
10. Medication Administration Record[a]	
11. Treatment Administration Record[a]	
12. MDS Assessment/RAPS[a,b]	

a. Indicates functions/applications also addressed in core survey Question 2.
b. Indicates functions/applications also included in core survey Question 3.

Many of the functions/ applications from the list in Table 1 also are addressed in core survey Question 2 (automated clinical decision support) and/or Question 3 (health information exchange capabilities). Those functions/applications that are also addressed in Questions 2 and/or 3 are designated by the footnotes in Table 1. Questions 2 and 3 are described below.

2. Automated Clinical Decision Support and Health Information Exchange Capabilities (Questions 2 and 3)

Automated clinical decision support functions/applications and health information exchange capabilities are specifically designed to improve patient care delivery and safety by minimizing the risk of medical and transcription error, in addition to improving efficiency for care providers. These applications are particularly relevant to national policy goals of increasing HIT adoption rates to improve patient care quality and safety.

Automated decision support functions may be developed for various direct clinical functions, such as clinical assessments (e.g., prompts to remind care providers to assess immunization status; red flags for vital signs exceeding pre-established parameters); medication orders; medication administration record; and lab orders/results. Likewise, health information exchange capabilities may be available for several types of data, such as admission/transfer/discharge referral data; consults; lab orders/results; radiology images/results; and medication orders. Because these two types of capabilities affect a variety of clinical functions, these survey questions are designed to capture the type of clinical decision support and information exchange capabilities that the nursing home is using.

3. Automated Systems to Capture and Query Information Relevant to Health Care Quality and Automated Summary Reports (Questions 4 and 5)

Many nursing homes indicate that the use of report functions for quality management is one of the most valuable benefits of HIT (Kramer, Richard, Epstein, Winn, and May, 2009). These nursing home-level reports may be generated from data entered into an EHR and in some cases may be combined with information entered in administrative systems (e.g., reports of all residents who have received influenza vaccines; occupancy reports; or “dashboard” reports). Automated summary reports (e.g., discharge summary) pull information from the EHR for specific residents. Because both the quality management report and automated summary report functions may include a variety of reports, these questions are designed to capture the types of reports the nursing home is using.

4. Telehealth and Telemonitoring (Questions 6 and 7)

Telehealth is defined in the core survey as the use of electronic communication and information technologies to allow direct interaction between providers and patients in different locations. Examples include wound consultation by a physician at an offsite location using audiovisual equipment to perform a clinical assessment, and

interpretation of a real-time EKG reading by an offsite physician. Although telehealth is not currently in widespread use across nursing homes, the availability and use of telehealth applications is expected to grow over time. Inclusion in the survey provides a unique opportunity to track the growth of telehealth use in nursing homes over time.

5. Perceived Barriers to HIT Adoption and Use (Question 8)

In light of the current national push toward interoperable HIT and the continued relatively slow pace of growth of HIT adoption and use in nursing homes, it is valuable to obtain information from nursing home respondents regarding issues they find or found to be barriers to their purchase and/or use of HIT. This information can guide policymakers in identifying factors that contribute to slow adoption rates and make informed decisions about the policy actions needed to accelerate adoption.

6. Perceived Benefits of HIT (Question 9)

This question is included to obtain information relevant to research on the costs and benefits associated with implementing HIT. The question allows comparison of perceptions among facilities at various levels of automation (as indicated in core survey Question 1) to determine whether perceptions are associated with varying degrees of HIT use. For example, nursing homes that use no automation may perceive greater, lesser, or different benefits of HIT than those facilities that actively utilize HIT applications in support of their clinical work. Data from this question also could be analyzed to determine whether a particular presentation of HIT use is associated with the perception of particular benefits (e.g., if facilities that use a certain number of automated applications or particular applications, as indicated by responses to Question 1, tend to identify certain benefits; if facilities with full health information exchange capabilities, as indicated in responses to Question 3, perceive certain benefits compared to others).

B. Facility Characteristics Data

Five questions obtaining information on facility characteristics also are included on the core survey. The questions (other than the facility location question) are adapted from the NNHS Facility Questionnaire (NNHS FQ), with some wording modifications. The question topics, and affiliated NNHS question number for each, are: (a) facility location/state; (b) size/number of beds (NNHS FQ22); (c) chain affiliation (NNHS FQ5); (d) facility type (NNHS FQ8); and (e) ownership (NNHS FQ21).

The facility characteristics items are included on the core survey to ensure that this information is collected if the core survey is used as a stand-alone survey. If the core survey is fielded with the NNHS, the facility characteristic items should be eliminated, as the same information is collected through the NNHS.

C. Alignment of Core Survey with Existing National Surveys

Alignment of the core survey questions with existing national surveys was a consideration throughout the project, although it was agreed at the September 2008 TEP meeting that the development of effective questions for the specific purpose and setting addressed in this project must take precedence over alignment efforts. The current core survey questions are aligned with other surveys to the extent that a subset of the results--particularly related to a provider's level of electronic capabilities for various clinical work functions--could be compared with findings from NCHS surveys fielded in other provider settings (e.g., the National Home Health and Hospice Survey, the National Ambulatory Care Survey) and other existing surveys. This capacity for "cross-walking" can support interest in assessing HIT adoption across provider settings. The question on perceived barriers (Question 8) in the iteration that was discussed at the September 2008 TEP meeting was a modified version of a question on barriers included in the national physician survey developed under an ONC contract (RTI International, 2006). This question has since evolved into a condensed version using conceptual headings instead of listing individual barriers, as recommended at the TEP meeting in the interest of reducing respondent burden.

D. Recommended Administration Methods

The core survey questions could be administered as a stand-alone survey and also could be included in the fielding of the NNHS. The questions can enhance the HIT/EHR-related data item currently collected by the NNHS by gathering more specific information on the adoption of specified applications. A key advantage of fielding the core survey with the NNHS is the opportunity to utilize a pre-established data collection methodology to administer the survey to a large, representative group of nursing homes, resulting in findings that could be generalized to the nursing home industry. In addition, as the survey is fielded with nursing homes on a regular basis, it would be possible to track HIT adoption rates more closely over time. Data gathered from the core survey questions also could be considered along with other survey data to address other issues important for national health policy (e.g., whether there is a difference in rates of rehospitalization in nursing homes that use HIT applications versus those that do not).

If administered with the NNHS, it may be most effective to include the core survey questions with the NNHS Staffing Questionnaire, as suggested by NCHS staff, rather than administering the questions by computer-assisted personal interview as is done for the NNHS FQ. The Staffing Questionnaire is mailed or e-mailed to nursing home administrators and is self-administered (by hard copy) by the administrators or designated staff. NCHS staff subsequently review the completed hard copy of the Staffing Questionnaire and follow up with respondents during an onsite visit to clarify responses (e.g., reasons for missing data, confirming atypical responses). The simple design of the core survey questions facilitates straightforward pen and paper completion and would fit effectively with the Staffing Questionnaire data collection protocol.

Administering the core survey with the Staffing Questionnaire also may garner the benefits of improved data quality resulting from the follow-up by NCHS staff and a strong response rate due to respondents knowing that there will be follow up by NCHS staff during the facility visit. As noted, the core survey's design allows straightforward pen and paper completion and does not necessitate in-person administration or the conduct of an onsite follow-up visit; the core survey could easily and effectively be implemented independently of the NNHS by mail (or Web application) and without any onsite data collection or data confirmation visits.

Given that the next anticipated NNHS administration is in 2010 or later, waiting to administer the core survey with the NNHS would mean that national data from the survey would not be available for several years (allowing time for data analysis). With the current national emphasis on HIT, administration of the core survey as soon as feasible should be considered to establish a baseline. While the data collection interval does not need to be too frequent, it would seem that administration at least every two years would be important and informative. Within organizations adopting HIT systems, the survey could be used more frequently to track adoption.

V. EXPANDED SURVEY

A. Expanded Survey Content

The expanded survey includes both the core survey questions and follow-up questions designed to supplement the core survey questions. The expanded survey, formatted for pen and paper administration, can be found in Appendix D. (Recommended administration via an electronic, Web-based format is discussed in Section V.B.) The expanded survey includes the same set of five questions on facility characteristics as is included on the core survey, as described in Section IV.B of this report.

The expanded survey is designed to obtain greater detail in targeted areas where nursing homes are using HIT. The survey is a valuable tool for a variety of uses on a national, regional, or local level. It is useful for obtaining a comprehensive, detailed look at HIT implementation, whether targeting a particular region, corporation, or even individual building(s). The expanded survey also can be used to gather information on use of particular functionalities. Using the example of e-prescribing, the expanded survey can shed light not only on the pervasiveness of "paperless" medication ordering, or e-prescribing, but also collect more detailed information such as the most commonly used electronic data capture methods for e-prescribing; type and timing of decision support tools used; use of national standards for data exchange; and entities with which electronic data are exchanged.

The expanded survey includes follow-up questions related to Questions 1, 2, and 3 of the core survey, which address level of automation; automated clinical decision support; and health information exchange capabilities. Follow-up questions are answered only when triggered by particular responses to the core survey questions. For example:

- If a respondent answering Question 1 on the core survey selected level c (fully electronic, with point of care) to describe their facility's level of automation for its medication order entry (see core survey Question 1, sub item 1.16), when completing the expanded survey questions, the respondent would then answer a series of follow-up questions related to the facility's electronic medication order entry application (e.g., is the authoritative record paper or electronic; is the electronic system housed at the facility or hosted by a third party; how does electronic documentation/data capture occur).

- Expanded survey questions triggered by responses to core survey Question 2 on automated clinical decision support obtain more detailed information on such topics as the type of automated decision support tools (e.g., data quality checks/illogical data alerts; reminders for scheduled events; lab results management).

- Expanded survey questions associated with core survey Question 3 on health information exchange capabilities address such topics as the form/structure of information shared (i.e., non-structured; proprietary structure negotiated with vendors for system-to-system sharing; national standards-based data exchange) and the type of entities with which the facility exchanges electronic data (e.g., hospitals; pharmacies; home health agencies).

B. Administration Recommendations for Expanded Survey

The expanded survey is recommended for administration via an electronic, ideally Web-based, application to constrain respondent burden in terms of number of pages, time commitment, and perceived complexity. Respondents using the Web application would see only the specific follow-up questions that are triggered by their core survey responses, thus substantially reducing the average number of follow-up questions per respondent. Although a respondent using pen and paper administration of the expanded survey would be asked to respond only to the same triggered follow-up questions as a Web respondent, the pen and paper respondent would need to follow skip patterns on a hard copy document and flip through multiple pages, likely resulting in greater time commitment and greater perceived burden of effort. Although pen and paper administration is an option for the expanded survey, electronic administration simplifies and facilitates completion and likely would increase response rates. A Web format also would likely result in lower administration costs, eliminating several costs associated with pen and paper administration (e.g., copying/mailing, tracking, data entry). For nursing homes where Web-based administration is not feasible, the current formatting of the expanded survey (in Appendix D) facilitates pen and paper completion.

Facility administrators (or their delegates), in combination with facility Information Systems officers if available are the recommended respondents for the expanded survey. The expanded survey could be fielded by various long-term care industry stakeholder groups (e.g., national provider associations or their state affiliates; corporations; even individual buildings) seeking an in-depth understanding of the use of HIT applications among targeted nursing homes. It was noted at the September 2008 TEP meeting that AHCA has a foundation that might consider fielding such a survey, particularly if additional support could be obtained (e.g., through The Commonwealth Fund). While surveys administered by provider groups or other long-term care stakeholders tend to have lower response rates than those fielded by the NCHS and may be subject to respondent bias (i.e., nursing homes who are members of the provider group may adopt HIT/EHR at higher rates than the industry as a whole), this information could be very valuable in assisting industry stakeholders in assessing specific patterns of use of HIT in nursing homes.

VI. PILOT TESTING

The surveys presented in this report are the result of rigorous developmental activities that integrate the expertise and experience of HIT, measure development, and long-term care experts represented on the project's TEP. Before widespread administration, we recommend a pilot test of the survey questions and administration methods. Pilot testing with a small sample of nursing home respondents will provide the opportunity to examine and improve the clarity of wording for question stems and response options, refine administration methods, and assess respondent burden. The core survey questions should be tested as a stand-alone, self-administered pen and paper survey to simulate administration methods that would be used if fielded with the NNHS.

The expanded survey ideally would be first pilot tested as a pen and paper survey, refined, and then tested after conversion to an electronic format. The electronic, Web-based format likely would facilitate completion for respondents as skip patterns would be triggered electronically, allowing respondents to view only the follow-up questions relevant to their core question responses.

The surveys also may be conducive to other methods of administration (e.g., telephone or in-person interviews, or possible newly developed methods). However, pilot testing of the surveys using any intended methods should occur prior to full-scale administration using those methods.

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SURVEY QUESTIONS FOR EHR ADOPTION AND USE IN NURSING HOMES

Reports Available

Literature Review and Synthesis: Existing Surveys on Health Information Technology, including Surveys on Health Information Technology in Nursing Homes and Home Health

Executive Summary	http://aspe.hhs.gov/daltcp/reports/2009/HITlitreves.htm
HTML	http://aspe.hhs.gov/daltcp/reports/2009/HITlitrev.htm
PDF	http://aspe.hhs.gov/daltcp/reports/2009/HITlitrev.pdf

Survey Questions for EHR Adoption and Use in Nursing Homes: Final Report

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SURVEY QUESTIONS FOR EHR ADOPTION AND USE IN NURSING HOMES: FINAL REPORT

Files Available for This Report

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- HTML http://aspe.hhs.gov/daltcp/reports/2010/EHRques.htm
- PDF http://aspe.hhs.gov/daltcp/reports/2010/EHRques.pdf

*APPENDIX A. Literature Review and Synthesis: Existing Surveys on Health Information Technology
- HTML http://aspe.hhs.gov/daltcp/reports/2009/HITlitrev.htm
- PDF http://aspe.hhs.gov/daltcp/reports/2010/EHRques-A1.pdf

* The HTML link takes the user to the original versions (HTML and PDF) of the "*Literature Review and Synthesis*". The PDF link takes the user version included when a hard copy of "*Survey Questions for EHR Adoption and Use in Nursing Homes: Final Report*" is requested.

APPENDIX B. Technical Expert Panel Review Materials and Meeting Notes
- HTML http://aspe.hhs.gov/daltcp/reports/2010/EHRques.htm#appendB
- PDF http://aspe.hhs.gov/daltcp/reports/2010/EHRques-A2.pdf

APPENDIX C. Core Survey on Use of Health Information Technology in Nursing Homes
- HTML http://aspe.hhs.gov/daltcp/reports/2010/EHRques.htm#appendC
- PDF http://aspe.hhs.gov/daltcp/reports/2010/EHRques-A2.pdf

APPENDIX D. Expanded Survey on Use of Health Information Technology in Nursing Homes
- HTML http://aspe.hhs.gov/daltcp/reports/2010/EHRques.htm#appendD
- PDF http://aspe.hhs.gov/daltcp/reports/2010/EHRques-A2.pdf