White Paper

Guidelines for Protecting and Improving the Quality of Health Care Using Electronic Health Records (EHR)

HOW TO READ THIS PAPER

Executive Summary. Background information and a strategic plan (i.e. mission, goal and objectives) for preserving and enhancing the quality of health care that occurs during the doctor-patient interaction.
Appendix A. How EHR may interfere with quality health care.
Appendix B. How EHR can improve the delivery of quality care.
Appendix C. How individual components of the EHR can be changed to enhance quality.
Appendix D. EHR requirements to protect and enhance the quality of medical care, including specific recommendations for EHR vendors and programmers.
Appendix E. How individual components of the EHR can be changed to enhance quality, including specific recommendations with annotated rationale.

Approved by the Medical Association of Georgia (MAG) Electronic Health Care Committee, September 2013
Approved by the MAG Board of Directors, October 2013

EXECUTIVE SUMMARY

Background

The federal government is promoting the widespread adoption of electronic health records (EHR) with the stated goal of improving health care delivery and decreasing health care costs. It has established an incentive program to offset the cost of EHR adoption and planned penalties for those who do not. In order to receive government incentives, physicians are required to use a government-certified Electronic Health Record (EHR) and to complete a set of data inputs known as "Meaningful Use" criteria. Vendors who chose to develop a certified EHR and then compete in the marketplace are driven by two imperatives: assist users to meet and attest to "Meaningful Use" and assist them in maximizing their billing. There are more than 1,300 certified EHR systems, many similar in their approach to "Meaningful Use" and billing, but vary greatly in their approach to quality. It is our contention that the current "Meaningful Use" criteria do little to improve the quality of care and there is concern that they may have the unintended consequence of hampering the delivery of quality care during the critical doctor-patient interaction.

Mission

The Medical Association of Georgia (MAG) supports the development and dissemination of EHR guidelines that will preserve and promote high quality medical care at the point of the doctor-patient visit. These guidelines will be termed "Medically Meaningful Use." MAG will encourage consideration and adoption of these guidelines by the American Medical Association, Health and Human Services Office of the National Coordinator (ONC), Center for Medicare & Medicaid Services (CMS), and other relevant stakeholders including developers and vendors of EHR technology.

Goal

This white paper represents a consensus of practicing Georgia physicians and was endorsed at the October 2013 MAG Board of Directors meeting. The goal of the document is to enumerate the essential components and format of an EHR ("Medically Meaningful Use") that can improve the quality of health care and address the deficiencies of "Meaningful Use" that may negatively impact the delivery of quality health care.

Objectives

- Define "Medically Meaningful Use."

  Develop a consensus on the minimum required elements of an EHR system that protect and improve quality in the delivery of health care for generalists and specialists.

- Address the issue of efficiency in the doctor-patient interaction.

  Requirements for data collection that impact a caregiver's ability to focus on the elements of the encounter that improve quality of care.

- Make recommendations that promote "out of the box" EHR functionality.

  Promote functionality by including common sense EHR guidelines that reduce the learning curve for caregivers who often have no experience in how to create patient care value using an EHR.

- Create market pressure for change.

  Use the MAG-endorsed guidelines to leverage adherence by developers and vendors to the proposed elements for the purpose of promoting quality care in its EHR products.

- Lobby relevant stakeholders for adoption of these measures.

  MAG will share the guidelines with its members and other physician stakeholder groups and organizations and propose the adoption of the guidance to major vendors doing business in Georgia and educate them about the elements of quality protection and enhancement.

Opportunity Statement

EHR has not yet fulfilled the promise of improving delivery of quality health care. Government criteria employed thus far have used a "top-down" approach (one-size-fits-all and "Meaningful Use") to attempt to improve the health of the population. However, this approach has resulted in a negative impact of this on the "bottom-up" approach of the doctor-patient interaction. MAG illustrates this unintended negative impact and proposes modifications to the criteria used in EHR development so that this technology can enhance the doctor-patient interaction to improve the delivery of quality health care.

Appendix A

How EHR may interfere with quality health care.

MAG concerns include, but are not limited to, the following:

1. Certified EHR redefine quality, emphasizing data collection rather than data synthesis.
2. Certified EHR redefine a successful office/clinic visit as the completion of EHR fields for billing and for meeting "Meaningful Use." MAG believes a successful office/clinic visit requires excellent communication with a patient (for data collection, education and support), collection of relevant information required to arrive at or support a diagnosis (including the history, physical findings and laboratory studies), and the creation of a plan for further evaluation or treatment.
3. Certified EHR require collection of large volumes of data, much of it irrelevant to the patient's medical problem. Some of this data collection may be beneficial for population studies, public health concerns, and subsequent "data mining" for analysis. However, certified EHR present a challenge for clinicians trying to care for the individual patient. The collection and inclusion of large volumes of data (some relevant to the patient and some not) may result in obfuscation of the relevant data needed to make a diagnosis and treatment plan for the individual in light of the limited time of an office/clinic visit.
4. Certified EHR have burdensome requirements that encourage the use of non-medical people for data collection, whereas clinicians are the best people to collect medical information.
5. Certified EHR emphasize discrete data fields, but digitization cannot replace thinking and accurate recording of relevant data. Discrete digital field can more easily be recorded, data-mined and queried but may lack the flexibility to record the relevant data needed for health care. Many EHR use check boxes for complex questions, resulting in a simple "yes" or "no" response. Many of these responses need further clarification to be "medically meaningful."
6. Certified EHR create a huge expense for physician practices. While the incentive program offsets some of the expense, many practices have already been through two or three EHR due to poor design and industry consolidation.
7. Certified EHR focus on "Meaningful Use" which may not represent "Medically Meaningful Use" for the individual patient.
8. Certified EHR have done little to improve communication among caregivers. They have replaced carefully considered notes designed to communicate the patient's problem and treatment with voluminous pages of clinically irrelevant information which can be instantly generated from an EHR. These often provide nothing more than an ICD-9 code to describe the patient's condition.
9. Certified EHR deemphasize the critical thinking that is required for the development of a differential diagnosis. Differential diagnosis is rarely, if ever, contemplated or discussed because the (1) EHR does not require or "reward" it (2) EHR are ill suited to recording it as it is not easily adaptable to discrete digital fields (3) EHR "Meaningful Use" inefficiencies leave little time for the data synthesis that is required for considering the differential diagnosis and (4) EHR have not adequately addressed the need for and techniques to allow free text data entry.
10. Certified EHR development and marketing emphasize the ability to meet "Meaningful Use" and to accurately code for maximum reimbursement. There is no emphasis on or reward for quality. One may distinguish an approach to improving healthcare on a population level ("top down") from improving healthcare on an individual patient ("bottom up") level. Certified EHR, under the direction of "Meaningful Use," largely address the former and may have the unintended consequence of disrupting the latter. CMS is making a concerted effort to prevent the cloning of data fields (i.e., copying data from a former visit and placing it in the current visit, sometimes without actually confirming the data.) They have also expressed concern about the ease with which the EHR may allow reporting data collection that has not been done. Physicians need to take the lead in preventing this harmful practice and recommend safeguards in the EHR.

Appendix B

How EHR can improve the delivery of quality care

MAG recognizes the tremendous potential value of EHR to improve the quality of care.

1. Replace the hand written, often illegible office/clinic visit note with one that is legible and electronically accessible.
2. Utilize discrete digital data fields when they are appropriate and do not detract from communicating clinical findings.
3. Present the required, *relevant* information to the clinician at the time of the visit.
4. Utilize algorithms, best practice guidelines, and memory assistance techniques that assure that comprehensive *relevant* data collection can be done in the course of the visit.
5. Provide *relevant* timed reminders for chronic disease or health management based on widely accepted best practice guidelines.
6. Improve prescription legibility and recording and assist with medication reconciliation.
7. Improve the detection of unsuspected drug-drug interactions.
8. Build on prior visits when relevant so comparative data is available to assess success of disease management or progression.
9. Develop and utilize diagnostic assistance, emphasizing the importance of the differential diagnosis (currently de-emphasized to the brink of extinction).
10. Require and facilitate review of all labs to improve outcomes and mitigate a common source of medical errors.
11. Prevent default/cloned values when the information has not been reviewed.
12. Automate and improve communication with other caregivers.
13. Automate and improve communication and education with patients.
14. Form the basis for a health information exchange that will make records available to all caregivers when needed.
15. Assist in the analysis of population-based metrics, public health and disease assessments, best practices, cost effectiveness and other population assessments when these goals can be achieved without compromising the office/clinic visit.

Appendix C

How individual components of the EHR can be changed to enhance quality

Overview

1. Graphic Interface. The use of an intuitive, consistent and flexible graphical user interface makes it more likely that all components of a patient visit can be accurately and efficiently recorded and then accurately and logically presented. It is essential that patient visits can be easily compared, preferably on the same screen.
2. Data Entry Mechanisms. Quality is enhanced when the time and energy spent recording the visit can be optimized. Options to view or copy prior visit information while discouraging "default" or "cloned" values is required.
3. Opening Page. Quality is improved when the physician can be presented with the critical information to promptly recall relevant issues and key clinical information.
4. History Page. Most diagnoses or assessments of disease status begin with a careful history. Clinical skill in history taking must be valued and not deemphasized by check lists, pull down tables and the use of various assistants. The history section must include the flexibility to allow for dictated or typed text, reserving the use of discrete digital data for appropriate components of the history, and as reminders to address certain issues, relevant to the patient's problems. This section will change for different types of patient encounters and should be based on the skill of the interviewer. Access to data that is related to prior visits is essential.
5. Review of Systems. A careful review of systems is essential to good patient care, but that must be balanced with relevancy and efficiency allowing enough time for the physician–patient interaction. A reasonable and relevant review of systems can be accomplished by the physician who can pick up on any signals that require further attention. Note that MAG is proposing the use of a "relevant" review of systems for a number of specialties that can be recommended to vendors.
6. Exam Page. Quality care demands a careful physical exam, and the EHR should facilitate rather than obscure this process. It must remain flexible enough to record positive and negative findings for both primary care and specialty physicians. Easy access to prior physical findings will be important for comparison.
7. Procedures. EHR can greatly improve efficiency when repetitive procedures can be organized for rapid, accurate recording allowing time for physician-patient interaction.
8. Lab. EHR can excel in this area of data collection and presentation to improve clinical relevance and trends. EHR should be able to graph laboratory data with any clinical parameter to assess disease progression or response to treatment.
9. Impression. The impression section has been deemphasized in certified EHRs for several reasons (i.e., the difficulty of placing this kind of data in discrete data fields, inability of many physicians to type, the expense of dictation, and the lack of incentive to make a diagnosis. There is no billing or "Meaningful Use" value to actually making the right diagnosis). Detailed data collection does not improve quality unless it is relevant to the patient and accessible to the physician to assist in making the right diagnosis. The EHR should emphasize and facilitate the use of the "differential diagnosis."
10. Plan. There must be flexibility for different kinds of patients and specialties to deal with this section where a single problem, multiple separate problems, or multiple interacting problems may be relevant.

Appendix D

EHR requirements to protect and enhance the quality of medical care

Specific recommendations to be provided to EHR vendors and programmers

1. Graphic Interface

The use of an intuitive, consistent and flexible graphic user interface makes it more likely that all components of a patient visit can be accurately and efficiently recorded and then accurately and logically presented. It is essential that the patient can be easily compared, preferably on the same screen.

a. Easy, intuitive, consistent navigation.[1]
b. Ability to open several windows at once.[2]
c. Modifiable and flexible.[3]

2. Data Entry Mechanisms

Quality is enhanced when the time and energy spent recording the visit can be optimized. Options to view or copy prior visit information while discouraging "default" or "cloned" values is required.

a. Preference and flexibility[4]
b. Typing
c. Tablet
d. Digital "pen"
e. Dictation/Dragon
f. Other
g. Scanning – efficient process (i.e. bar codes, name recognition software).[5]
h. Pre-population from prior visits.[6]
    1) Ability to utilize last IMPRESSION AND PLAN (dated recording).
    2) Ability to choose the relevant previous visit (i.e., multispecialty group EHR, new problems)
    3) Ability to flip back through prior visits for comparison and updating (i.e., IMPRESSION and PLAN).
i. Visually concise "pages" for each conceptual component of the evaluation (i.e., OPENING PAGE, HISTORY PAGE, REVIEW OF SYSTEMS PAGE, PHYSICAL EXAM PAGE).[7]

3. Opening Page

Quality is improved when the physician can be presented with the critical information to prompt recall of relevant issues and key clinical information. Critical, visible information for an office visit includes:[8]

a. Demographic – name, sex, age, date of birth, chart number, contact information
b. Reason for visit/chief complaint
c. Vital signs[8a]
d. Ability to choose the parameter – BP, P, RR, T, WT, head circ, growth chart, O2 sat, etc.
e. Ability to see graphically over time
f. Date of last visit[9]
g. Last weight or change in weight[10]
h. Name of referring and treating physicians[11]
i. Problem list[12]
    1) Basic view – ICD-9, modifiable description, active or inactive, managed here or elsewhere

2) Expanded view – date of onset, optional notations (i.e. degree of certainty, severity, PE, activity, MHAQ, AHA classification) in free text or list table that can be created by user
3) Can sort by name, active or inactive (default to active first), date of onset, "managed here"
4) Ability to move problems to PMH (i.e., simple right click)
5) Link to PMH[13]

j. Medications
1) Current medications (i.e., the ones patient is actually taking at time of visit)
2) Medication allergies – includes manifestations if known
3) Medication tolerance[14]
4) Indicate which meds are prescribed here (i.e., asterisk, bold, underline, color, etc.).
5) Create link to prior medications with reason for discontinuation if relevant[15]
6) Notation of new medications or adjusted medications after today's visit[16]

k. Link to
1) Last impression
2) Last plan
3) Test results since last visit

4. <u>History Page</u>

Most diagnoses or assessments of disease status begin with a careful history. Clinical skill in history taking must be valued and not deemphasized by checklists and pull-down tables. The history section must include the flexibility to allow for dictated or typed text, reserving the use of discrete digital data for appropriate components of the history and as reminders to address certain issues. This section will be different for different types of patient encounters based on the skill of the interviewer. Access to data related to prior visits is essential.

a. Must make past visit history fields easily accessible within three mouse clicks[1]
b. Chief complaint – text field[2]
c. OPTIONAL – "Reason for visit" text field. This may be different from the chief complaint[3]
d. OPTIONAL – "Patient sentiment" – recording patient's overall perception of how they're doing (i.e., "fine", "miserable", etc.)[4]
e. HISTORY OF PRESENT ILLNESS
1) Provide options for either free text (typed or dictated or "Dragon") or discrete digital data list of elements of HPI for fixed text or numeric entry[5]
2) OPTIONAL – provide a reminder guide that includes the requisite elements of an HPI. This could appear in a pop-up window or other technique and might include:[6]
- Location
- Onset
- Duration
- Timing
- Quality
- Context
- Severity
- Associated signs and symptoms
- Modifying factors

3) OPTIONAL – ability to populate discrete digital data fields from free text.[7]
4) A mechanism to allow for multiple components in the HPI which can be recorded logically in separate sections such as HPI_1, HPI_2, etc. This may or may not be linked to a problem list.[8]
5) Provide a location for REVIEW OF MEDICAL EVENTS since last visit (i.e., illness, surgery, hospitalizations)

5. Review of Systems (ROS)

A careful review of systems is essential to good patient care but that must be balanced with relevancy and efficiency allowing enough time for the physician–patient interaction. A reasonable and relevant review of systems can be accomplished by the physician who can pick up on any signals that require further attention. Note that the committee has developed a "relevant" review of systems for a number of specialties which can be recommended to vendors.

a. REQUIRED – Availability of disease/specialty specific review of systems developed using the top five diagnoses (see spreadsheet).[1]
b. REQUIRED – Availability of comprehensive ROS (i.e., for comprehensive physical exam or "health maintenance" evaluations, or atypical symptoms in a disease specific list).[2]
c. REQUIRED – A mechanism for highlighting positive ROS.[3]
d. REQUIRED – ROS needs to be customizable, identifiable and retrievable depending on medical field, purpose of visit, and diagnoses being managed.[4,5]

6. Exam Page

a. Quality care demands a careful physical exam, and the EHR should facilitate rather than obfuscate this process. It must remain flexible enough to record positive and negative findings for both primary care and specialty physicians. Easy access to prior physical findings will be important for comparison. REQUIRED – flexibility[1] to allow any care provider to design a relevant exam page. To follow the requirements of E&M coding, basic options need to include:

   Categorized by organ systems:

   1) General
   2) Skin
   3) Eyes
   4) ENT
   5) Respiratory
   6) Cardiovascular
   7) Gastrointestinal
   8) Musculoskeletal
   9) Neurologic
   10) Psychiatric
   11) Hematologic/lymphatic/immunologic

   Categorized by body areas:

   1) Head
   2) Neck
   3) Chest
   4) Abdomen
   5) Genitalia, groin, buttocks
   6) Back
   7) Left arm
   8) Right arm
   9) Left leg
   10) Right leg

b. REQUIRED – The ability to develop exams that are relevant to specialties[2] (i.e., detailed cardiac, musculoskeletal, ENT, OB exams).
c. REQUIRED – A mechanism to allow a real-time comparison with the last examination.[3] Examples might include side-by-side visual comparison, cut and paste technology, or "overwrite" capability with fields pre-populated from prior exam.
d. REQUIRED – Ability to highlight changes in physical findings.[4]

7. Procedures

Efficiency matters. EHR can greatly improve efficiency when repetitive procedures can be organized for rapid, accurate recording allowing time for physician and patient interaction.

a. REQUIRED – simple digitized version for common office procedures with room for text comments.[1]
b. OPTIONAL – flexibility to create simple procedure notes.[2]

8. Labs

EHR can excel in this area of data collection including presentations to improve clinical relevance and trends. EHRs should be able to graph laboratory data with any clinical parameter to assess disease activity or response to treatment.

a. REQUIRED – The ability (from the EHR side) to download discrete digital data from major laboratories.[3]
b. REQUIRED – Graphic and longitudinal presentations.[4]
c. REQUIRED – The ability to link laboratory results by date to most clinical parameters (i.e., vital signs, medication name and dose, and physical findings).[5]
d. REQUIRED – All labs need to be reviewed as they return
    1) Alert values must be brought to attention of the physician for immediate disposition.
    2) Lab results must link seamlessly with the most recent visit notes so they can be reviewed in the context of the visit, not as an isolated list of values.[5a, 5b]

9. Impression

The impression section has been deemphasized in certified EHR for several reasons (i.e., the difficulty of placing this kind of data in discrete data fields, the inability of many physicians to type text, the expense of dictation, the ease of clicking on an ICD-9 code, and the lack of an incentive to make a diagnosis). The EHR is well suited to assist with data collection and data presentation, but data synthesis is the key to diagnostic and therapeutic excellence. The IMPRESSION should build on current and past observations.

a. REQUIRED – Must make past visit IMPRESSION fields easily accessible within three mouse clicks.[6]
b. REQUIRED – Side-by-side, "overwrite", or cut and paste capability with last IMPRESSION.[7]
c. IMPRESSION for each active problem being managed.[8,9]

10. Plan

There must be flexibility for different kinds of patients and specialties to deal with this section where a single problem, multiple separate problems, or multiple interacting problems may be relevant.

a. REQUIRED – Flexibility to record as preferred.[10]
b. Plan can be a combined section for all changes and recommendation.
c. Plan can be separate items, linked to each active problem being addressed.
d. Plan can include a "standardized" list of choices when appropriate.

Appendix E

EHR requirements to protect and enhance the quality of medical care

Specific recommendations with annotation to document rationale

1. Graphic Interface

The use of an intuitive, consistent and flexible graphic user interface makes it more likely that all components of a patient visit can be accurately and efficiently recorded and then accurately and logically presented. It is essential that patient visits can be easily compared, preferably on the same screen.

a. Easy, intuitive, consistent navigation.[1]
b. Ability to open several windows at once.[2]
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2. Data Entry Mechanisms

Quality is enhanced when the time and energy that is spent recording the visit can be optimized. Options to view or copy prior visit information while discouraging "default" or "cloned" values is required.

a. Preference and flexibility[4]
b. Typing
c. Tablet
d. Digital "pen"
e. Dictation/Dragon
f. Other
g. Scanning – efficient process (i.e., bar codes, name recognition software).[5]
h. Pre-population from prior visits.[6]
    1) Ability to utilize last IMPRESSION AND PLAN (dated recording).
    2) Ability to choose the relevant previous visit (i.e., multispecialty group EHR, new problems).
    3) Ability to flip back through prior visits for comparison and updating (i.e., IMPRESSION and PLAN)
i. Visually concise "pages" for each conceptual component of the evaluation (i.e., OPENING PAGE, HISTORY PAGE, REVIEW OF SYSTEMS PAGE, PHYSICAL EXAM PAGE).[7]

1. Consistency throughout for ease of management.
2. This is for comparison to prior patient encounters to assist with management of chronic disease.
3. One size does not fit all and flexibility is essential to practice and patient variability.
4. Maximum flexibility for user preferences, type of practice, and patient population.
5. To become "paperless," and in the absence of federal guidelines to address interoperability and information sharing, there must be time efficient and accurate processes to enter outside, non-EHR information.
6. Easy comparison to prior visits and data are essential for quality care when managing diseases over long terms.

7. The EHR needs to follow the same "logic" that was developed for paper records that are designed to "set the stage" (remind caregiver of basics such as problem list, age, how recently seen, etc.)

- Acquire a current or interval history (HPI)
- Search for relevant symptoms (ROS)
- Do a relevant physical exam (PE)
- Review labs and imaging (LAB)
- Synthesize the data into an IMPRESSION(s)
- Use all the above to develop a PLAN

3. Opening Page

Quality is improved when the physician can be presented with the critical information to prompt recall of relevant issues and key clinical information. Critical, visible information for office visit includes[8]

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e. Ability to see graphically over time
f. Date of last visit[9]
g. Last weight or change in weight[10]
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    3) Can sort by name, active or inactive (default to active first), date of onset, "managed here"
    4) Ability to move problems to PMH (i.e., simple right click)
    5) Link to PMH.[13]
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    1) Current medications (i.e., the ones patient is actually taking at time of visit)
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    6) Notation of new medications or adjusted medications after today's visit.[16]
k. Link to
    1) Last impression
    2) Last plan
    3) Test results since last visit

8. EHR can excel in presenting the noted data to better see the whole picture, anything that presents pertinent information with a clear graphical user interface and trends improves quality(i.e., EHR can avoid a "one size fits all" approach by allowing flexible "vital signs" which may differ for a pulmonologist, pediatrician, obstetrician, internist).
9. Critical for any disease management.
10. Obvious benefit without having to find old values.
11. Quality of care must include interaction with other physicians involved in the total care of the patient. The trend to "specialized" care which doesn't consider the total patient impairs quality and promotes duplication and the EHR need to address this. Until a universal health information exchange is available, auto-fax, electronic transfer, cloud based records and land mail must be utilized to transmit relevant information to other caregivers. This should default to send to all relevant caregivers with the "opt-out" option of removing names. It should not require active recollection of who might need records once the relevant caregivers have been identified.

12. Problem list can be improved in EHR to allow flags or check boxes that identify features which help a physician manage the large amount of information that may be present as noted including who manages, certainty of diagnosis, levels of severity ("mild, mod, severe, AHA CLASS 2, GLEASON GRADE X, breast CANCER notations, functional level by MHAQ," etc).
13. Usually PMH is usually of secondary importance during a visit, but it should be easy to access.
14. Medication intolerance for a practicing physician is just as important as allergy when choosing medications to treat. This is different from allergies which have "class" implications and potential life-threatening implications.
15. In long-term management of disease, it is essential to have access to prior meds with outcome (i.e., optionally for rheumatology prior RA remittive treatments, for PCP – antihypertensive, pain meds, for cardiology – anti arrhythmics, etc.).
16. A simple flag that a new med was prescribed today is very helpful on the next visit where it should be prominently displayed as a new medication, thereby reminding the physician to discuss its effect.

4. History Page

Most diagnoses or assessments of disease status begin with a careful history. Clinical skill in history taking must be valued and not deemphasized by check lists and pull-down tables. The history section must include the flexibility to allow for dictated or typed text, reserving the use of discrete digital data for appropriate components of the history and as reminders to address certain issues. This section will be different for different types of patient encounters and based on the skill of the interviewer. Access to prior visits is essential.

a. Must make past visit history fields easily accessible within three mouse clicks.[1]
b. Chief complaint – text field[2]
c. OPTIONAL "Reason for visit" – text field. This may be different from the chief complaint.[3]
d. OPTIONAL "Patient sentiment" – recording patient's overall perception as to how they're doing (i.e., "fine," "miserable")[4]
e. HISTORY OF PRESENT ILLNESS
    1) Provide options for either free text (typed or dictated or "Dragon") or discrete digital data list of elements of HPI for fixed text or numeric entry.[5]
    2) OPTIONAL – provide a reminder guide that includes the requisite elements of an HPI this could appear in a pop-up window or other technique and might include:[6]
        - Location
        - Onset
        - Duration
        - Timing
        - Quality
        - Context
        - Severity
        - Associated signs and symptoms
        - Modifying factors
    3) OPTIONAL – ability to populate discrete digital data fields from free text.[7]
    4) A mechanism to allow for multiple components in the HPI that can be recorded logically in separate sections such as HPI_1, HPI_2, etc. This may or may not be linked to a problem list.[8]
    5) Provide a location for REVIEW OF MEDICAL EVENTS since last visit (i.e., illness, surgery, hospitalizations)

1. Must conveniently allow comparison to prior visit(s) (i.e., by comparing windows side by side (closing one window and opening another is (at best) inconvenient and (at worst) promotes errors in recalling complex data).
2. This is good medicine. E&M requires this as well.

3. Often differs from CC (reason for visit may be "RA on Methotrexate" but chief complaint may be cough, low back pain, depression, or recent admission for chest pain).
4. Useful for comparison to prior visit and sets tone of visit.
5., 6., 7. Discrete digital data is helpful for data mining and for assistance in providing elements of HPI that may be required. However, carries none of the contextual elements of an HPI that is essential to good history taking and doesn't work for multiple problems. We need to provide flexibility for entry either way to both "assist" and "allow" good history taking. Acknowledge E&M requirements.
8. Multiple problems are the rule versus the exception in medical care. EHR should encourage a logical approach to relevant active problems (i.e. if there is more than one active problem that requires a history, each HPI issue can be addressed in its own section but all issues should be "front and center" when viewing the whole patient due to the impact of the multiple problems on the total patient (i.e., a patient may present for a total knee replacement but may have an ischemic toe, cellulitis and diabetes out of control that will impact the decision making process).

5. Review of Systems (ROS)

A careful review of systems is essential to good patient care but that must be balanced with relevancy and efficiency allowing enough time for the physician–patient interaction. A reasonable and relevant review of systems can be accomplished by the physician who can pick up on any signals that require further attention. Note that the committee has developed a "relevant" review of systems for a number of specialties which can be recommended to vendors.

a. REQUIRED – Availability of disease/specialty specific ROS, developed using the top five diagnoses (see spreadsheet).[1]
b. REQUIRED – Availability of comprehensive ROS (i.e., for comprehensive physical exam or "health maintenance" evaluations, or atypical symptoms in a disease specific list).[2]
c. REQUIRED – a mechanism for highlighting positive ROS.[3]
d. REQUIRED – ROS needs to be customizable, identifiable and retrievable depending on medical field, purpose of visit, and diagnoses being managed.[4,5]

1. Today's EHR attempt to use a "one size fits all" approach that does not allow one to focus on relevant data collection thereby decreasing efficiency and hiding relevant data within irrelevant data. Simply providing an EHR as "tabula rasa" and allowing physicians to create their own ROS is not adequate as it requires each to invent this while struggling to learn the whole EHR. Providing an optional "typical" disease or specialty specific ROS (as developed by this committee using the top five diagnoses in each area of care) would be a way for caregivers to address this area on day one of EHR adoption. The committee has developed a "focused/relevant" review of systems for many specialties. The EHR must still have flexibility to modify these "focused" ROS to allow for different needs in different practices. The complete ROS should be easily accessible.
2. "Health maintenance" visits without an identified disease process might default to the complete ROS.
3. Seeing the positive findings in the ROS when completing the impression section will help the physician when they are attempting to synthesize the data into a proper diagnosis.
4. As a practical issue, each ROS can address the adequacy of "bullet points" required for E&M coding, adding additional questions or leaving some blank depending on the relevancy of the ROS to the clinical problem.
5. The committee notes the inequity that may occur when an EHR records ROS bullet points when the data is noted in the ROS section but not when the same data is recorded in the HPI section, where it may be most logical to place it. To minimize data duplication, solutions to this inequity would be encouraged – such as "text to digital data" processes.

6. Exam Page

a. Quality care demands a careful physical exam and the EHR should facilitate rather than obfuscate this process. It must remain flexible enough to record positive and negative findings for both primary care and specialty physicians. Again, easy access to prior physical findings will be important for comparison. REQUIRED flexibility[1] to allow any care provider to design a relevant exam page. To follow the requirements of E&M coding, basic options need to include:

   Categorized by organ systems:
   1) General
   2) Skin
   3) Eyes
   4) ENT
   5) Respiratory
   6) Cardiovascular
   7) Gastrointestinal
   8) Musculoskeletal
   9) Neurologic
   10) Psychiatric
   11) Hematologic/lymphatic/immunologic

   Categorized by body areas:
   1) Head
   2) Neck
   3) Chest
   4) Abdomen
   5) Genitalia, groin, buttocks
   6) Back
   7) Left arm
   8) Right arm
   9) Left leg
   10) Right leg

b. REQUIRED – The ability to develop exams relevant to specialties[2] (i.e., detailed cardiac, musculoskeletal, ENT, OB exams).
c. REQUIRED – A mechanism to allow real-time comparison with the last examination.[3] Examples might include side-by-side visual comparison, cut and paste technology, or "overwrite" capability with fields pre-populated from prior exam.
d. REQUIRED – Ability to highlight changes in physical findings.[4]

1. Some physicians may wish to create a relevant physical exam that is disease or specialty specific. While one could pick and choose from the total exam, a “relevant” exam might serve as a reminder to “always” examine and record findings in some disease states that might otherwise be overlooked (i.e., a cardiologist may wish to have JVD or edema on the list, an endocrinologist, the thyroid exam or examination for foot ulcers, a rheumatologist, parotid gland enlargement or palpation of the Achilles tendon.) This “focused” exam may improve quality of care by having the EHR serve as a reminder to address these areas. Again, there can attention to E&M coding requirements based on the relevance of these areas.
2. Some specialties prefer to have a detailed exam section that addresses their area such as a pelvic exam, joint exam, and skin exam.
3.,4. EHR offer the ability to highlight changes in exam both at the time it is recorded and later when data synthesis occurs, in the impression section.

7. Procedures

Efficiency matters. EHR can greatly improved efficiency when repetitive procedures can be organized for rapid, accurate recording, allowing time for physician and patient interaction.

a. REQUIRED – simple digitized version for common office procedures with room for text comments.[1]
b. OPTIONAL – flexibility to create simple procedure notes.[2]

8. Labs

EHR can excel in this area of data collection and presentation to improve clinical relevance and trends. EHRs should be able to graph laboratory data with any clinical parameter to assess disease activity or response to treatment.

a. REQUIRED – The ability (from the EHR side) to download discrete digital data from major laboratories.[3]
b. REQUIRED – Graphic and longitudinal presentations.[4]
c. REQUIRED – The ability to link laboratory results by date to most clinical parameters (i.e. vital signs) medication name and dose and physical findings.[5]
d. REQUIRED – All labs need to be reviewed *as* they return
    1) Alert values must be brought to the attention of the physician for immediate disposition.
    2) Lab results must link seamlessly with the most recent visit notes so they can be reviewed in the context of the visit and not as an isolated list of values.[6, 7]

1. Example "Joint injection," the elements can be entered as discrete digital data to create a logical, textual note of the procedure.
- Preparation of site
- Name of joint
- Left or right
- Procedure (aspiration, injection, both)
- Volume of fluid
- Appearance of fluid
- Fluid evaluation (i.e. sent to lab, examined for crystals and result…)
- Injection name and dose
- Post procedure directions

2. Flexibility to create any recurring procedure note similar to above.
3. MAG suggests this may require standardization across the industry.
4. Essential for seeing trends and outliers in lab values.
5. Essential for managing chronic disease, assessing adequacy of treatment, and providing alerts for dangerous trends.
6. Seeing the labs in the absence of the recent note does not allow contextual evaluation of the significance of the results. Laboratory review should occur as soon as labs are completed to look for critical values that need immediate attention. In addition, non-critical laboratory values need to be reviewed in the context of the impression and plan to confirm or modify the IMPRESSION or PLAN or to address any new abnormalities before "signing off" on the chart. Failure to review and address laboratory results has been a major source of poor outcomes and malpractice suits. The EHR must address and improve this aspect of quality.
7. The reality is that labs return at different times. Immediate attention is needed for critical values as they return and here a simple listing of results is an adequate screen. When all labs have returned, the office record must be available to evaluate the lab results in the context of the office note. A mechanism for a simple linkage to the note (i.e., right click) will allow the physician to efficiently review the labs, taking immediate action when necessary for critical values, and completing and signing off on the office note when all results are back.

9. Impression

The impression section has been deemphasized in certified EHR for several reasons (i.e., the difficulty of placing this kind of data in discrete data fields, the inability of many physicians to type text, the expense of dictation, the ease of clicking on an ICD-9 code and the lack of an incentive to make a diagnosis). EHR is well suited to assist with data collection and data presentation, but data synthesis is the key to diagnostic and therapeutic excellence. The IMPRESSION should build on current and past observations.

a. REQUIRED – Must make past visit IMPRESSION fields easily accessible within three mouse clicks.[1]
b. REQUIRED – Side-by-side, "overwrite," or cut and paste capability with last IMPRESSION.[2]
c. IMPRESSION for each active problem being managed.[3,4]

1. EHR must make the ease of opening past notes as simple in the EHR format as it is in the paper format.
2. Essential to compare prior notes with current visit. Previous text or discrete data may be used, but strategies to discourage wholesale or inappropriate "cut and paste" needs to be developed. One example might be a time stamp on entering certain fields. The MAG strongly discourages the use of inappropriate "cut and paste" and will not endorse any mechanism that reports findings that were not made during a visit.
3. Each active problem being addressed in this encounter needs an IMPRESSION for assessment of status. While drop down or "pre-written" options may be used, textual discussion is best. A flexible list of elements to be addressed (i.e. "improved, unchanged, worsened", "activity mild, moderate, severe"), can be made available as a reminder (i.e. as a right click or drop down list). Any strategies to encourage and simplify meaningful textual discussion would be beneficial.
3. EHR vendors must support the clinician in developing an IMPRESSION section that has clinical relevancy. The use of an ICD-9 code or restatement of the chief complaint is not adequate and represents a detriment to quality care. The overwhelming burden of data collection has redirected the patient-physician encounter from "data synthesis" to "data collection". The EHR can assist quality care by presenting the abnormal findings in ROS, new symptoms, abnormal physical exam or changed physical findings. Preferably, these can be identified by the EHR earlier in the course of the encounter, so they are available to the clinician at the time of addressing the "IMPRESSION" section (i.e. new shortness of breath, new rales, new S3, new edema, increased orthopnea, the elements which would allow the doc to conclude "worsening heart failure.)" This will encourage physicians to address each of these abnormalities (i.e., to be discarded as unimportant or to help develop a differential diagnosis or to assess the patient's disease status).

10. Plan

There must be flexibility for different kinds of patients and specialties to deal with this section where a single problem, multiple separate problems, or multiple interacting problems may be relevant.

a. REQUIRED – Flexibility to record as preferred.[10]
b. Plan can be a combined section for all changes and recommendation.
c. Plan can be separate items, linked to each active problem being addressed.
d. Plan can include a "standardized" list of choices when appropriate.

10. Acknowledging that there are different ways physicians may used the PLAN section, the EHR should allow options that reflect the thought process and type of patients that are seen by each physician. Some prefer a "combined" plan for all problems as the treatments and recommendations may address several different diagnoses (i.e., weight loss for heart failure, osteoarthritis and diabetes or increased diuretic and leg elevation to treat CHF and cellulitis). Others may wish to place a PLAN next to each item in the PROBLEM list. Flexibility in EHR is essential to allowing the physician to follow the logical thought process for that situation.