The Centers for Medicare and Medicaid Services Electronic Health Records for Hospitals

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Abstract

The Centers for Medicare and Medicaid Services (CMS) Electronic Health Records (EHR) incentive program for hospitals is described with respect to the requirements to receive the incentive payments, how to calculate the amount, and the pertinent time frames. Comparisons between the CMS EHR and Picture Archiving and Communication Systems (PACS) are presented. The hallmarks of successful computerized health records are reviewed.

INTRODUCTION

The American Recovery and Reinvestment Act of 2009 provided for incentive payment programs when a certified Electronic Health Record (EHR) meets meaningful use criteria (MUC) as defined by the Centers for Medicare and Medicaid Services (CMS).There is a program for Eligible Professionals (EPs) and a corresponding program of incentive payments for hospitals. Most physicians have focused on requirements to receive incentive payments for their own practices. This paper describes the CMS meaningful use program for hospitals and compares attributes of the CMS EHR with Picture Archiving and Communication Systems (PACS).

For both hospitals and EPs, the three main components of the EHR as legislated by Congress and implemented by CMS are as follows:[1]

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- The use of a certified EHR in a meaningful manner, such as e-prescribing.
- The use of certified EHR technology for electronic exchange of health information to improve quality of health care.
- The use of certified EHR technology to submit clinical quality and other measures.

The differences between the programs revolve around how the incentive payments are calculated, the time frames that must be met to receive the incentives, and the MUCs themselves.

CALCULATION OF THE INCENTIVE PAYMENT AND TIME FRAMES

To calculate the incentive payment one needs to know the product of the base amount, the Medicare share, and the transition factor. The base amount is $2,000,000 plus $200 times the number of annual admissions between 1,150 and 23,000. This payment of $200 per admission does not start until the

1,150th admission and ends at 23,000 admissions. The Medicare share is a fraction. The numerator is the number of Part A and C Medicare days and the denominator is the number of hospital days minus a factor based on the amount of charity care the hospital renders. This charity-based adjustment will decrease the denominator, consequently, improving the incentive payment. The transitional factors for hospitals starting participation in FY 2011, 2012, or 2013 is 1.0 for the first year of participating, 0.75 for the second, 0.50 for the third, and 0.25 for the fourth and last year. If a hospital delays in participating until FY 2013, they would still receive the full four years of reimbursement although the payments would start later. If a hospital does not start participating until FY 2014 they will only receive 0.75 for year one, 0.50 for year two, and 0.25 for the final year. If the hospital does not start until FY 2015, the first year transition factor will be 0.50. There will be no financial incentive for hospitals that begin to participate after 2015 and non-participating hospitals will face increasing financial penalties if they continue not to participate. CMS has a tip sheet[2] describing the calculation with hypothetical scenarios. If a hospital treats Medicaid patients, it may be eligible to receive additional payments beyond those previously described. A summary of the number of hospitals that have received Medicare or Medicaid eligibility payments as of January 2012 is also available at the CMS website[3] and the number of Delaware hospitals listed is two.

HOSPITAL MUCS

There are a total of 24 MUCs, consisting of 14 core MUCs and 10 optional criteria. To qualify for the incentive payment, the hospital needs to satisfy all 14 core MUCs and five optional objectives from the list of ten. On the CMS EHR incentive program page[4] a list of the objectives allows the user to access the details of the metric, such as specific definitions, how to calculate the numerator and denominator when required, and exclusion criteria if applicable.

The 14 required MUCs:

1. Use Computerized Physician Order Entry (CPOE) for medication orders directly entered by any licensed health care professional who can enter orders into the medical record per state, local, and professional guidelines.
2. Implement drug-drug and drug-allergy interaction checks.
3. Maintain an up-to-date problem list of current and active diagnoses.
4. Maintain active medication list.
5. Maintain active medication allergy list.
6. Record all of the following demographics: (A) preferred language; (B) gender; (C) race; (D) ethnicity; (E) date of birth; and (F) date and preliminary cause of death in the event of mortality in the eligible hospital.
7. Record and chart changes in the following vital signs: (A) height; (B) weight; (C) blood pressure; (D) calculate and display body mass index (BMI); and (E) plot and display growth charts for children 2–20 years, including BMI.
8. Record smoking for patients 13 years old or older.
9. Report hospital clinical quality measures to CMS or, in the case of Medicaid-eligible hospitals, the states.
10. Implement one clinical decision support rule related to a high priority hospital condition along with the ability to track compliance with that rule.
11. Provide patients with an electronic copy of their health information (including diagnostic test results, problem list, medication lists, medication allergies, discharge summary, and procedures) upon request.
12. Provide patients with an electronic copy of their discharge instructions upon request at time of discharge.
13. Capability to exchange key clinical information (for example, problem list, medication list, medication allergies, and diagnostic test results) among providers of care and patient authorized entities electronically.
14. Protect electronic health information created or maintained by the certified EHR technology through the implementation of appropriate technical capabilities.

The ten optional MUCs, from which the hospital needs to select five:

1. Implement drug formulary checks.
2. Record advance directives for patient 65 years old or older.
3. Incorporate clinical lab test results into EHR as structured data.
4. Generate lists of patients by specific conditions to use for quality improvement, reduction of disparities, research, or outreach.
5. Use certified EHR technology to identify patient-specific education resources and provide those resources to the patient if appropriate.
6. The hospital that receives a patient from another setting of care or provider of care or believes an encounter is relevant should perform medication reconciliation.
7. The hospital that transitions their patient to another setting of care or provider of care or refers their patient to another provider of care should provide a summary care record for each transition of care or referral.
8. Capability to submit electronic data to immunization registries or immunization information systems and actual submission according to applicable law and practice.
9. Capability to submit electronic data on reportable lab results (as required by state or local law) to public health agencies and actual submission according to applicable law and practice.
10. Capability to submit electronic syndromic surveillance data to public health agencies and actual submission according to applicable law and practice.

DISCUSSION OF THE MUCS

If there is a theme that permeates the MUCs, it is communication. All of the MUCs have this component as either a primary or a secondary element. This is not surprising as the principal goal of an effective EHR is to improve patient safety and outcomes. When an unfavorable incident occurs, a communication issue is often found as one of the fundamental factors contributing to the event. From January 1, 2009, thru the third quarter of 2011, a total of 2,752 sentinel events were evaluated by The Joint Commission and communication was a significant causative factor in 1,822 of them.[5]

Effective communication can improve outcomes for patients with chronic conditions, such as diabetes, by consistently educating individuals about what they need to do to contribute to their well-being. The EHR can consistently generate for all patients discharge instructions covering salient points, such as activities, diet, follow-up appointments, whom to call if a problem arises, and providing medication information in non-technical language.

Medication use is another theme of the MUCs. CPOE, allergy lists, medication lists, medication and allergy interaction checks, formulary checks, medication reconciliation lists, and vaccine registries all directly relate to drug usage. Other MUCs such as providing information to ongoing providers, patient education, and discharge instructions have medication information as part of their elements. This emphasis on medication usage reflects a considerable body of literature that suggests medication errors are not rare events, can cause patient harm, and are largely preventable. The EHR is by no means a final answer to preventing medication misadventures and there are errors that are unique to CPOE and the EHR. However, CPOE is less error prone than a handwritten ordering system and, as CPOE and e-prescribing become more refined and widespread CPOE errors will become less common. The Leap Frog Group[6] has a web-based tool that hospitals can use to evaluate the quality of their CPOE system for error detection.

The CMS certification criteria includes a description of the digital format the MUCs must meet to receive the incentive payments. This configuration is required so that data can be retrieved and shared over time within the hospital's EHR and be recognizable by compliant EHRs of other health care providers. This structured format also facilitates efficient transmission of benchmarking information. All of the MUCs need to operate in a Health Insurance Portability and Accountablity Act (HIPAA) compliant environment, yet still allow those with legitimate requirements for the data to be able to access it. The technical details regarding the MUCs are available from Health Level Seven International (HL7), a not-for-profit, American National Standards Institute (ANSI)-accredited organization whose stated goal is "..to provide a comprehensive framework and related standards for the exchange, integration, sharing, and retrieval of electronic health information that supports clinical

practice and the management, delivery, and evaluation of health services."[7]

THE PACS AND CMS EHR

Better communication is the fundamental advantage of an effective EHR over paper records. The EHR should be able to rapidly and accurately capture germane information from a variety of sources regardless of location without including extraneous, useless information. Then the EHR needs to be able to present the data to health care providers quickly and in a useful format whether it is lab values, test results, or textural information such as consults or a history and physical exam. Prompts such as order sets, drug references, and best practice guideline references can be built into the system and be available but not intrusive.

Picture Archiving and Communication Systems (PACS) are a specific type of EHR and as their name implies, communication is one of their fortes. PACS can rapidly capture information from all imaging sources. The digital image is immediately available with essentially no work once the image is captured. In the old system, film had to be developed and sent to the radiologist for viewing. PACS images can be viewed locally or remotely and, as they are digital, can easily be magnified or manipulated for optimal interpretation. The radiologist's reading is quickly archived and sometimes the interpreter's reading can be heard as an audio file. Images and their analysis can be disseminated and viewed at different locations simultaneously whether for patient care or education. When patients come back for repeat studies, the previous images can be rapidly downloaded and are available for comparison. If a patient needs a copy of their findings, it can be burned onto a DVD or the images can be sent via the internet – a huge improvement over copying films and hand carrying or mailing them. Once physicians realized the benefits of PACS, these systems were quickly embraced by the profession and proved their value over X-rays, film storage folders, and typed dictation reports. EHRs are readily accepted by health care providers when there are real gains in both reality and the eyes of the user. A nurse should not have to hand type vital signs into the EHR database; this information should flow directly from the digital cuff and thermometer to the patient's record. Anesthesiologists whose machines automatically plot out vitals every few minutes do not want to go back to the hand written system.

PACS provide more value when all the appropriate players have access to the system, and the EHR will work best when both hospital-based and office-based physicians can quickly and seamlessly access appropriate patient information in a meaningful format without extraneous data. Including other appropriate institutions and health care providers in the communication net will also add value.

PACS can also be used for evaluating the quality of care and services such as measuring turnaround times, evaluating a new physician, or documenting that the contracted after-hours imaging service is meeting expectations. The structured EHR should also allow one to validate good patient care, or if there is an issue, the EHR should be able to help pinpoint problematic areas quicker and more systematically than paper records. As an example, when compared to paper charts, EHRs do a much better job of calculating the elapsed time from when an acute cerebrovascular accident presents to the initiation of definitive treatment or a specific time interval in this overall process, such as CAT scan order to report time. However, the main accomplishments of PACS are the improvement in patient care they have fostered and in increasing the efficiency of the imaging department. The EHR can be a useful tool for oversight activities and the reporting of benchmarks. However, both the perception and reality should be that its primary function is to improve patient care and safety and make life easier for all health care providers and hospitals.

When first introduced, PACS required a substantial financial investment and time was required to learn how to use them efficiently. Despite the cost and learning curve, PACS have matured and proven themselves to the point where the health care community would not want to return to the previous system. Imaging departments by and large have made the digital switch because the PACS is of greater benefit to the patient, more reliable, efficient, and faster; and therefore more valuable to everyone than the X-ray and view box. Likewise, there is an initial cost and learning curve for use of the EHR.This can be a particular challenge to physicians who are only occasional visitors to the hospital, as contrasted to physicians such as hospitalists who are using the system continuously. However,

the time spent up front will be worth the effort if the EHR proves as valuable to health care as the PACS have shown themselves to be.

SUMMARY

The EHR as required by CMS for hospitals is still in its early stages of development as PACS were a number of years ago. My hope is that the EHR as it is mandated by CMS will be able to accomplish on a global basis for health care what PACS accomplished for imaging. To a very significant extent this is up to a number of parties: the software developers, the hospitals that implement the system, health care providers who use the system, the patients who will be able to receive information in a digital format if they so desire, and CMS who by virtue of its large financial stake in health care is a powerful driver of policy. If all parties are able to work together, the EHR will be transformational in how medicine is practiced and the ultimate beneficiary will be our patients.

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