



11-1-2016

Are Bay County Florida Healthcare Facilities Ready for PAMA Imaging CDS Mandate?

Kelly Johnson

University of Tennessee Health Science Center

Follow this and additional works at: <http://dc.uthsc.edu/hiimappliedresearch>

 Part of the [Health and Medical Administration Commons](#), [Health Services Administration Commons](#), and the [Health Services Research Commons](#)

Recommended Citation

Johnson, Kelly, "Are Bay County Florida Healthcare Facilities Ready for PAMA Imaging CDS Mandate?" (2016). *Applied Research Projects*. 13. . <https://doi.org/10.21007/chp.hiim.0003>
<http://dc.uthsc.edu/hiimappliedresearch/13>

This Research Project is brought to you for free and open access by the Department of Health Informatics and Information Management at UTHSC Digital Commons. It has been accepted for inclusion in Applied Research Projects by an authorized administrator of UTHSC Digital Commons. For more information, please contact jwelch30@uthsc.edu.

Running Head: Is Bay County Ready for PAMA CDS Mandate?

Are Bay County Florida Healthcare Facilities Ready for PAMA Imaging CDS Mandate?

Kelly Johnson, R.T. (S), (VS) (ARRT), BSRS

Master of Health Informatics and Information Management

Post-Graduate, MHIIM

Advisor: Dr. Sajeesh Kumar, PhD

University of Tennessee Health Science Center

November, 2016

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Abstract

The Electronic Health Record (EHR) has been a major player on the healthcare scene in recent years. Its use has ushered in a new phase of focus on quality healthcare combined with and aided by technological integration. Within this technological integration have come adjunct tools including Clinical Decision Support (CDS) tools. Among these applications are those focused on appropriate imaging by use of CDS designed according to Appropriate Use Criteria (AUC). The imaging CDS tools are available to aid the provider in selecting the appropriate imaging study for the clinical indications present. The Protecting Access to Medicare Act (PAMA) passed in April, 2014 outlined requirements to be directed by the Centers for Medicare & Medicaid Services (CMS) with a mandatory implementation of imaging CDS tools for certain providers with an initial deadline of January 2017. Although the deadline has been postponed, the PAMA mandate will be a requirement in the near future. With the imaging CDS mandate implementation looming in the future, affected facilities have an opportunity to prepare their facilities for it and provide education for physicians and staff. However, with the slow adoption rate of the certified EHR, it is likely that there is also that of imaging CDS even though its efficacy has been proven. A survey of affected healthcare facilities was conducted in Bay County, Florida to determine readiness for the impending mandate. While the response rate of the survey was not low, the available sample field was small. Still, the results yielded congruent information to the state adoption rates of the certified EHR and attitudes towards imaging CDS among affected providers. This evidence will be informative to affected facilities and specifically their HIM professionals by means of the information presented. In particular, the survey respondents will benefit from the literature accompanying the survey as some may be unaware of the CMS mandate.

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

IMPACT OF EMR ON HIM STAFF IN TWO SOUTHEASTERN STATES 4

Table of Contents

Abstract	2
List of Tables	5
List of Figures.....	6
Chapter 1 –Introduction	7
Background	9
Purpose of the Study	10
Significance of Study	10
Research Questions	11
Definitions of Key Terms	12
Chapter 2 - Review of Literature	15
Findings	15
Chapter 3 – Methodology	20
Research Design	20
Data Collection Instrument	25
Population and Sample Design	25
Data Collection Procedures	25
Data Analysis	25
Chapter 4 – Results	27
Frequency Tables	27
Chapter 5 – Analysis and Discussion	32
Limitations	35
Chapter 6 – Conclusion and Recommendations	36
Summary of findings	36
Conclusions	36
Implications of the Study	37
Recommendations	37

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

References38

Appendix

Figure 141

Figure 242

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

List of Tables

Table 1: Medical Facility Type

Table 2: Medical Record type

Table 3: When did your facility implement an electronic healthcare record?

Table 4: Current Stage of EMR Implementation, based on the HIMSS EMR Adoption Model

Table 5: Is your EHR equipped with CPOE (computerized physician/provider order entry)?

Table 6: Is the CPOE functionality used on a regular basis?

Table 7: Is the CPOE functionality coupled with an Imaging/Radiology Clinical Decision Support tool?

Table 8: If an Imaging/Radiology Clinical Decision Support tool is available, is it currently utilized?

Table 9: If the Imaging/Radiology Clinical Decision Support tool is utilized, how often is it consulted?

Table 10: If the Imaging/Radiology Clinical Decision Support tool is not currently utilized or unavailable, are there plans in place to make use of the function in advance of the CMS mandate for implementation?

Table 11: Do you think the Imaging/Radiology Clinical Decision Support tool will aid your facility in proper selection of appropriate imaging studies?

Table 12: Will the delay of the CMS mandate for Imaging/Radiology Clinical Decision Support tool implementation enable your facility to provide education and preparation for physicians and staff regarding the change?

Table 13: Comparison of Bay County Adoption Rate of Imaging CDS Systems in EHR with Florida Adoption Rate of Certified EHR

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

List of Figures

Figure 1: Survey Questionnaire: Imaging/Radiology Clinical Decision Support Tool Implementation and Use

Figure 2: HIMSS' US EMR Adoption Model; 2015

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Are Bay County Florida Healthcare Facilities Ready for PAMA Imaging CDS Mandate?

Chapter 1

Introduction

Due to the increasing cost of health care in the United States and its persistent climb upward, measures are being taken to identify and address the areas where these expenditures are greatest while still providing quality care. Radiological imaging is one area that has been highlighted as a major contributor to the rise. As technology advancements in the imaging field have been some of the most significant in healthcare, a rise in utilization is expected. However, the inordinate rise of usage of healthcare imaging technology and the subsequent skyrocket in cost has been in part due to “inappropriate utilization” (Blackmore, et. al 2011). This inappropriate utilization is largely due to the fact that providers often select imaging studies that are not truly in alignment with the clinical indications present in their patients. This inappropriate usage leads to redundancies, needless studies, unnecessary exposure to ionizing radiation, and avoidable costly financial expenditures. All of these undesirable outcomes negatively affect quality care for the patient and contribute to the excessive costs associated with the inappropriate usage of imaging services. Therefore, it was apparent that there was a need for providers to have the ability to determine the appropriateness of the imaging studies they order.

In response to this need, in April 2014, President Obama signed the “Protecting Access to Medicare Act (PAMA)” which included “a mandate that physicians utilize appropriate use criteria via clinical decision support for ordering advanced imaging studies such as diagnostic MRI, CT, and nuclear medicine (including PET)”, (Pitts 2014). This mandate will not be imposed on hospital inpatient imaging orders and some qualifying emergency department orders. The targeted facilities affected by the mandate include the “physician office, hospital outpatient,

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

and emergency department settings”, (Keen 2014). Centers for Medicare & Medicaid Services (CMS) has gone into action to structure this mandate.

Initially a deadline for the implementation of the imaging clinical decision support mandate was set for January 1, 2017. The mandate “requires that CDS must be used for CT, MRI, and Nuclear Medicine studies (including PET), specifically for non-emergency Medicare outpatients”, (Herman 2016). CMS has extended the deadline and has not yet set a specific date for the mandate. Therefore, there is now a window of time available for affected facilities to employ the imaging CDS tools and educate physicians and staff on the impending mandated implementation. To determine the readiness for the impending CMS mandate among Bay County, Florida healthcare facilities, a survey was performed. This paper will attempt to determine the current implementation of the imaging CDS tools, plans for implementation, and expectations of the usefulness of the tool by way of a survey in the Bay County, Florida area.

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Background

Quality in healthcare in the United States has been a concern for over a century. Throughout the early 1900s and throughout the 20th century there have been efforts and achievements in achieving yet ever higher levels of quality healthcare. More recently, quality efforts in healthcare have taken a more pronounced role in healthcare facilities. This role has given birth to many initiatives and mandates to achieve a healthier patient population and higher quality healthcare while still attempting to control cost. With the advent of the electronic health record (EHR), improved outcomes have been noted in achieving higher quality care. This is in part due to the availability of clinical decision support (CDS) tools. Initially these tools were used for a variety of purposes and often made available through the computerized physician/provider order entry (CPOE) system. However, clinical decision support was not as readily available in reference to ordering imaging studies.

The need to utilize imaging clinical decision support systems only gained more interest by governmental and industry experts when excessive ordering of low utility imaging studies resulted in rising healthcare costs. According to a recent study, “imaging is one of the most important contributors to health care costs, encompassing more than 14% of Medicare Part B expenditures”, (Bernardy et al 2009). As this trend continues to persist, imaging clinical decision support tools have taken center stage in the quest to quell the rising trend. Numerous studies have been performed to evaluate these system’s efficacy and benefits. The overwhelming evidence has suggested that these systems do indeed aid providers in selecting the most appropriate imaging studies based on a given set of clinical indications. This is a benefit for all parties involved. Thus CMS has mandated that these systems become a staple in certain medical environments.

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Purpose of the Study

The purpose of this study is to evaluate the readiness in a select group of Bay County, Florida healthcare facilities for the impending CMS PAMA mandate. By analyzing data from a survey of health records management professionals or others within these facilities with access to the requisite information, this study aims to quantify their organizations' readiness for the mandate by measuring the percentages of facilities who currently have the imaging CDS technology in place and for those facilities lacking the technology, their plans to implement the systems. Additionally, the study seeks to identify the attitudes toward the impending mandate in the locality.

Significance of Study

This study seeks to provide insight into the preparedness for the impending CMS imaging clinical decision support tools mandate in a given locality. This insight will aid in determining if departmental and organizational leaders will “get an early start on understanding the implications associated with it”, (Herman 2016). The opportunity now exists for affected entities “to get ahead of a situation that is sure to impact both operational and financial management.” (Herman 2016). Although CMS mandated the CDS implementation with a deadline of January 2017, there was a postponement. Therefore, according to the Journal of the American College of Radiology the “new deadline remains unspecified, although we anticipate that a new date will be announced in the MPFS final rule for calendar year 2017.” (Jensen and Durand 2016).

This survey will help to highlight the benefit of the delay for providers that are unaware of or unprepared for the impending mandate and how it will affect their organizations. With the recent delays and changes in ICD-10 mandate implementation many providers are still adjusting to that sizable transition. With this added mandate looming in the distance, it is a benefit to be

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

aware of the impending requirement and thus have the opportunity to begin making the needed alterations.

Facilities participating in this survey will benefit from this study by having the option of obtaining information about the mandate along with the questionnaire. This information may provide a much-appreciated signal that will be of benefit to their facilities in preparation for the mandate. This research will provide significant data that will enable healthcare professionals to develop effective approaches for their organization to address the possible needs in meeting the CMS requirement. This evidence can be used for getting talking points together for meetings, acquiring options for specific EHR functions related to the required CDS tools, and initiating training on the new functions available in the imaging CDS program.

Research Questions

This study seeks to identify the readiness of affected healthcare facilities in response to the impending mandated implementation by CMS for imaging CDS systems.

The two specific research questions are:

- What percentage of affected Bay County, Florida facilities have implemented imaging CDS systems?
- If the affected facilities' implementation of imaging CDS systems has not already occurred, what percentage have plans in place to take advantage of the extra time allowed by the CMS delay to prepare for the mandate?
- What percentage of the affected facilities view the new technology has a helpful tool in selecting appropriate imaging studies?

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

The analysis of the survey data will focus on type of facility, stage of EHR implementation, use of imaging CDS tools and other variables. Survey data will be analyzed by creating a database, coding data, entering data, cleaning the data and calculating frequencies.

Definitions of Key Terms

- ACR- American College of Radiology is nonprofit professional society with member radiologists, medical physicists and radiation oncologists. ACR Standards define principles for the delivery of high-quality imaging and therapeutic care (radiologyinfo.org).
- AUC- Appropriate Use Criteria are defined as criteria that are evidence-based (to the extent feasible) and assist professionals who order and furnish applicable imaging services to make the most appropriate treatment decisions for a specific clinical condition (cms.gov).
- CDS- Clinical Decision Support Systems are computer applications designed to aid providers in selecting appropriate orders, studies, etc. for their patients. These are generated according to input from the provider as to current clinical indications.
- CMS- Centers for Medicare & Medicaid Services (CMS) is part of the U.S. Department of Health and Human Services. CMS manages many national healthcare agendas. This includes those that involve health information technology such as electronic health records (EHR).
- CPOE- A provider's use of computer assistance to directly enter medical orders (for example, medications, consultations with other providers, laboratory services, imaging studies, and other auxiliary services) from a computer or mobile device (cms.gov).
- EHR- Electronic Health Record is an electronic version of a patients' medical history, that is maintained by the provider over time, and may include all of the key administrative clinical data relevant to that persons care under a particular provider, including demographics,

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports (cms.gov).

- HIM-Healthcare Information Management is information management of medical records. Obtaining, evaluating and protecting healthcare information is the main thrust of this field and plays a major role in providing quality patient care.
- Imaging Clinical Decision Support Systems/Tools- clinical decision-support (CDS) software that is based on appropriate use criteria (AUC) in reference to ordering advanced imaging studies (CT, MRI, Nuclear Medicine, and PET).
- ONC- The Office of the National Coordinator for Health Information Technology is a staff division of the Office of the Secretary, within the U.S. Department of Health and Human Services.
- PAMA- Protecting Access to Medicare Act was passed by President Obama in April 2014 and included “a mandate that physicians utilize appropriate use criteria via clinical decision support for ordering advanced imaging studies such as diagnostic MRI, CT... nuclear medicine” and PET scans (Pitts 2014).
- RBMs- Radiology benefits managers are widely used by private payers to manage the utilization of imaging services through prior authorization, and they have been proposed for use in the Medicare program (Lee et al 2011).
- RBMA- Radiology Business Management Association is an industry leader in offering educational opportunities to assist its members to effectively manage radiology related entities.

“Imaging Clinical Decision Support Systems” and “Imaging Clinical Decision Support Tools” as well as other slight variations of the terminology will be used to describe the concept

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

central to this research. This concept can be defined by the general definition given in the definition of key terms section.

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Chapter 2

Review of Literature

An in-depth search of pertinent literature was performed using the Discovery Service for University of Tennessee Health Science Center Library databases, American Society of Radiologic Technologists body of knowledge, American College of Radiology body of knowledge, and Google Scholar search engine. In addition, a search of the citations from selected references was completed.

Search guidelines were followed for each database using keywords that pertained to EHR, CDS, and PAMA. The keywords and combinations of the keywords used in the searches include imaging clinical decision mandate, imaging CDS, radiology clinical decision support, radiology CDS, PAMA CDS, appropriate use criteria, radiology benefits managers, RBMs, PAMA delay, and PAMA mandate delay. This literature review restricted inclusion of articles to those that were published in the years 2011 to the present, written in English, full text and discussed the mandate, its delay and research on the efficacy of the use of the imaging CDS. Articles written more than 3 years leading up to the April 2014 PAMA mandate was enacted were excluded due to the mandate and associated topics being the thrust of the focus of this paper.

Many articles were found in the literature search containing information on the PAMA mandate, its delay, and research on currently existing imaging CDS tools.

Findings

Focus on Imaging Clinical Decision Support Systems. In efforts to improve the quality of healthcare in the United States, institution of the EHR has played a major role. As the use of the EHR has increased, incorporation of other tools within the system has aided in further

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

improvements in providing healthcare. The CPOE is an integral part of the EHR and is typically equipped with some forms of clinical decision support tools. Providing the option of imaging clinical decision support tools within the CPOE has been offered and available for some time (Keen 2014). However, this technology and its use have received increased visibility due to the concern over inappropriate imaging studies being performed resulting in a heavy financial burden on insurers like Medicare and Medicaid. This is not only a concern of expense but also of patient exposure to unnecessary imaging studies. According to a white paper by American College of Radiology (ACR) and Radiology Business Management (RBMA) regarding best practices, use of imaging CDS would lead to decreasing the occurrence of “repeat studies, delays while attempting to revise an order to permit a more appropriate study, and additional administrative costs, as well as patient inconvenience and potentially unnecessary or repeated exposure to radiation and contrast” (ACR & RBMA 2014).

As a stop gap measure prior to the increased attention that imaging CDS has been given, use of Radiology Benefit Managers (RBM) was implemented. By definition “RBMs, either independent organizations or payer-owned, are contracted to determine the appropriateness of ordering advanced imaging procedures in the outpatient setting based on the patients’ clinical indications (signs, symptoms, or diagnoses) as well as the third-party payers’ internal proprietary guidelines”, (ACR & RBMA 2014). The use of RBMs is often in conjunction with a mechanism known as “prior-authorization”, (ACR & RBMA 2014). Prior authorization of the patient’s benefits is completed before “performance of the imaging study is often required for payment, and may involve selection of the imaging provider by the RBM” (ACR & RBMA 2014). This method of imaging selection has not been well-received by the radiology community as they may see “RBMs as invaders that undermine radiology’s ability and responsibility to select appropriate

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

imaging and help reduce the amount of unnecessary imaging procedures” (Hansen, 2012). Not only are they seen as outsiders having too much control over which radiological studies are performed and at which imaging provider’s facility, there is a concern over many RBMs ethical procedures. This is due to the purported ““hassle factor” for certain procedures...In essence, these groups make certain procedures so difficult to order that referring physicians simply stop ordering them”, (Hansen 2012). Hence, due to concern over patients’ possibly not receiving proper care, the ACR “does not endorse RBMs or their approach to the marketplace, as there are better alternatives” (Hansen 2012).

Therefore, to address the need for better utilization of imaging services and the overwhelmingly negative view of RBMs by the radiological field, alternatives have been explored and the imaging CDS tool has come to the fore as the most all-encompassing satisfactory option. The ACR stated “CDS systems provide a favorable alternative to RBMs and other preauthorization” (ACR & RBMA 2014).

Consequently, in response to the CMS PAMA mandate, and the positive acceptance of the imaging CDS system, the “American College of Radiology (ACR), leveraging its 20 years of experience in developing Appropriateness Criteria, has published ACR Select” (Cooke 2015). The ACR Select has the ability to “satisfy the criteria as specified by CMS, enabling Appropriate Use Criteria within CPOE and EHR workflows” within imaging CDS systems (Cooke 2015). Thus, the CMS has deemed ACR as a ““qualified Provider-Led Entity” (qPLE) approved to provide appropriate use criteria (AUC) under the Medicare Appropriate Use Criteria program for advanced diagnostic imaging” (ACR 2016). The ACR is among a growing number of CMS approved Provider-Led Entities. These entities have gotten behind the movement to implement the use of the imaging CDS tools. The rationale behind the movement is that up-to-date research

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

proves that these systems indeed perform as promised and “although current tools are not perfect, they are already reducing variation, waste, and cost, making them a key value enhancer for patients”, (Boland et al 2015).

Patients receive the benefits of implementation of imaging CDS tools and early studies show gains for providers as well. In one study it was determined that “targeted use of imaging clinical decision support is associated with large decreases in the inappropriate utilization of advanced imaging tests” (Blackmore et al 2011). This may at first seem that there would be a drop in revenues generated by radiology departments. However, use of the imaging CDS tools under the PAMA mandate ensure a swifter and more streamlined reimbursement from Medicare and Medicaid (Boland et al 2015). Denials for payment on inappropriate imaging should present less of an issue and thus a greater return on imaging utilization because of the value inherently associated with already determined appropriateness of the ordered exam. According to one analysis, imaging CDS based on ACR Select “enables radiologists to participate in value driven healthcare by ensuring that appropriate tests are ordered and that a structured, codified reason for the study is recorded. A structured reason for an exam enables the radiologist to better interpret the exam...thus guiding the physician to the correct test”, (Cooke 2015).

Studies performed to indicate the overall effectiveness and reliability of the available imaging CDS tools presents an array of results but nearly all tend to show improvements in reducing low utility studies. According to a systematic review and meta-analysis performed by the U.S. Department of Veterans Affairs, “Thirteen studies provided moderate-level evidence that CCDS improves appropriateness (effect size, -0.49 [95% CI, -0.71 to -0.26]) and reduces use (effect size, -0.13 [CI, -0.23 to -0.04]),” (Goldzweig et al 2015). In another study it was noted that “early data show that in the first 6 months of implementation, approximately 10% of

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

studies that could be scored were scored as inappropriate” (Huber et al 2016). However, in each of the aforementioned studies, overall radiological utilization did decrease. This may seem a foreboding marker for the future, yet there is reason to embrace the technology. As the Huber study mentioned that with imaging CDS in place, “the lack of preauthorization could eliminate some degree of gatekeeper effect” which would likely result that “volume ultimately increases”, (Huber et al 2016).

Even with the proven efficacy of imaging CDS tools in reducing inappropriate imaging studies as well as the impending PAMA mandate, there still is a slow adoption rate. This slow adoption is in part due to the perception that “physicians are not likely to embrace a radiology CDS system with open arms. Similar to speech recognition dictation systems, there may be far more resistance than acceptance”, (Keen 2014).

This forecasted slow adoption rate of imaging CDS tools reported in the literature reviewed for this paper precipitated interest in the possible trend and led to the performing of a survey. To analyze if this trend is occurring in the Bay County, Florida area, the decision was made to conduct a focused survey of locally affected facilities to determine the overall readiness, implementation plans and attitudes toward the impending imaging CDS system CMS mandate.

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Chapter 3

Methodology

Research Design

A survey questionnaire (Figure 1) was developed to collect information to examine the readiness and implementation plans of imaging CDS tools in PAMA affected entities. The final data collection tool contained the following variables:

1. Medical Facility Primary Type
2. Type of Medical Record
3. When did your hospital implement an electronic healthcare record?
4. Based on the HIMSS EMR Adoption Model (Figure 2) at what stage of EHR implementation is your facility presently?
5. Is your EHR equipped with CPOE (computerized physician/provider order entry)?
6. Is the CPOE functionality used on a regular basis?
7. Is the CPOE functionality coupled with an Imaging/Radiology Clinical Decision Support tool?
8. If an Imaging/Radiology Clinical Decision Support tool is available, is it currently utilized?
9. If the Imaging/Radiology Clinical Decision Support tool is utilized, how often is it consulted?
10. If the Imaging/Radiology Clinical Decision Support tool is not currently utilized or unavailable, are there plans in place to make use of the function in advance of the CMS mandate for implementation?

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

11. Do you think the Imaging/Radiology Clinical Decision Support tool will aid your facility in proper selection of appropriate imaging studies?

12. Will the delay of the CMS mandate for Imaging/Radiology Clinical Decision Support tool implementation enable your facility to provide education and preparation for physicians and staff regarding the change?

Variables and rationale

Medical Facility Primary Type. Survey choices were:

Physician's Office

Outpatient Center

Emergency Department

Rationale: The type of facility is of primary importance in this study as only certain facility types are impacted by the PAMA mandate (Keen 2014).

Type of Medical Record. Survey choices were:

Totally electronic (paperless)

Hybrid (part electronic and part paper)

All paper

Rationale: The type of medical record used by a facility is an important indicator of its adjustment to and acceptance of the EHR and CDS tools. The facilities' EHR and CDS implementation or lack thereof will demonstrate their efforts toward transition to the technology.

When did your facility implement an electronic health record? Survey choices were:

Within the past 12 months

1 – 3 years ago

4 – 6 years ago

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Over 6 years ago

Do not have an EHR

Rationale: The length of time an organization has an EHR may have an impact on the completeness of the facilities' usage of all features of their EHR including any CDS functions.

Stage of EMR Implementation based on HIMSS adoption model. Survey choices were: Stages 0 – 7. (Figure 2)

Rationale: As with length of time since the facility implemented their EHR, the stages of adoption of the EHR also factor in to what functions are available and used.

Is your EHR equipped with CPOE (computerized physician/provider order entry)?

Survey choices were:

Yes

No

Not applicable

Is the CPOE functionality used on a regular basis?

Yes

No

Not applicable

Rationale: The above two questions were included in the survey tool to delineate if there is the function within the individual EHR for the provider to have the ability of placing orders for labs, imaging, etc. This is typically the area of the EHR where an imaging CDS would be situated.

Is the CPOE functionality coupled with an Imaging/Radiology Clinical Decision

Support tool? Survey choices were:

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Yes

No

Not applicable

Rationale: This question supplies an answer to the main focus of this research paper.

If an Imaging/Radiology Clinical Decision Support tool is available, is it currently utilized?

Survey choices were:

Yes

No

Not applicable

Rationale: Some EHRs have the imaging CDS tools available but either because they are unaware or opposed to its use, some providers do not utilize the tool.

If the Imaging/Radiology Clinical Decision Support tool is utilized, how often is it consulted?

Survey choices were:

All of the time

Most of the time

Some of the time

Almost never

Not applicable

Rationale: Organizational policies vary as to use of the imaging CDS tools if they are implemented, therefore there could be some situations where it is not required or available.

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

If the Imaging/Radiology Clinical Decision Support tool is not currently utilized or unavailable, are there plans in place to make use of the function in advance of the CMS mandate for implementation? Survey choices were:

Yes

No

Not applicable

Rationale: The response to this question will reveal how prepared the facility is for the mandate.

Do you think the Imaging/Radiology Clinical Decision Support tool will aid your facility in proper selection of appropriate imaging studies? Survey choices were:

Yes

No

Not sure

Not applicable

Rationale: The answer to this question will reveal attitudes toward the imaging CDS tool and its usefulness to the organization.

Will the delay of the CMS mandate for Imaging/Radiology Clinical Decision Support tool implementation enable your facility to provide education and preparation for physicians and staff regarding the change? Survey choices were:

Yes

No

Not sure

Not applicable

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Rationale: The answer to this question will reveal if the facility will take advantage of the extra time to prepare for and implement the imaging CDS tool in advance of the PAMA mandate.

Approval

A draft of the survey questionnaire was submitted to Dr. Sajeesh Kumar, associate professor for the University of Tennessee Health Informatics & Information Management Department. Approval was given by Dr. Kumar.

Data collection instrument

A data collection instrument was developed incorporating the variables discussed above. The survey was administered by email, phone, or paper copy hand delivered depending on convenience for the participant.

Population and Sample Design

A select group of healthcare organizations in Bay County, Florida that will be affected by the impending PAMA mandate were chosen to receive an invitation to participate in the survey.

Data Collection Procedures

Phone calls were made to possible participants to determine their willingness to respond to the survey. If the prospective respondent expressed their wishes to have the survey emailed or hand delivered accommodations were made for them. Otherwise, the survey was performed over the phone. The data collection period was from October 18, 2016 to October 28, 2016.

Data Analysis

After the collection period ended, all survey responses were collected and then an Excel database was created. The data was then coded and entered into the Excel database. The data was then cleaned and analyzed and tables created. Frequencies were calculated using the COUNTIF

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

function in Excel. Percentages were then calculated. Excel was used for all data analysis in this thesis.

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Chapter 4**Results****Frequency Tables**

Totals of the frequencies and percentages of the responses to each of the 12 survey questions are shown in Tables 1 through 12. Tables 1 through 9 deliver data on the facility types and their respective use of the EHR and/or CPOE and/or imaging CDS tools. Table 10 reveals whether plans are in place to implement imaging CDS tools in advance of the CMS mandate. Tables 11 and 12 detail survey respondents' opinions regarding the usefulness of the new technology and what the delayed implementation of the mandate means for their facilities. Table 13 uses the latest data provided by the Office of the National Coordinator for Health Information Technology (ONC) on the state of Florida's adoption of certified EHR to compare with this survey's data on Bay County's adoption of imaging CDS within the EHR (ONC 2016). The reason this comparison is made is because the ONC certified EHR either currently has or will include "clinical decision support functionality incorporating appropriate use criteria (AUC) for advanced imaging", (ONC 2015). This comparison was made because there was no current information on state adoption rates of imaging CDS as they are incorporated in overall certified EHR adoption rates.

Table 1		Medical Facility Primary Type	
Code	Response Item	Frequency	Percent
1	Physician's Office	6	75.00%
2	Outpatient Center	1	12.50%
3	Urgent Care Center	0	0.00%
4	Emergency department	1	12.50%
	Total	8	100.00%

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Table 2		Medical Record Type	
Code	Response Item	Frequency	Percent
1	Totally electronic	0	0.00%
2	Hybrid	5	62.50%
3	All paper	3	37.50%
	Total	8	100.00%

Table 3		When did your facility implement an electronic healthcare record?	
Code	Response Item	Frequency	Percent
1	Within the last 12 months	0	0.00%
2	1-3 years ago	0	0.00%
3	4-6 years ago	3	37.50%
4	over 6 years ago	2	25.00%
5	doesn't have EHR	3	37.50%
	Total	8	100.00%

Table 4		Based on the HIMSS EMR Adoption Model, at what stage of EHR implementation is your facility presently?	
Code	Response Item	Frequency	Percent
1	stage 0	3	37.50%
2	stage 1	0	0.00%
3	stage 2	0	0.00%
4	stage 3	0	0.00%
5	stage 4	0	0.00%
6	stage 5	5	62.50%
7	stage 6	0	0.00%
8	stage 7	0	0.00%
	Total	8	100.00%

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Table 5		Is your EHR equipped with CPOE (computerized physician/provider order entry)?	
Code	Response Item	Frequency	Percent
1	Yes	5	62.50%
2	No	0	0.00%
3	Not applicable	3	37.50%
	Total	8	100.00%

Table 6		Is the CPOE functionality used on a regular basis?	
Code	Response Item	Frequency	Percent
1	Yes	5	62.50%
2	No	0	0.00%
3	Not applicable	3	37.50%
	Total	8	100.00%

Table 7		Is the CPOE functionality coupled with an Imaging/Radiology Clinical Decision Support tool?	
Code	Response Item	Frequency	Percent
1	Yes	3	37.50%
2	No	2	25.00%
3	Not applicable	3	37.50%
	Total	8	100.00%

Table 8		If an Imaging/Radiology Clinical Decision Support tool is available, is it currently utilized?	
Code	Response Item	Frequency	Percent
1	Yes	2	25.00%
2	No	1	12.50%
3	Not applicable	5	62.50%

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

	Total	8	100.00%
--	-------	---	---------

Table 9		If the Imaging/Radiology Clinical Decision Support tool is utilized, how often is it consulted?	
Code	Response Item	Frequency	Percent
1	All of the time	2	25.00%
2	Most of the time	0	0.00%
3	Some of the time	0	0.00%
4	Almost never	0	0.00%
5	Not applicable	6	75.00%
	Total	8	100.00%

Table 10		If the Imaging/Radiology Clinical Decision Support tool is not currently utilized or unavailable, are there plans in place to make use of the function in advance of the CMS mandate for implementation?	
Code	Response Item	Frequency	Percent
1	Yes	2	25.00%
2	No	3	37.50%
3	Not applicable	3	37.50%
	Total	8	100.00%

Table 11		Do you think the Imaging/Radiology Clinical Decision Support tool will aid your facility in proper selection of appropriate imaging studies?	
Code	Response Item	Frequency	Percent
1	Yes	4	50.00%
2	No	1	12.50%
3	Not sure	2	25.00%
4	Not applicable	1	12.50%
	Total	8	100.00%

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Table 12		Will the delay of the CMS mandate for Imaging/Radiology Clinical Decision Support tool implementation enable your facility to provide education and preparation for physicians and staff regarding the change?	
Code	Response Item	Frequency	Percent
1	Yes	4	50.00%
2	No	0	0.00%
3	Not sure	3	37.50%
4	Not applicable	1	12.50%
	Total	8	100.00%

Table 13	
Comparison of Bay County Adoption Rate of Imaging CDS Systems in EHR with Florida Adoption Rate of Certified EHR	
Florida Certified EHR Adoption Rate	0-25%
Bay County EHR with Imaging CDS Rate	25%

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Chapter 5

Analysis and Discussion

Seventy-five percent (75%) of the respondents were from physician's offices; twelve and a half percent (12.5%) were from outpatient patient centers and twelve and a half percent (12.5%) were from emergency departments. No urgent care centers participated (Table 1).

Sixty-two and a half percent (62.5%) of the respondents have a hybrid medical record type. Thirty-seven and a half percent (37.5%) of the respondents have an all paper medical record type. None of the respondents have a totally electronic medical record type (Table 2).

Thirty-seven and a half percent (37.5%) of the facilities implemented their EHR within the last four (4) to 6 years and 25% did so over 6 years ago; thirty-seven and a half percent (37.5%) of the respondents indicated that their facilities had no EHR (Table 3).

Sixty-two and a half percent (62.5%) of the respondents reported being at stage 5 of the HIMSS' US EMR Adoption Model. Thirty-seven and a half percent (37.5%) of the facilities reported being at stage 0 (Table 4).

Sixty-two and a half percent (62.5%) of the respondents reported that their EHR was equipped with a CPOE. Thirty-seven and a half percent (37.5%) of the facilities replied that this was not applicable because they do not have an EHR (Table 5).

Sixty-two and a half percent (62.5%) of the respondents reported that their CPOE is used on a regular basis. Thirty-seven and a half percent (37.5%) of the facilities replied that this was not applicable because they do not have an EHR (Table 6).

Thirty-seven and a half percent (37.5%) of the facilities replied that their CPOE was equipped with imaging CDS. Thirty-seven and a half percent (37.5%) of the facilities replied that

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

this was not applicable because they do not have an EHR. Twenty-five percent (25%) of the respondents replied that their CPOE was not coupled with an imaging CDS (Table 7).

Sixty-two and a half percent (62.5%) of the respondents reported that this question was not applicable because they do not have an EHR. Twenty-five percent (25%) of the respondents replied that their imaging CDS tools are currently utilized. Twelve and a half percent (12.5%) reported that their imaging CDS tools are not currently utilized (Table 8).

Seventy-five percent (75%) of the respondents reported that this question does not apply because they either do not have or do not utilize the imaging CDS tool. Twenty-five percent (25%) of the respondents reported that the imaging CDS tool is used all of time (Table 9).

Thirty-seven and a half percent (37.5%) of the facilities replied that there are no plans in place to implement the imaging CDS tool prior to the mandate. Thirty-seven and a half percent (37.5%) of the facilities replied that this was not applicable because they currently have the imaging CDS tools implemented. Twenty-five percent (25%) of the respondents replied that they have plans in place to implement CDS tools prior to the mandate (Table 10).

In survey question 11, half of the respondents believe that imaging CDS tools are or would be beneficial to their facilities' in selecting appropriate imaging studies. Twenty-five percent (25%) of the respondents reported that they are unsure if imaging CDS tools would be helpful to their facility in selecting the appropriate imaging study. Twelve and a half percent (12.5%) reported that they do not believe imaging CDS tools would be helpful to their facility. Twelve and a half percent (12.5%) reported that the question of whether imaging CDS tools would be helpful to their facility is not applicable (Table 11).

Survey question 12 was designed to perceive whether they view the CMS delay as a period of opportunity to make the needed upgrades and begin education on the technology. Half

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

of the respondents view this delay as an opportunity to provide education and begin preparation for the mandate. Thirty-seven and a half percent (37.5%) of the facilities replied that they are not sure if this delay will enable their facility to make plans and provide education prior to the mandate. Twelve and a half percent (12.5%) reported that the question was not applicable (Table 12).

Comparison of Bay County Adoption Rate of Imaging CDS Systems in EHR with Florida Adoption Rate of Certified EHR

Per the latest graphic available from the ONC, Florida has a statewide 0-25% certified EHR adoption rate (ONC 2016). ONC Certified EHR systems either currently include imaging CDS systems or will have the capabilities (ONC 2015). Therefore, comparing the results of this survey to the state average of certified EHR use was performed.

This comparison revealed in Table 13 shows the overall Bay County adoption rate of imaging CDS tools is 37.5%. The 0-25% statewide adoption of certified EHRs in Florida is shown as well. To make a proper comparison, the statewide adoption was converted from a range to an average resulting in a 12.5% statewide adoption rate. Therefore, the Bay County adoption rate is higher by 25.5% points than the statewide adoption rate.

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Limitations

There are important limitations of the study to be considered.

- The survey conducted for this study was not statewide but confined to one Florida county. The number of respondents was therefore limited. A nationwide or statewide survey would have yielded a larger sample of responses.
- Because the literature review returned no current information on state adoption rates of imaging CDS as they are typically incorporated in overall certified EHR adoption rates, Table 13 uses the latest data provided by the National Coordinator for Health Information Technology (ONC) on the state of Florida's adoption of certified EHR to compare with this survey's data on Bay County's adoption of imaging CDS within the EHR (ONC 2016). This comparison was thus made because it was the most appropriate assessment available for estimating a comparison at the county level versus the state level of imaging CDS adoption.

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Chapter 6

Conclusion and Recommendations

Summary of findings

Although respondents from the Bay County healthcare community revealed that they are not entirely ready for the CMS imaging CDS mandate, the survey results revealed that this county is ahead of the state in its certified EHR adoption. However, due to the small sample size and the indirect comparison, no definitive correlation can be made.

In Bay County, Florida opinions as to the usefulness of imaging CDS systems, revealed in Table 11, show a positive attitude toward the technology. Therefore, although the imaging CDS systems are not fully implemented, positive attitudes toward the technology often precede full adoption.

Conclusions

The three research questions for this study are:

- What percentage of affected Bay County, Florida facilities have implemented imaging CDS systems?
- If the affected facilities' implementation of imaging CDS systems has not already occurred, what percentage have plans in place to take advantage of the extra time allowed by the CMS delay to prepare for the mandate?
- What percentage of the affected facilities view the new technology has a helpful tool in selecting appropriate imaging studies?

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

The results of this survey answer the research questions in this way:

- 37.5% of respondents have the imaging CDS tools implemented.
- 25% have plans to implement the imaging CDS tools prior to the CMS mandate.
- 50% view the imaging CDS technology as a beneficial tool.

The results of this survey clearly indicate that a large portion of Bay County, Florida healthcare facilities are making changes to meet the CMS imaging CDS mandate.

Implications of the Study

Bay County healthcare facilities will benefit from this study by having a clearer picture of the actual requirements of the impending CMS imaging CDS mandate. This research will provide significant data that will enable healthcare professionals to develop effective approaches for their organization to address the possible needs in meeting the CMS requirement. This evidence can be used for getting talking points together for meetings, acquiring options for specific EHR functions related to the required CDS tools, and initiating training on the new functions available in the imaging CDS program

Recommendations

The most important recommendation to be drawn from the Bay County, Florida survey is for healthcare facilities to view this research as a positive maker for the locality as to implementation of imaging CDS tools. With that said, there is still much work to do, but there is still time due to the CMS delayed implementation date. If those in the healthcare community have learned anything from prior CMS mandates, such as ICD-10, getting a jumpstart is a real benefit.

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

References

- American College of Radiology. (2016, June 20). ACR appropriateness criteria now satisfy federal AUC requirements. Retrieved October 20, 2016, from <http://www.acr.org/About-Us/Media-Center/Press-Releases/2016-Press-Releases/20160620-ACR-Appropriateness-Criteria-Now-Satisfy-Federal-AUC-Requirements>
- American College of Radiology, & Radiology Business Management Association. (2014). Clinical decision support. American College of Radiology. doi:10.1007/springerreference_63499
- Bernardy, M., Ullrich, C., Rawson, J., Allen B, J., Thrall, J., Keysor, K., & ... Mabry, M. (2009). Strategies for managing imaging utilization. *Journal Of The American College Of Radiology*, 6(12), 844-850. doi:10.1016/j.jacr.2009.08.003
- Blackmore, C., Mecklenberg, R., & Kaplan, G. (2011). Effectiveness of clinical decision support in controlling inappropriate imaging. *American College of Radiology*, 8(1), 19-25. <http://dx.doi.org/10.1016/j.jacr.2010.07.009>
- Boland, G. W., Weilburg, J., & Duszak, R. J. (2015). Imaging appropriateness and implementation of clinical decision support. *Journal Of The American College Of Radiology: JACR*, 12(6), 601-603. doi:10.1016/j.jacr.2015.03.014
- Centers for Medicare & Medicaid Services, Department of Health and Human Services. (n.d.). *CPOE for Medication, Laboratory and Radiology Orders*. Retrieved October 20, 2016, from https://www.cms.gov/.../Stage2_HospitalCore_1_CPOE_MedicationOrders.pdf
- Cooke, R. (2015). Utilization management and ACR Select. *Radiology Management*, 37(2), 9-12.

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Goldzweig, C. L., Orshansky, G., Paige, N. M., Miake-Lye, I. M., Beroes, J. M., Ewing, B. A., &

Shekelle, P. G. (2015). Electronic health record-based interventions for improving appropriate diagnostic imaging: a systematic review and meta-analysis. *Annals Of Internal Medicine*, 162(8), 557-565. doi:10.7326/M14-2600

Hansen, B. (2012, September 12). Taking back imaging, can radiologists keep imaging decisions within the specialty without interference from RBMs? Retrieved October 20, 2016, from <http://www.acr.org/News-Publications/News/News-Articles/2012/ACR-Bulletin/201209-Taking-Back-Imaging>

Herman, S. (2016). Preparing for the delayed — but still coming — PAMA mandate for radiology clinical decision support. *Applied Radiology*, 45(1), 6-8.

HIMSS Analytics. (n.d.). The EMR adoption model. Retrieved October 20, 2016, from <https://app.himssanalytics.org/stagesGraph.asp>

Huber, T., Gaskin, C. M., & Krishnaraj, A. (2016). Early experience with implementation of a commercial decision-support product for imaging order entry. *Current Problems In Diagnostic Radiology*, 45(2), 133-136. doi:10.1067/j.cpradiol.2015.10.001

Jensen, J. D., & Durand, D. J. (2016). Partnering with your health system to select and implement clinical decision support for imaging. *Journal of the American College of Radiology*. doi:10.1016/j.jacr.2016.07.030

Keen, C. E. (2014). Planning for radiology CDS technology. *Healthcare Informatics*, 31(8), 17-22

Keen, C. (2014, July 2). The clinical decision-support mandate: now what? Retrieved October 01, 2016, from <http://www.radiologybusiness.com/topics/policy/clinical-decision-support-mandate-now-what?nopaging=1>

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Lee, D., Rawson, J., & Wade, S. (2011, June). Radiology benefit managers: Cost saving or cost shifting? Retrieved October 20, 2016, from

<https://www.ncbi.nlm.nih.gov/pubmed/21636053>

Office of National Coordinator for Health Information Technology Health IT Policy Committee.

(2015, September 1). QMTF transmittal letter [Letter to Karen DeSalvo, MD]

Office of the National Coordinator for Health Information Technology. (2016, February). Office-based Physician Health IT Adoption. Retrieved October 20, 2016, from

<http://dashboard.healthit.gov/dashboards/physician-health-it-adoption.php>

Pitts, J. (2014, April). Text - H.R.4302 - 113th Congress (2013-2014): Protecting access to Medicare act of 2014. Retrieved September 30, 2016, from

<https://www.congress.gov/bill/113th-congress/house-bill/4302/text>

Radiological Society of North America and American College of Radiology. (n.d.). What is ACR? Retrieved October 20, 2016, from

<http://www.radiologyinfo.org/en/info.cfm?pg=about-acr>

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Appendix

Figure 1.

Survey Questionnaire: Imaging/Radiology Clinical Decision Support Tool Implementation and Use

1. Medical Facility Primary Type

Physician's Office

Outpatient Center

Emergency Department

2. Medical Record type

Totally electronic (paperless)

Hybrid (part electronic and part paper)

All paper

3. When did your facility implement an electronic healthcare record?

Within the past 12 months

1 – 3 years ago

4 – 6 years ago

Over 6 years ago

Do not have an EHR

4. Based on the HIMSS EMR Adoption Model, at what stage of EHR implementation is your facility presently?

(please see chart at the end of this document for definitions of stages if needed)

Stage 0

Stage 1

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Stage 2

Stage 3

Stage 4

Stage 5

Stage 6

Stage 7

5. Is your EHR equipped with CPOE (computerized physician/provider order entry)?

Yes

No

Not applicable

6. Is the CPOE functionality used on a regular basis?

Yes

No

Not applicable

7. Is the CPOE functionality coupled with an Imaging/Radiology Clinical Decision Support tool?

Yes

No

Not applicable

8. If an Imaging/Radiology Clinical Decision Support tool is available, is it currently utilized?

Yes

No

Not applicable

9. If the Imaging/Radiology Clinical Decision Support tool is utilized, how often is it consulted?

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

- All of the time
- Most of the time
- Some of the time
- Almost never
- Not applicable

10. If the Imaging/Radiology Clinical Decision Support tool is not currently utilized or unavailable, are there plans in place to make use of the function in advance of the CMS mandate for implementation?

- Yes
- No
- Not applicable

11. Do you think the Imaging/Radiology Clinical Decision Support tool will aid your facility in proper selection of appropriate imaging studies?

- Yes
- No
- Not sure
- Not applicable

12. Will the delay of the CMS mandate for Imaging/Radiology Clinical Decision Support tool implementation enable your facility to provide education and preparation for physicians and staff regarding the change?

- Yes
- No
- Not sure

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

___Not applicable

IS BAY COUNTY READY FOR PAMA CDS MANDATE?

Figure 2.

HIMSS' US EMR Adoption Model; 2015

US EMR Adoption Model SM			
Stage	Cumulative Capabilities	2015 Q3	2015 Final
Stage 7	Complete EMR; CCD transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP	4.1%	4.2%
Stage 6	Physician documentation (structured templates), full CDSS (variance & compliance), full R-PACS	25.4%	27.1%
Stage 5	Closed loop medication administration	34.6%	35.9%
Stage 4	CPOE, Clinical Decision Support (clinical protocols)	10.3%	10.1%
Stage 3	Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	17.3%	16.4%
Stage 2	CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable	3.4%	2.6%
Stage 1	Ancillaries - Lab, Rad, Pharmacy - All Installed	1.8%	1.7%
Stage 0	All Three Ancillaries Not Installed	3.1%	2.1%

Data from HIMSS Analytics™ Database © 2016

N = 5,454 N = 5,460