

2008 Wisconsin Ambulatory Health Information Technology Survey

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State of Wisconsin

Governor's eHealth Care Quality and Patient Safety Board

Department of Health Services





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ABSTRACT/EXECUTIVE SUMMARY

The 2008 Wisconsin Ambulatory Health Information Technology Survey represents the second time the Wisconsin Department of Health Services (the Department) conducted a survey of the use of health information technology by clinical practices in the State. This year’s survey focused primarily on small and independent practices since it was known that most large group practices are currently either using or implementing electronic health record (EHR) systems. This survey parallels a national EHR study recently published in the New England Journal of Medicine and represents the most comprehensive information to date on the perceptions and use of EHR systems by Wisconsin’s independent physician community. This survey contains data collected between June and December 2008 on the adoption and use of EHR systems from 297 small group practices representing 1,097 office-based physicians. It also contains organizational-level EHR adoption data from the State’s largest clinical group practices.

Twenty-four percent of small practices (33% of small practice physicians) reported having an operational EHR system, 8% of small practices (10% of small practice physicians) reported to be in the process of implementing an EHR system, and 68% of small practices (57% of small practice physicians) reported having no EHR system.

EHR systems can be classified as basic or fully functional based on the level of functionality implemented. A basic EHR system is defined as having a limited set of core EHR functions implemented whereas a fully functional EHR system has a broad complement of functions implemented. According to survey responses, 12% of small practices (21% of small practice physicians) have a basic EHR system and 2% of small practices (4% of small practice physicians) have a fully functional EHR system.

(n=297)	EHR adoption rates for small practices	EHR adoption rates for physicians in small practices
Operational EHR	24%	33%
<u>Implementing EHR</u>	<u>08%</u>	<u>10%</u>
Total	32%	43%
Basic EHR	12%	21%
Fully functional EHR	02%	04%

Physicians practicing in small groups account for only about one-third of the State’s office-based physicians. The majority (69%) of physicians practice in large groups or integrated health systems with 50 or more physicians. These larger groups often have greater access to financial and administrative resources making the acquisition, implementation, and operation of EHR systems more attainable. According to this year’s survey, approximately 72% of large practice physicians have access to operational EHR systems and 23% have EHR systems in the process of implementation.



	Office-based physicians	Rate of physicians using operational EHR	Office-based physicians using operational EHR
Physicians in small practices	3,650	33%	1,200
Physicians in large practices**	8,110 *	72%	5,810
Total physicians	11,760 **	60%	7,010

* Based on WMS estimate of 69% of WI physicians practicing in groups with >50 physicians

** Office-based physicians are estimated to be 90% of the 13,071 practicing WI physicians

When EHR adoption data from small and large practices were weighted and merged, the overall rate of Wisconsin office-based physicians with operational EHR systems is approximately 60% and the rate of physicians implementing EHR systems is approximately 19%. When combined, 79% of physicians have acquired EHR systems. This represents a 6% increase from the previous Wisconsin survey that measured physician acquisition of EHR systems at 73%.

Compared to national data on EHR adoption, Wisconsin office-based physicians have significantly higher rates of EHR adoption. While 60% of Wisconsin physicians had operational EHR systems, approximately 38% of physicians nationally used EHR systems in the ambulatory care setting.

Through a natural technological progression and the emergence of policy initiatives in the American Recovery and Reinvestment Act of 2009, Wisconsin will continue to move closer to a more interconnected, digital health care system. While EHR adoption is necessary to improve health care quality and decrease costs, it is only the first step. Once implemented, clinicians must effectively use EHR systems, share information with other providers, and identify evidence-based best practices and incorporate them into the practice of health care. Although Wisconsin is well positioned to reach the federal goal of universal EHR adoption by 2014, there is still significant work required beyond EHR adoption to realize the potential a digital health care system has to improve quality, lower costs, and save lives.



INTRODUCTION

Executive Order 129 charges the eHealth Care Quality and Patient Safety Board (eHealth Board) with annually assessing the extent to which automated information and decision support systems are used by health care providers in Wisconsin. The 2008 Wisconsin Ambulatory Health Information Technology Survey marks the second time the State has conducted this survey. The report on the 2006/2007 survey is available at:

<https://www.dhs.wisconsin.gov/publications/p0/p00831-1107.pdf>. In June 2008, the New England Journal of Medicine published a study entitled “Electronic Health Records in Ambulatory Care—A National Survey of Physicians” (National Survey), which comprehensively measured the use of EHR systems in the ambulatory care setting.¹ The 2008 Wisconsin survey was largely based on the National Survey but does not significantly depart from the previous Wisconsin survey. Both surveys were based on the National Ambulatory Medical Care Survey (NAMCS).²

Both national and previous local surveys of clinical practice EHR adoption have indicated the main determinant for EHR adoption is practice size with larger practices (a greater number of physicians) having significantly higher rates of EHR adoption than smaller practices. This was an important consideration when developing this year’s survey. While much is known about the larger clinical practices in Wisconsin, there was limited information on EHR adoption and use by independent or small practices. The 2008 survey focused on gathering comprehensive data on the implementation, functionality, and use of EHR systems in smaller practices. Additionally, the survey updated and added to the knowledge base of EHR adoption and use by larger group practices.

METHODS

Development of survey instrument

The survey instrument for the 2008 Wisconsin Ambulatory Health Information Technology Survey merged the questions from the 2006/2007 Wisconsin Survey with questions from the National Survey. The eHealth Board members and the Wisconsin Medical Society (WMS) assisted in selecting and refining the survey questions.

Wisconsin has two distinct groups of physicians: those practicing independently or in small practice groups of less than 50 physicians and those practicing in large practice groups of 50 or more physicians. Therefore, they were surveyed separately using different methods. Small practices were contacted by phone and surveyed with a web-based survey while large practices were surveyed through direct telephone contact and a limited number of survey questions.

Small practice survey delivery

Small practices are defined as those having less than 50 physicians. The Department constructed a database of approximately 1,800 independent/small practices using information from the WMS and the National Provider Identifier database (July 2008 release).³ Entries for hospital-based providers, large group practices, and non-clinical professionals were removed from the database.



The University of Wisconsin Survey Center (UWSC) conducted the survey of the small groups. They randomly selected small practices from the database and contacted each selected practice by telephone to identify the “practice manager” or an “individual responsible for the practice’s medical records.” The UWSC then sent this individual an email with a link to a secure online survey. If the UWSC did not receive a complete survey response, they sent email reminders at 7 and 14 days following the initial contact and then made an additional phone call to evoke a response to the survey. The UWSC surveyed 297 small practices between August and December 2008.

Large practice survey delivery

Large practices are defined as those having 50 or more physicians. The Department collected survey data from large practices through informational interviews with each organization’s Chief Information Officer or IT manager in conjunction with an abbreviated survey. Respondents provided qualitative and quantitative information on EHR deployment and the implemented functionality at the organization’s clinics. This method was used because it was not always possible for one individual to provide complete and accurate site-specific data for all of the organization’s clinical sites. The Department was able to obtain complete survey data from many of the large health systems and also used data from the previous survey to supplement current survey data when applicable. The Department surveyed the large systems between October 2008 and January 2009.

RESULTS

Small practice survey response rates

The UWSC attempted to contact 1,130 small practices. They eliminated 544 of the 1,130 practices from their survey population largely because either the contact information was incorrect, the practice was now affiliated with a large group, the practice refused to participate, or for other documented reasons. The UWSC successfully contacted a total of 586 small clinical practices by telephone that verbally agreed to participate in the survey. Of the 586 contacts, 297 satisfactorily completed the online survey yielding a response rate of 51%.

Responding small practice characteristics

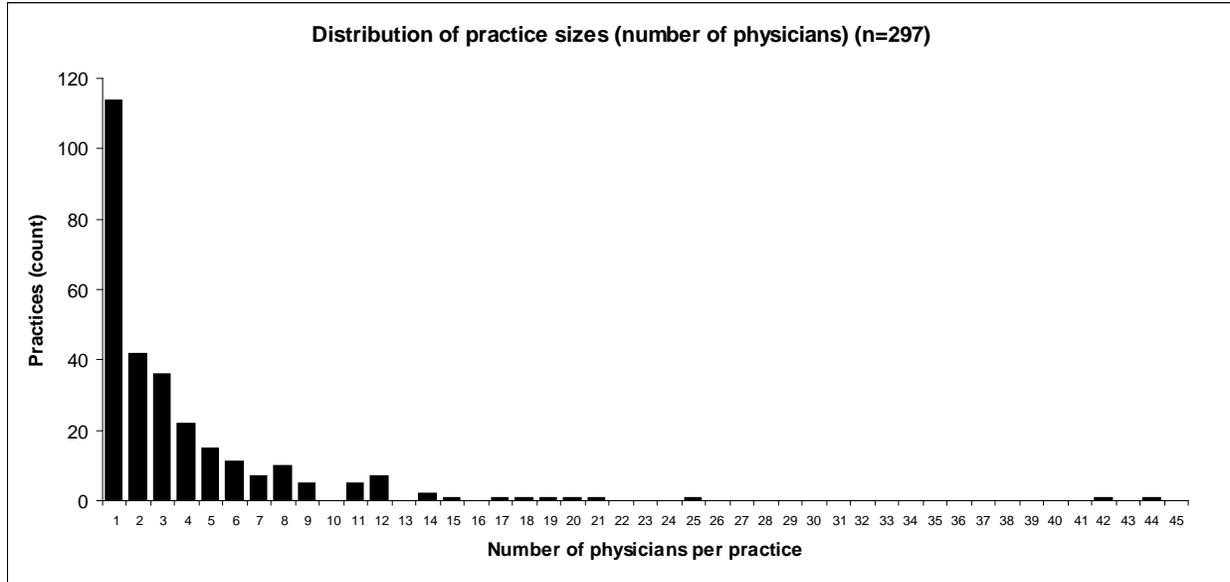
The UWSC received survey responses from 297 small practices representing 1,097 physicians, 299 physician assistants and nurse practitioners, and 1,055 nurses. The average number of physicians in responding practices was 3.7 and the median number of physicians was 2. The average number of mid-level providers (physician assistants and nurse practitioners) per practice was 1.0 and the average number of nurses was 3.6. The survey responses represent about 30% of the office-based independent or small practice physicians in Wisconsin.

Thirty-eight percent of the responding practices reported being solo practices, 14% reported having two physicians, 12% reported having three physicians, 7% reported having four physicians, and 25% reported having five or more physicians in the practice (Figure 1). Four



percent of respondents reported having no physicians. Respondents without a physician were attributable to imaging or laboratory facilities or to ambulatory surgical centers.

Figure 1. Histogram of responding small practices and the number of physicians in each.



Ninety percent of small practice respondents described the practice site as a physician’s office. Other practice site descriptions were reported as a hospital outpatient department (6%), an ambulatory surgical center (3%), or an urgent care center (1%).

Twenty-three percent of responding small practices provide primary care, 62% provide specialty care, 14% provide both primary and specialty care, and 1% reported providing no patient care.

Measures and rates of small practice EHR adoption

Because the terms “EHR” and “adoption” can vary in nature and scope, this report uses multiple methods to measure the rate of “EHR adoption” by ambulatory care practices as well as practitioners.

The survey asked small practices whether the practice had an EHR system that was either operational, in the process of implementation, or whether it had no EHR system. Twenty-four percent of the responding small practices had an operational EHR system, 8% were in the process of implementing an EHR system, and 68% reported having no EHR system.

When this data was analyzed along with the number of physicians in each practice, it was found that 33% of small practice physicians used operational EHR systems, 10% were in the process of implementing EHR systems, and 57% of small practice physicians did not have EHR systems.



Table 1. EHR adoption rates for responding small practices and associated physicians.

(n=297)	EHR adoption rates for small practices	EHR adoption rates for physicians in small practices
Operational EHR system	24%	33%
Implementing EHR system	8%	10%
No EHR system	68%	57%

The National Survey measured EHR adoption based on implemented EHR functionality. This survey inquired about the use of 17 different EHR functions and described a fully functional system as one having all 17 functions implemented and a basic system as having 7 specific functions implemented.⁴

A basic EHR system is defined as a system with the following functions implemented and operational: patient problem lists, clinical notes, orders for prescriptions, patient medication lists, viewing lab results, viewing imaging results, and patient demographics. Of the small practices responding to this survey, approximately 12% are using a basic EHR system (Table 2).

A fully functional EHR system is defined as a system with 17 total EHR functions implemented and operational (a list of all functions can be found in Table 3). Approximately 2% of the small practices responding to this survey had implemented fully functional EHR systems.

When analyzing the responding small practices' EHR adoption rates at the physician level, approximately 21% of small practice physicians are using a basic system and 4% are using a fully functional EHR system. The physician adoption rate is higher than the small practice adoption rate because even among small practices, the practices with more physicians generally have higher rates of EHR adoption.

Table 2. Measures and rates of EHR adoption for responding small practices.

(n=297)	EHR adoption rates for small practices	EHR adoption rates for physicians in small practices
Operational EHR	24%	33%
<u>Implementing EHR</u>	<u>08%</u>	<u>10%</u>
Total	32%	43%
Basic EHR	12%	21%
Fully functional EHR	02%	04%



Use of e-prescribing by small practices

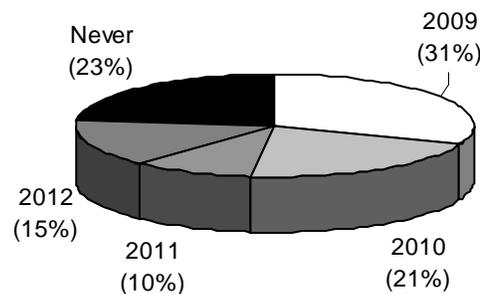
Small practices responded to a variety of questions regarding the use of e-prescribing technology. About 28% of all responding small practices have the ability to electronically enter orders for prescriptions and about 19% of small practices have the ability to electronically send prescriptions to pharmacies. Of the small practices with e-prescribing capabilities, 89% reported that the e-prescribing function was part of their EHR system, whereas the other 11% use a “stand-alone” e-prescribing system.

Of the small practices with e-prescribing capabilities, all clinicians use the e-prescribing functionality in 71% of the practices, most clinicians use the functionality in 11% of the practices, some clinicians use the functionality in 16% of the practices, and no clinicians use the functionality in 1% of the practices. Therefore, on average, about 84% of the clinicians in these small practices use the e-prescribing function.

Beginning in 2009, providers are eligible to receive a 2% increase in Medicare reimbursement if e-prescribing technology is used to electronically transmit prescriptions to pharmacies using the National Council for Prescription Drug Programs (NCPDP) technological standard. In response to this recent policy, the survey asked small practices if and when they would begin to comply with the Medicare e-prescribing requirements. Thirty-one percent of respondents reported they would be in compliance in 2009, 21% in 2010, 10% in 2011, 15% in 2012, and 23% responded they would not likely comply with the e-prescribing standard.

Figure 2.

Small practice reported anticipated compliance with NCPDP e-prescribing standard



According to Surescripts, the country’s largest electronic prescribing network, Wisconsin had 1,085 active e-prescribing medical professionals at the end of 2008. Because e-prescribing professionals include nurse practitioners in addition to physicians, this number indicates about 7%-8% of all prescribing professionals are active e-prescribers. This Surescripts’ figure represents clinicians from both small and large practices.



EHR functional implementation and use

Small practices with EHR systems reported which functions they had implemented. The functions most often implemented were medical history and follow-up notes (98%), clinical notes (93%), and patient medication lists (85%). On average, basic EHR functions were implemented 77% of the time, and the functions that constitute a fully functional EHR system were implemented 68% of the time. Complete results of individual function implementation rates are listed in Table 3.

Table 3. Rate of small practice implementation of various EHR functions (Larger table format in Appendix A).

(n=96)*	Patient problem lists††	Clinical notes††	Electronic medication lists for patients††	Orders for prescriptions†	Viewing imaging results††	Viewing lab results††	Prescriptions sent electronically†	Warnings for drug interactions†	Medical history and follow-up notes†	Orders for lab tests†	Orders for radiology tests†
Implemented	81%	93%	85%	76%	54%	75%	64%	61%	98%	67%	57%
Not implemented	9%	4%	10%	18%	34%	16%	28%	10%	1%	24%	34%
Don't know	9%	3%	4%	6%	11%	9%	8%	29%	1%	9%	9%

	Lab orders sent electronically†	Radiology orders sent electronically†	Out-of-range levels highlighted†	Electronic images returned†	Reminders for guidelines or screenings†	Quality reporting	Public health reporting	Notifiable diseases sent electronically	Average for "basic" functions	Average for "fully functional" functions
Implemented	62%	53%	70%	41%	56%	41%	15%	29%	77%	68%
Not implemented	33%	38%	14%	25%	23%	30%	44%	43%	15%	20%
Don't know	5%	9%	15%	33%	21%	29%	42%	29%	7%	12%

* n for each function may vary according to the number of respondents with the given function implemented
 †† required for a basic and fully functional EHR
 † required for a fully functional EHR

Small practices with EHR systems also reported to what extent clinicians in the practice used various EHR functions. There was a significantly lower reported use of clinical guidelines, quality reporting, and public health reporting functions (Table 4).

Table 4. Rating of clinician usage of individual EHR functions (Larger table format in Appendix A).

(n=96)*	Patient problem lists	Orders for prescriptions	Electronic medication lists	Orders for lab tests	Orders for radiology tests	Viewing lab results	Viewing imaging results	Clinical notes	Guideline-based reminders	Public health reporting	Quality reporting
All Clinicians	76%	71%	77%	70%	65%	80%	64%	82%	48%	36%	47%
Most Clinicians	12%	11%	11%	13%	12%	11%	14%	11%	15%	7%	8%
Some Clinicians	12%	16%	11%	15%	16%	9%	12%	6%	35%	21%	36%
No Clinicians	0%	1%	0%	2%	8%	0%	10%	1%	2%	36%	8%
Average use	88%	84%	89%	84%	78%	90%	77%	91%	70%	48%	65%

* n for each function may vary according to the number of respondents with the given function implemented.



EHR adoption by small practices without EHR systems

Small practices without EHR systems were asked if and when the practice would acquire an EHR system. Forty-two percent of practices reported they would never acquire an EHR system, 7% reported they would do so within 1 year, 34% reported they would do so within 1 to 3 years, and 17% indicated they would do so, but not within the next 3 years.

Figure 3.



Respondents without EHR systems identified which barriers had most deterred the practice from acquiring an EHR system. Practices were asked to describe a particular barrier as being a major barrier, a minor barrier, or not a barrier to EHR adoption (Table 5). Major barriers most cited were the large initial capital investment, finding an EHR system that meets the needs of the practice, and the uncertain return on investment (ROI) associated with EHR systems. Other barriers to EHR adoption, such as resistance by physicians and security and privacy concerns, were perceived as less significant.

Table 5. Rating of perceived barriers to EHR adoption by small practices without EHR systems (Larger table format provided in Appendix A).

(n=202)	Required capital	Finding EHR system that meets needs	Return on investment (ROI) uncertainties	Capacity to contract and implement EHR system	Productivity loss	Physician resistance	Security and privacy concerns	Legal liability if patient have more data	EHR system may quickly become obsolete
Major barrier	60%	41%	39%	32%	31%	23%	23%	16%	18%
Minor barrier	31%	39%	38%	42%	44%	41%	41%	42%	37%
No barrier	10%	20%	23%	26%	25%	36%	35%	43%	45%

Additionally, practices without EHR systems were asked what incentives or policies might affect their decision to acquire an EHR system. Practices described the incentive or policy as having a major impact, minor impact, or no impact on the decision to adopt an EHR system.

Government-mandated EHR use was cited as having the greatest impact on EHR adoption. Financial incentives for acquiring EHR systems, such as financial subsidies and tax credits, were



also cited as having a major impact whereas certification of EHR functionality and interoperability standards were viewed as having less impact on EHR adoption.

Table 6. Incentives promoting EHR adoption and perceived impact by small practices without EHR systems.

(n=202)	Government mandate	Financial subsidies	Tax credits	Pay for performance initiatives	Certification of functionality	Interoperability standards
Major impact	60%	54%	51%	34%	29%	27%
Minor impact	27%	33%	29%	43%	51%	53%
No impact	13%	13%	20%	23%	21%	20%

Large group practices and electronic health record adoption

More than two-thirds (69%) of Wisconsin physicians currently practice in large groups or integrated systems of 50 or more physicians.⁵ This is unique when compared to national statistics revealing only about 2% of physicians practice in large groups.⁶ National Survey data also indicate that these large practices are about three to four times more likely to have implemented EHR systems than practices with fewer physicians. Larger practices benefit from economies of scale and often have the leadership and administrative support required to acquire, implement, and operate EHR systems.

Because the number of physicians in large practices can vary considerably (from 50 to over 1,000 physicians per group practice), the EHR adoption rate for large practices was measured at the physician level, rather than at the practice level. Representatives of the large group practices were asked if the organization had an operational EHR system, one that was in the process of implementation, or no EHR system. Additionally, where possible, information was gathered on the extent and uniformity of system-wide EHR deployment. Based on that data and the number of physicians in large practices or integrated health systems, approximately 72% of large practice physicians have operational EHR systems and about 23% of those physicians are in the process of implementing an EHR system.

Overall electronic health record adoption by office-based physicians

To measure overall EHR adoption by office-based physicians in Wisconsin, data from large and small practices were weighted, merged, and analyzed. The measure of EHR adoption which applied uniformly to both large and small practices was whether the practice had an operational EHR system. The overall EHR adoption rate as well as the total number of physicians with EHR systems was then calculated by multiplying the number of physicians in each group by the corresponding EHR adoption rate (Table 7). Approximately 33% or 1,200 physicians in small practices had operational EHR systems, and 72% or 5,810 physicians in large practices had



operational EHR systems. Therefore, a total of 7,010, or 60%, of an estimated 11,760 office-based physicians in Wisconsin have access to operational EHR systems.

Table 7. Number and rate of office-based physicians with operational EHR systems.

	Office-based physicians	Rate of physicians using operational EHR	Office-based physicians using operational EHR
Physicians in small practices	3,650	33%	1,200
Physicians in large practices**	8,110 *	72%	5,810
Total physicians	11,760 **	60%	7,010

* Based on WMS estimate of 69% of WI physicians practicing in groups with >50 physicians

** Office-based physicians are estimated to be 90% of the 13,071 practicing WI physicians

DISCUSSION

Comparison with 2006/2007 Wisconsin Survey

EHR adoption

Although the 2006/2007 and 2008 Wisconsin Ambulatory Health Information Technology Survey instruments and methodologies differed, both surveys had the same foundation, thus allowing some level of comparison. The main difference between the two surveys was the method by which EHR adoption was measured. The 2006/2007 Wisconsin Survey asked if practices had a fully electronic, part-paper/part-electronic, or no EHR system, whereas the 2008 Wisconsin Survey asked if EHR systems were operational, in implementation, or nonexistent. To compare these two measures, it is assumed that part-paper/part-electronic would be the equivalent of an EHR in the process of implementation and fully electronic would be the equivalent of an operational EHR system. The addition of these two rates yields a broader measure: physician EHR acquisition. Whether the EHR system is being implemented or is operational, the practice/physician(s) has made the commitment to use an EHR system.



Table 8. Small practice, large practice, and overall Wisconsin physician EHR adoption rates in 2006/2007 and 2008.

	Physicians with Part electronic or Implementing EHR	Physicians with Fully electronic or Operational EHR	Physicians having acquired EHR**
Small practices*			
2006/2007	23%	14%	37%
2008	10%	33%	43%
Large practices*			
2006/2007	50%	39%	89%
2008	23%	72%	95%
All office-based physicians			
2006/2007	42%	31%	73%
2008	19%	60%	79%

* Based on WMS estimate of 69% of WI physicians practicing in groups with >50 physicians

** EHR acquisition equals the addition of the two rates of EHR adoption

In 2006/2007, 23% of physicians in small practices used part-paper/part-electronic EHR systems and 14% used fully electronic EHR systems. When these two levels of EHR adoption are combined, approximately 37% of small practice physicians had acquired EHR systems in 2006/2007. In 2008, 10% of physicians in small practices were in the process of implementing EHR systems and 33% of physicians had operational EHR systems. When combined, approximately 43% of small practice physicians had acquired EHR systems in 2008. The increase from 37% to 43% in EHR acquisition represents a 6% increase in EHR adoption by office-based small practice physicians (Table 8).

In 2006/2007, 50% of physicians in large practices used part-paper/part-electronic EHR systems and 39% used fully electronic EHR systems. When these two levels of EHR adoption are combined, approximately 89% of large practice physicians had acquired EHR systems in 2006/2007. In 2008, 23% of physicians in large practices were in the process of implementing EHR systems and 72% of physicians had operational EHR systems. When combined, approximately 95% of large practice physicians had acquired EHR systems in 2008. The increase from 89% to 95% in EHR acquisition represents a 6% increase in EHR adoption by office-based large practice physicians.

All totaled, in 2006/2007, 42% of physicians used part-paper/part-electronic EHR systems and 31% of physicians used fully electronic EHR systems. When these two levels of EHR adoption are combined, approximately 73% of physicians had acquired EHR systems in 2006/2007. In 2008, 19% of physicians were in the process of implementing EHR systems and 60% of physicians had operational EHR systems. When combined, approximately 79% of office-based



physicians had acquired EHR systems in 2008. The increase from 73% to 79% in EHR acquisition represents a 6% increase in total office-based based physician EHR adoption. This analysis reveals a large shift in both small and large practices from a majority of practices with part electronic systems or EHR systems in the process of being implemented in 2006/2007 to a majority of practices with fully electronic systems or operational EHR systems in 2008. While it is possible that many systems previously in the process of being implemented are now fully operational, this dramatic shift is more likely due to differences in the 2006/2007 and 2008 survey instruments. The analysis of EHR acquisition is an attempt to mitigate the differences in survey methodologies and should be used for trending purposes.

Comparison with 2008 National Electronic Health Records Survey

EHR adoption

The 2008 Wisconsin Ambulatory Health Information Technology Survey instrument was modeled on the National Survey making many comparisons with the National Survey possible (Table 9). According to the National Survey, 12% of physicians in small practices use basic EHR systems and 4% use fully functional EHR systems. Wisconsin physicians in small practices exceed the national rate. About 21% of Wisconsin physicians in small practices use basic EHR systems and 4% use fully functional EHR systems.

Table 9. Wisconsin and national rates of large and small practice physician EHR adoption (Larger table format provided in Appendix A).

	Rate of physicians with operational EHR	Rate of physicians with operational EHR	Rate of physicians with Basic EHR	Rate of physicians with Basic EHR	Rate of physicians with Fully functional EHR	Rate of physicians with Fully functional EHR
	Wisconsin	National ¹	Wisconsin	National ²	Wisconsin	National ²
Physicians in small practices	33%	n/a	21%	12%	4%	4%
Physicians in large practices	72%	n/a	n/a	33%	n/a	17%
All physicians	60%	38%	n/a	13%	n/a	4%

¹ Preliminary estimates of electronic medical records use by office-based physicians: United States, 2008.

² Electronic Health Records in Ambulatory Care - A National Survey of Physicians.

The National Survey reported that 33% of physicians in large groups used basic EHR systems and 17% used fully functional EHR systems. One can assume Wisconsin physicians in large practices significantly exceed the national rates, but the exact values are unknown because of the difficulty acquiring quality, detailed data on EHR usage from large systems.

Another recent national study, “Preliminary Estimates of Electronic Medical Record Use by Office-based Physicians: United States, 2008,” estimated office-based physician use of minimal and fully functional EHR systems to be approximately 38%. Though not an exact comparison, about 60% of Wisconsin office-based physicians use operational EHR systems. These studies



indicate the rate of EHR use by Wisconsin office-based physicians is about 22% greater than the national rate.

These various surveys show that Wisconsin physicians have adopted EHR systems at a greater rate than physicians nationally. This is primarily due to the significantly large proportion (69%) of Wisconsin physicians practicing in large groups. Large group practices have the advantage of economies of scale, thereby reducing per physician investment and operating expenditures for EHR systems.

Barriers to small practice EHR adoption

In small practices in Wisconsin, physicians ranked the significance of barriers in a similar order to their national counterparts. In general, however, Wisconsin small practice physicians viewed these barriers as being less significant than their national counterparts. When this EHR adoption barrier data was analyzed in aggregate, physicians nationally described barriers as major 29% more often than Wisconsin physicians (Table 10).

This difference in perceived barriers to EHR adoption could be partially responsible for the higher rate of EHR adoption among Wisconsin's small practices. The abundance of large group practices and hospitals with EHR systems, in combination with exceptions to Stark rules promoting the adoption of EHR technology, may also serve to reduce perceived and actual barriers to EHR adoption for Wisconsin's small practices.

Table 10. Rates physicians cited major barriers to EHR adoption.

Barrier to EHR adoption	WI	National
Required capital	60%	66%
Finding EHR system that meets needs	41%	54%
Return on investment (ROI) uncertainties	39%	50%
Capacity to contract and implement EHR system	32%	39%
Productivity loss	31%	41%
Security and privacy concerns	23%	18%
Resistance by physicians	23%	29%
EHR system may quickly become obsolete	18%	44%
Legal liability if patient have more data	16%	14%

Also of note, small practices, both locally and nationally, cited finding an EHR system that meets the needs of the practice as the second greatest barrier to EHR adoption. This is consistent with the large percentage (62%) of specialty practices that responded to the survey. Many certified ambulatory EHR systems are designed for primary care, not specialty care. Specialty practices may not be willing to invest in an EHR system with broad and unnecessary functionality unless the system includes specific functions tailored for their specialty. Fortunately, the Certification Commission for Healthcare Information Technology (CCHIT) has begun the process of certifying EHR systems for specialty care such as behavioral health, dermatology, oncology, and obstetrics/gynecology.



CONCLUSION

Wisconsin continues to be a national leader in the adoption and use of EHRs with an estimated 60% of physicians using EHR systems and 19% of physicians in the process of implementing EHR systems. Most EHR adoption in Wisconsin is found in large group practices or integrated health systems, which have greater access to financial and administrative resources and a lower required per-physician investment for acquiring EHR systems. Therefore, because more than two-thirds of Wisconsin physicians practice in groups of 50 or more, the rate of physician EHR adoption in Wisconsin is well above the national average.

While the overall rate of physician EHR adoption rate is high, a gap in EHR adoption exists among Wisconsin's small and independent practices, specialty practices in particular. In Wisconsin, about 33% of small practice physicians use EHR systems and 10% are in the process of implementation. These smaller practices have limited resources, increased per-physician investment, and the additional problem of finding an EHR product that meets the needs of their specialty practice.

While 58% of small practices without EHR systems intend to adopt EHR systems within the next three years, 42% indicated they would never acquire an EHR system. These small practices cited the large required capital investment as the greatest barrier to EHR adoption.

Recent developments at the federal level, specifically the American Recovery and Reinvestment Act of 2009 (ARRA), should significantly affect small practices' decisions to adopt EHR systems. The ARRA will positively alter the trajectory of EHR adoption through \$34 billion in Medicare and Medicaid incentive payments to eligible professionals and hospitals for the meaningful use of certified EHR systems. Also included in the ARRA is funding for state loan and grant programs to promote EHR adoption and health information exchange, and funds to create Health Information Technology Regional Extension Centers to assist providers with the acquisition and meaningful use of certified EHR technologies.

Through a natural technological progression and the emergence of key federal and state policy initiatives, Wisconsin will continue to move closer to a more interconnected, digital health care system. While EHR adoption is necessary to improve health care quality and decrease costs, it is only the first step. Once implemented, clinicians must effectively use EHR systems, share information with other providers, and identify evidence-based best practices and incorporate them into the practice of health care. Although Wisconsin is well-positioned to reach the federal goal of universal EHR adoption by 2014, there is still significant work beyond EHR adoption required to realize the potential a digital health care system has to improve quality, lower costs, and save lives.



APPENDIX A - TABLES

Table 3. Rate of small practice implementation of various EHR functions.

(n=96)*	Patient problem lists††	Clinical notes††	Electronic medication lists for patients††	Orders for prescriptions†	Viewing imaging results††	Viewing lab results††	Prescriptions sent electronically†	Warnings for drug interactions†	Medical history and follow-up notes†	Orders for lab tests†	Orders for radiology tests†
Implemented	81%	93%	85%	76%	54%	75%	64%	61%	98%	67%	57%
Not implemented	9%	4%	10%	18%	34%	16%	28%	10%	1%	24%	34%
Don't know	9%	3%	4%	6%	11%	9%	8%	29%	1%	9%	9%

	Lab orders sent electronically†	Radiology orders sent electronically†	Out-of-range levels highlighted†	Electronic images returned†	Reminders for guidelines or screenings†	Quality reporting	Public health reporting	Notifiable diseases sent electronically	Average for "basic" functions	Average for "fully functional" functions
Implemented	62%	53%	70%	41%	56%	41%	15%	29%	77%	68%
Not implemented	33%	38%	14%	25%	23%	30%	44%	43%	15%	20%
Don't know	5%	9%	15%	33%	21%	29%	42%	29%	7%	12%

* n for each function may vary according to the number of respondents with the given function implemented

†† required for a basic and fully functional EHR

† required for a fully functional EHR



Table 4. Rating of clinician usage of individual EHR functions.

(n=96)*	Patient problem lists	Orders for prescriptions	Electronic medication lists	Orders for lab tests	Orders for radiology tests	Viewing lab results	Viewing imaging results	Clinical notes	Guideline-based reminders	Public health reporting	Quality reporting
All Clinicians	76%	71%	77%	70%	65%	80%	64%	82%	48%	36%	47%
Most Clinicians	12%	11%	11%	13%	12%	11%	14%	11%	15%	7%	8%
Some Clinicians	12%	16%	11%	15%	16%	9%	12%	6%	35%	21%	36%
No Clinicians	0%	1%	0%	2%	8%	0%	10%	1%	2%	36%	8%
Average use	88%	84%	89%	84%	78%	90%	77%	91%	70%	48%	65%



Table 5. Rating of perceived barriers to EHR adoption by small practices without EHR systems.

(n=202)	Required capital	Finding EHR system that meets needs	Return on investment (ROI) uncertainties	Capacity to contract and implement EHR system	Productivity loss	Physician resistance	Security and privacy concerns	Legal liability if patient have more data	EHR system may quickly become obsolete
Major barrier	60%	41%	39%	32%	31%	23%	23%	16%	18%
Minor barrier	31%	39%	38%	42%	44%	41%	41%	42%	37%
No barrier	10%	20%	23%	26%	25%	36%	35%	43%	45%

Table 9. Wisconsin and national rates of large and small practice physician EHR adoption.

	Rate of physicians with operational EHR	Rate of physicians with operational EHR	Rate of physicians with Basic EHR	Rate of physicians with Basic EHR	Rate of physicians with Fully functional EHR	Rate of physicians with Fully functional EHR
	Wisconsin	National ¹	Wisconsin	National ²	Wisconsin	National ²
Physicians in small practices	33%	n/a	21%	12%	4%	4%
Physicians in large practices	72%	n/a	n/a	33%	n/a	17%
All physicians	60%	38%	n/a	13%	n/a	4%

¹ Preliminary estimates of electronic medical records use by office-based physicians: United States, 2008.

² Electronic Health Records in Ambulatory Care - A National Survey of Physicians.



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² Hsiao CJ, Burt CW, Rechtsteiner E, Hing E, Woodwell DA, Sisk JE. Preliminary estimates of electronic medical records use by office-based physicians: United States, 2008. Health E-Stat. National Center for Health Statistics. 2008. Available from: <http://www.cdc.gov/nchs/products/pubs/pubd/hestats/hestats.htm>

³ NPES Data Dissemination file found at http://nppesdata.cms.hhs.gov/cms_NPI_files.html

⁴ The 2008 Wisconsin Survey employed the same methodology except one function. "Patient demographics" was excluded and, therefore, this survey incorporated 16 EHR functions in common with the National Survey.

⁵ Estimate from the Wisconsin Medical Society on physician practice size.

⁶ National Ambulatory Medical Care Survey: 2004 Summary. Hing E, Cherry DK, and Woodwell, DA, Division of Health Care Statistics. <http://www.cdc.gov/nchs/data/ad/ad374.pdf>