ELECTRONIC MEDICAL RECORD IMPLEMENTATION IN OPTOMETRY

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ABSTRACT

Background: Medical records have played an integral part of the health care community and have been crucial in establishing adequate and quality patient care. The use of paper medical records has dominated health care until recently. Electronic health records (EHRs) or electronic medical records (EMRs) are being used more frequently by healthcare providers. This mode of health information storage is becoming more prevalent in all areas of healthcare including optometry.[1] Electronic medical records have a number of advantages and disadvantages. [2,3] *Methods:* We conducted an anonymous survey with practicing optometrists in the state of Michigan who are current members of the Michigan Optometric Association. The survey concentrated on two main categories: optometrists who are currently using EHRs, and optometrists who have not implemented EHRs. For the first group, we addressed challenges doctors faced with establishing EHRs. For the second group, we asked questions regarding why their practices have not yet implemented electronic records. *Results:* A majority of the optometrists surveyed (n=106) indicated that they have not implemented EHRs to date. Two major concerns with electronic record implementation included the cost and additional time needed to establish them. For those who have already implemented them, the major challenges included difficulty with learning a new software system and the extra time needed to become proficient with EHR use. *Conclusions:* The results of this study suggest that the concerns that exist among users of EHRs are similar to those who have not implemented them yet. Additionally it demonstrates that most optometrists who do not have them yet are planning to implement them shortly.

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Background

Medical records have played an integral part of the health care community and have been crucial in establishing adequate and quality patient care. The use of paper medical records has dominated health care until recently. Electronic health records (EHRs), sometimes referred to as electronic medical records (EMRs), are being used more frequently by healthcare providers. This mode of health information storage is becoming more prevalent in all areas of healthcare including optometry.[1] Electronic medical records have a number of advantages as well as disadvantages. [2,3]

Although EHRs are superior to paper records in many regards, there are still disadvantages. One major disadvantage is the initial expense of setting up an EHR system.[2] The US Department of Health and Human Services is cognizant of this disadvantage and has established an incentive program for Medicare and Medicaid health care providers who implement EHRs prior to 2016. Through this program, eligible professionals may claim up to $44,000 for implementing EHRs prior to 2016.[4] The total amount reimbursed is dependent on when the system is initiated and the amount billed to Medicare in that year. If EHRs have not been established in practices by 2015, the Centers for Medicare and Medicaid Services (CMS) will penalize those practices by reducing the reimbursements for examinations billed to Medicare and Medicaid. In addition to the costly initial setup, EMRs have a steep learning curve and require additional time for training and making the transition from paper records.[3] Electronic health records are also inherently more vulnerable to confidentiality and security issues.[2]

Methodology

We conducted an anonymous survey with practicing optometrists in the state of Michigan. Initially we contacted them via email using addresses provided by the Michigan Optometric Association (MOA). Presently 906 of the 1391 optometrists in Michigan are members of the MOA. Invitations to complete an online questionnaire were sent to 700 members of the MOA, of which 106 optometrists completed the survey. The survey concentrated on two main categories: optometrists who are currently using EHRs, and optometrists who have not yet implemented them. For the first group, we addressed challenges doctors faced with establishing EHRs. For the second group, we asked questions regarding why their practice has not established them yet. The questionnaire used is found in *Appendix A*.

Results

As mentioned previously, this survey focused on reasons practices have not instituted EHRs and challenges associated with the implementation of EHRs. There were 106 completed surveys by optometrists currently practicing in the state of Michigan. One aim of this study was to identify the percentage of practicing optometrists currently using EHRs. Forty seven of the 106 doctors who completed the survey indicated that they are currently using electronic records, this accounts for 44% of those surveyed. The following areas were also addressed in the questionnaire: EHR use by age and type of practice, reasons for not implementing EHR, time frame and costs associated with setup, types of software currently being used, major challenges, and the effect of electronic records use on productivity. The following sections outline the results.

Age

Figure 1 demonstrates the percentage of those surveyed who currently use electronic records, categorized by age. Of all the optometrists surveyed, 40% of the participants between 21-30 reported using EHRs, 33% between 31-40, 50% between 41 - 50, 53% between 51-60, and 33% greater than 60.

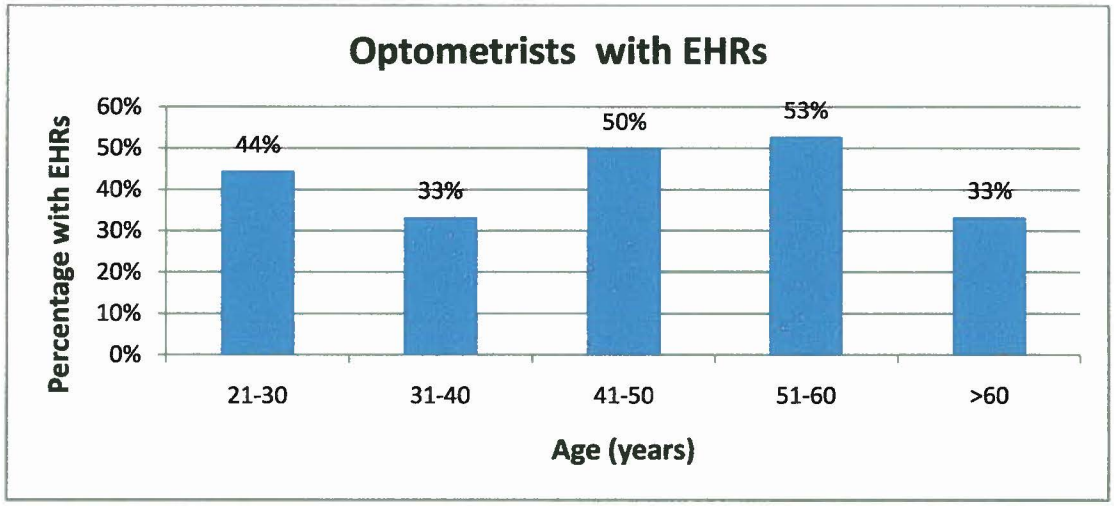

Figure 1 *- Optometrists surveyed who currently use EHRs, categorized by age*

Mode of Practice

In addition to determining the age groups with the highest percentage of EHR use, this survey also identified the type of practice each doctor spends the most time in and whether that practice has electronic records. *Figure 2* represents the percentage of doctors using EHRs based on type of practice.

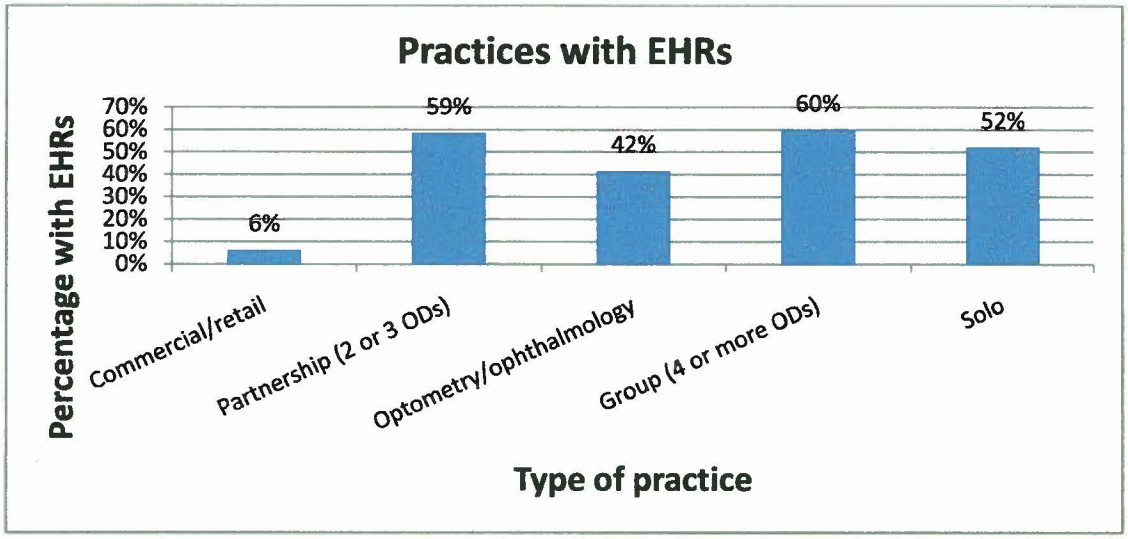

***Figure 2** - Optometrists surveyed who currently use EHRs, categorized by type of practice*

Reasons for Not Implementing EHRs

For those who do not use electronic records at this time, the survey inquired about reasons for them not being implemented. Those surveyed were asked to indicate areas of concern regarding EHR use and *Figure 3* displays the distribution of the responses. The most frequent responses were the added expense of setup and the time required to establish EHRs (both at 23%). Other concerns were that doctors have not identified the appropriate software (17%) or do not have the computers to facilitate EHR use (14%). Lack of information and inadequate desire to learn new technology were only minor concerns and accounted for only 3% of responses. The remaining 19% of responses included other concerns including: difficulty with typing, concerns with the federal government forcing EHR implementation on doctors, having no say in whether electronic records are established in the practice, and concerns of patient confidentiality. Of those surveyed without EHRs, 18% indicated that they do not have concerns with

implementing EHRs and that they are planning on instituting them within the next two years.

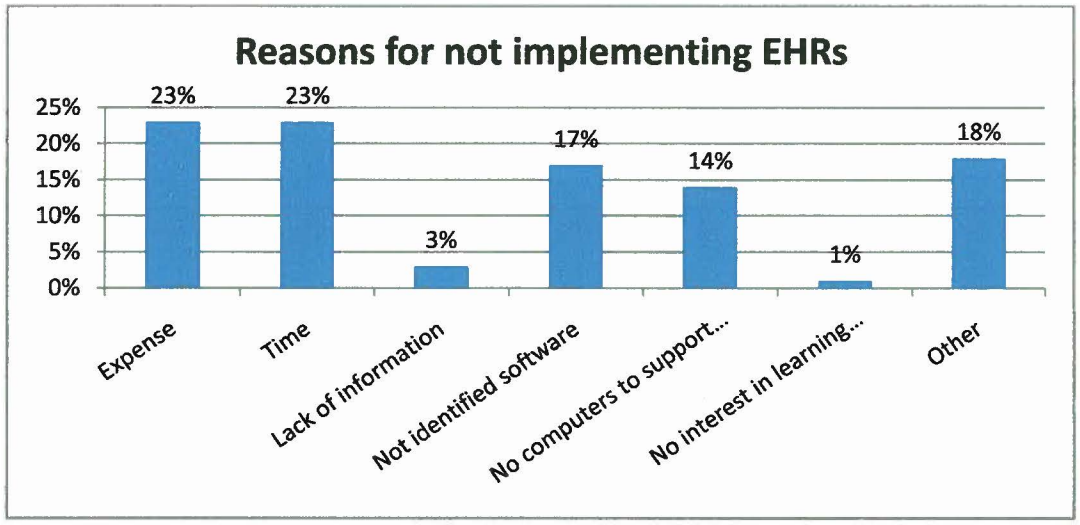

Figure 3 *– Reasons for optometrists not implementing EHRs currently*

Time Frame for Initiating Electronic Records

This survey also identified how quickly doctors who do not currently use EHRs plan on establishing them. *Figure 4* summarizes those responses. Twenty seven percent of those not using electronic records currently do not have plans to implement them, while nearly half (42%) plan on establishing them within the next year.

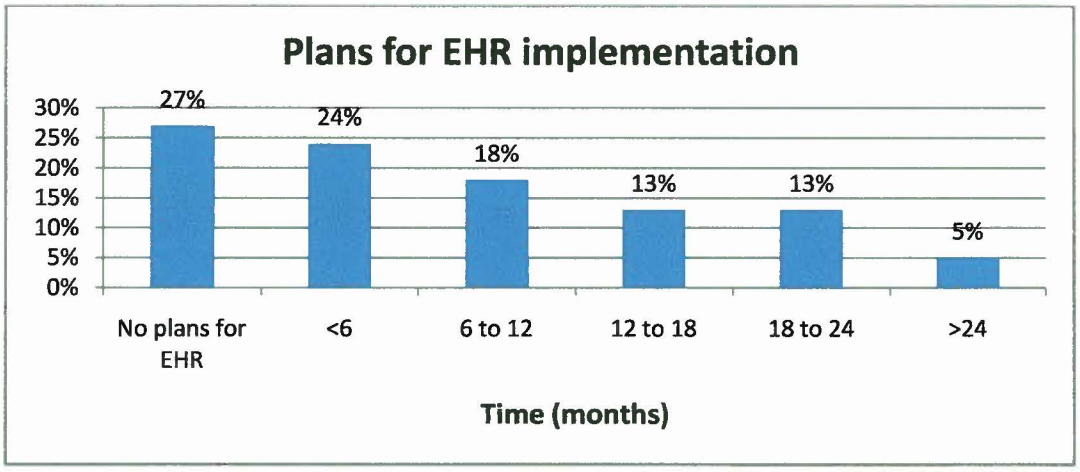

Figure 4 *- Anticipated time before EHR implementation for optometrists not currently using electronic records*

Anticipated and Actual Setup Costs

This study also aimed to identify how much doctors plan on spending to set up EHRs in comparison to the actual cost. The estimated cost to establish electronic records by those who are intending on implementing EHRs is illustrated in *Figure 5* and the approximate cost of implementation to those who currently use EHRs is illustrated in *Figure 6*. Nearly 35% indicated that they were unsure how much it cost to set up EHRs in their practice.

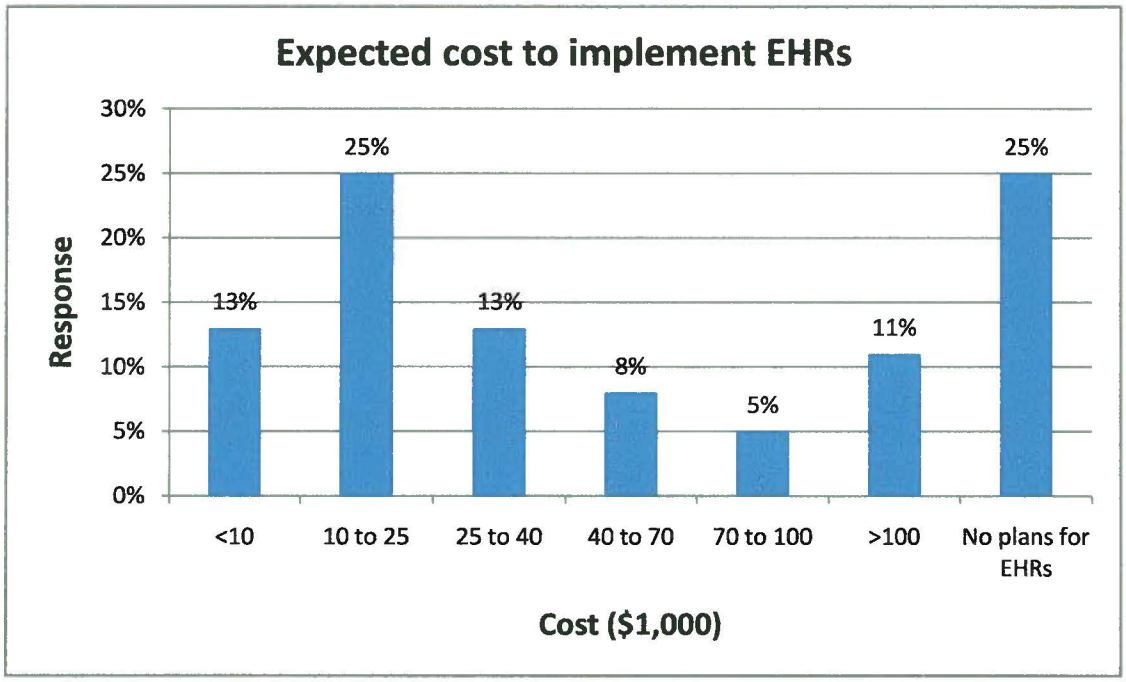

Figure 5 *- Anticipated cost for EHR implementation for optometrists not currently using electronic records*

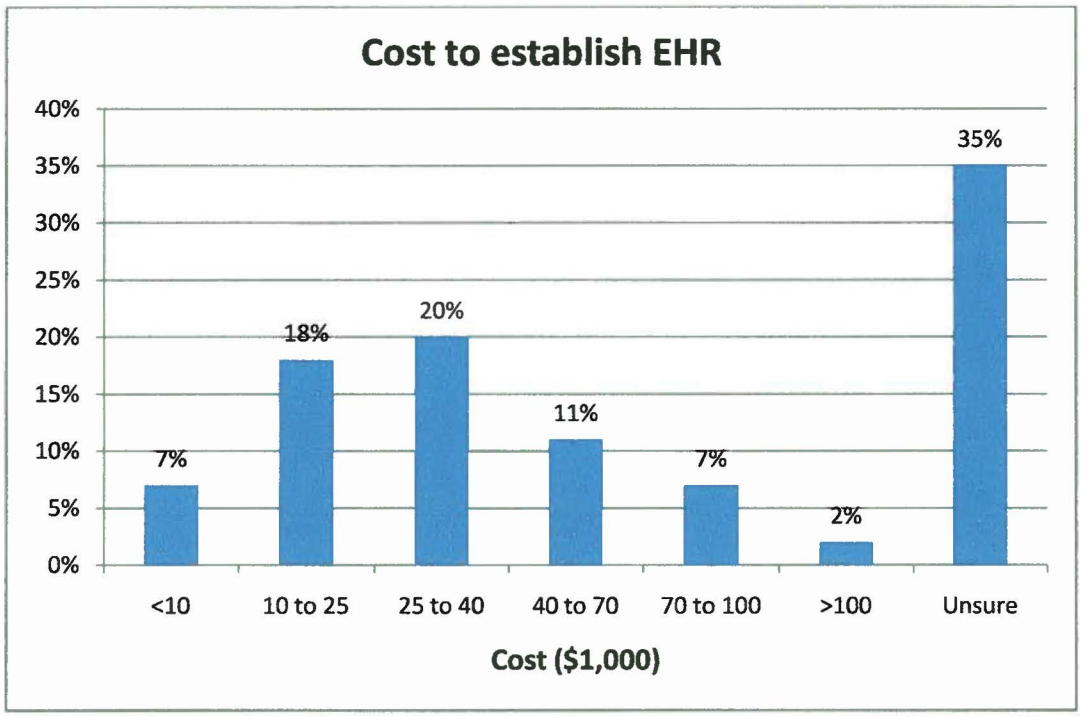

Figure 6 *- Estimated cost for EHR implementation for optometrists currently using electronic records*

Types of EHR Software Currently in Use

In addition to identifying reasons that EHRs have not been established for some practices, this survey also questioned optometrists about the types of systems currently used and some of the concerns and challenges associated with making the transition from paper records to electronic records. First this study identified the types of EHR software most commonly used at this time. The most common software packages in use, which is displayed in *Figure 7*, are Officemate and Compulink Eyecare Advantage, used by 41% and 39% respectively. Maximeyes, Nextgen and Revolution are the other programs used by those surveyed.

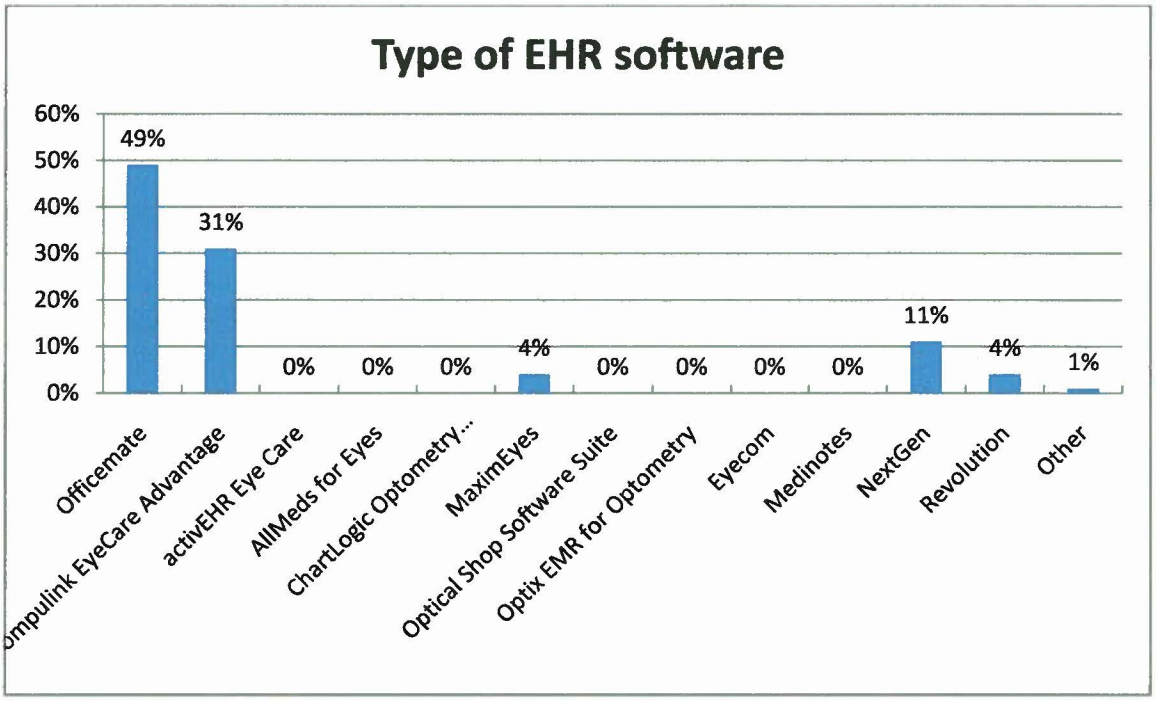

***Figure** 7 - Types of EHR software used by optometrists*

Challenges Present with Using EHRs

Those using EHRs were also questioned about challenges associated with using electronic records. Participants were asked to rank the following six concerns from least to greatest: extra expense of establishing EHR, difficulty in learning a new system, concerns of security issues, difficulty in bridging gap between paper records and EHRs, having adequate software support, and the additional time required to establish electronic records. *Figure 8* demonstrates the greatest challenges indicated by those using EHRs. Each challenge listed above was ranked by each subject and assigned a numerical value, an integer between 1 and 6 (1 being the greatest challenge of the six choices). *Figure 9* ranks these challenges on a normalized scale where 1.0 is the greatest challenge and 0.0 is the smallest challenge (based on the sum of the numerical responses to each of the six

categories). It is apparent that learning how to use a new system and the additional time required to setup EHRs were the two largest concerns among those questioned.

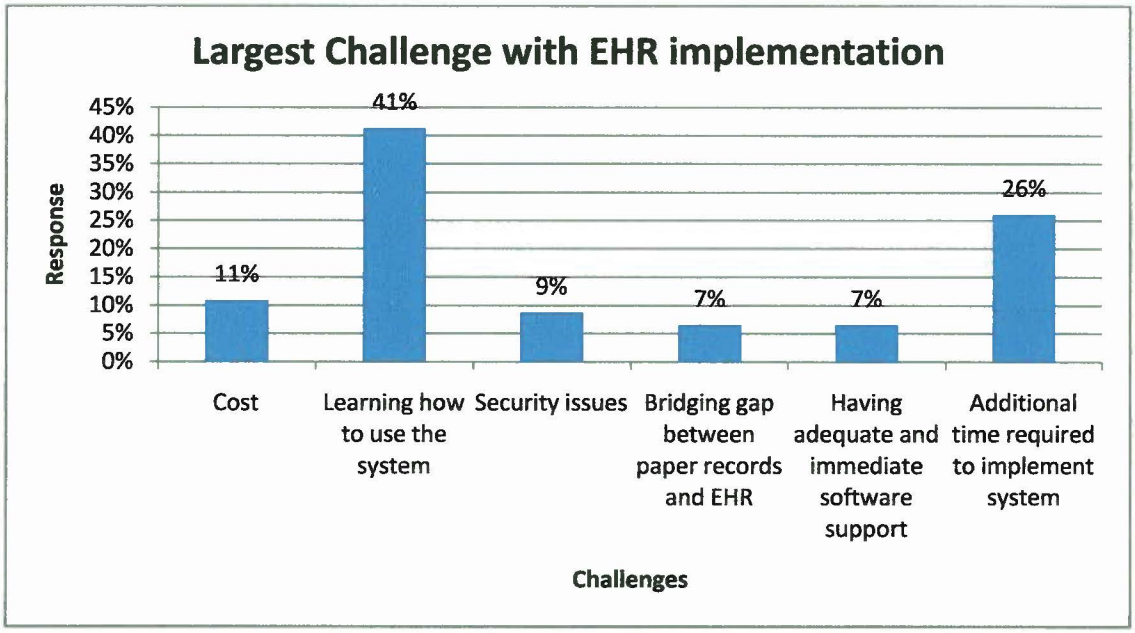

***Figure 8** - Largest challenge with EHR use for optometrists currently using electronic records*

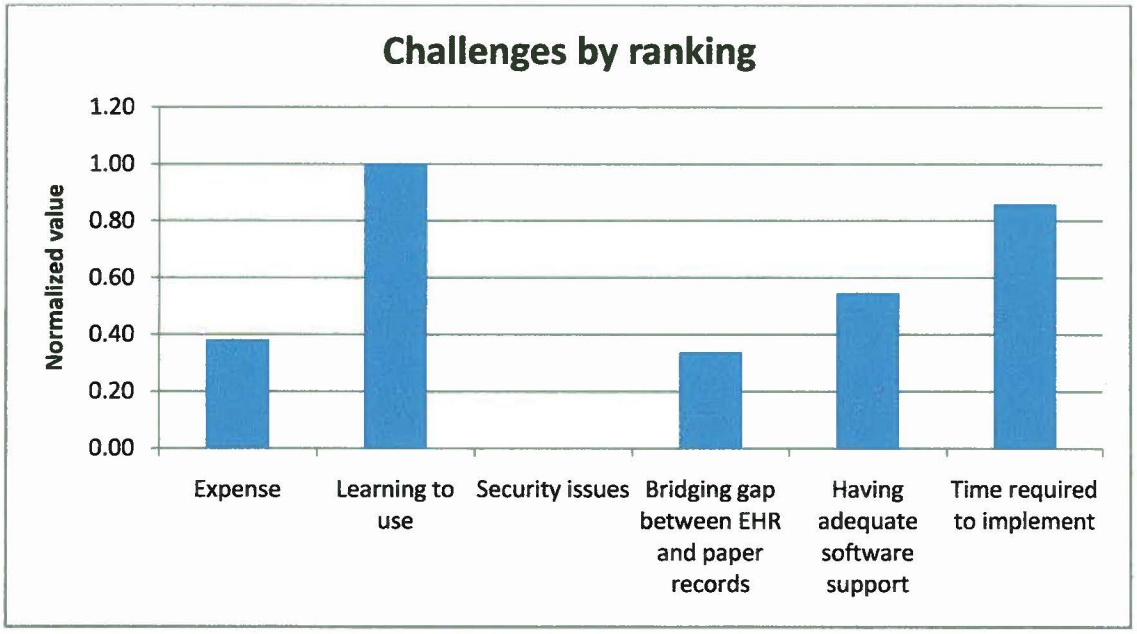

***Figure 9** - Ranking of challenges with EHR use for optometrists currently using electronic records, based on a normalized scale where 1.0 indicates the greatest challenge and 0.0 indicates the smallest challenge*

Medicare Incentive Program's Influence on Decision to Implement EHRs

Another purpose of this study was to identify whether the Medicare incentive program had any bearing on the optometrist's decision to implement EHRs. All of those who completed the survey were aware of the government incentive program; however, 7% of those who have EHRs do not plan on using the incentive program. One limitation to this survey was that questions regarding the reasons for not using the Medicare Incentive Program were not addressed.

Productivity

Optometrists were also questioned about how their productivity has been influenced since they started using electronic records. A majority (36%) of those who responded indicated that their productivity has not changed since implementation of EHRs. Twenty nine percent indicated a decrease in productivity while 36% indicated an increase in productivity. *Figure 10* illustrates responses to this inquiry.

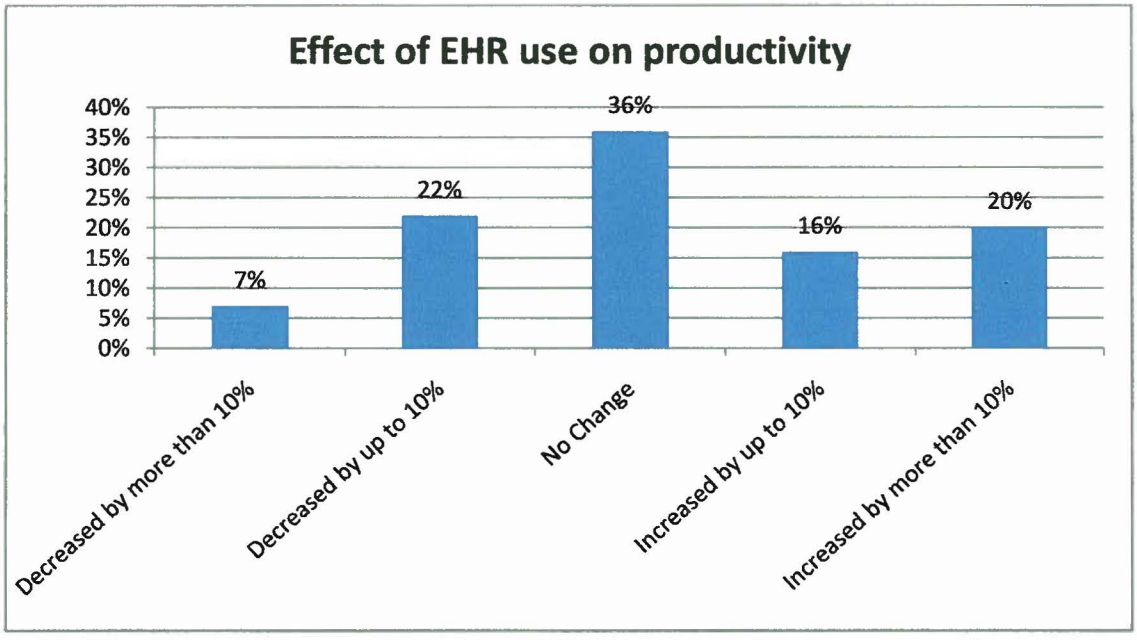

Figure 10 *- Effect on productivity since implementation of EHRs*

Systems tried and duration of EHR use

Participants currently using EHRs in their workplace were asked to indicate how many systems they have tried and how long they have been using the current EHR software. *Figures 11* and *Figure 12* display these results. Optometrists who have not implemented EHRs were asked how many systems they have used, which is displayed in *Figure 13*. Approximately 96% of optometrists surveyed currently using EHR systems have attempted two or less records system. In the same group, nearly half (49%) have been using EHR for more than three years and 51% have been using EHR for less than two years.

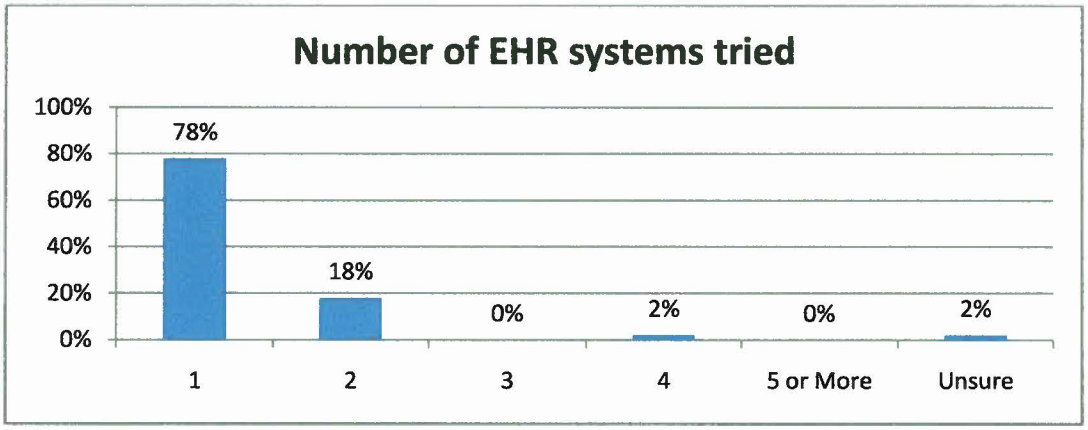

Figure 11 *- Number of EHR systems tried before implementation*

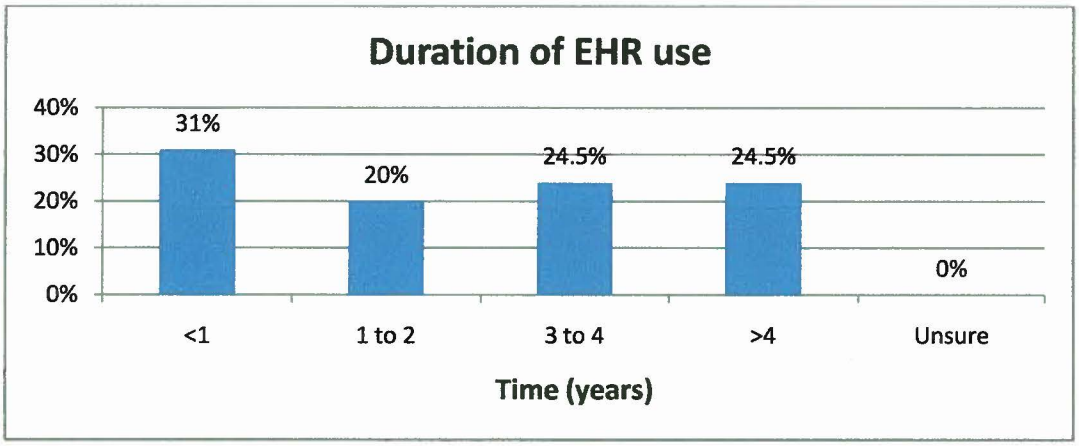

Figure 12 *- Duration of EHR usage by optometrists in their workplace*

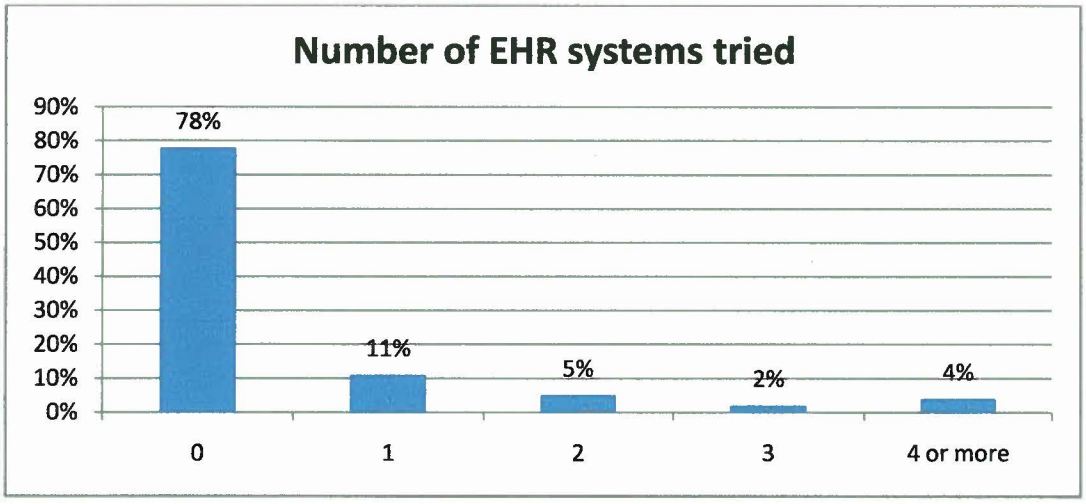

Figure 13 *- Number of EHR systems tried by optometrists who have not yet implemented EHRs*

Discussion

The aim of this project was to identify the challenges and concerns with electronic records implementation in optometry. The following sections address the implications of the results discussed previously.

Age

The results of this survey suggest that age is not a discriminating factor with regards to implementing EHRs. Unfortunately the survey was only completed by optometrists who are presently members of the Michigan Optometric Association

(accounting for 8% of optometrists in Michigan). As such, the results are not completely representative of all optometrists practicing in the state of Michigan.

Mode of Practice

The results suggest that optometrists practicing in private practices (solo, partnership, or group) are all equally likely to be using EHRs. Only 6% of doctors working in commercial settings reported using electronic records. This may be due to the practicality in managing EHRs in a retail setting due to cost, training of staff, lack of Medicare patients, and/or other limitations.

Reasons for Not Implementing EHRs

For those who do not use electronic records at this time, the survey inquired about reasons for them not being implemented. The greatest concern, at nearly 50%, was the additional cost of setting up a new system and the time required to do so. Although the federal government has established a means of rewarding those who implement EHRs in a timely manner, the cost to set up an EHR system and the time needed during the transition are the greatest concerns amongst those surveyed.

Time Frame for Implementing Electronic Records

Around 68% of those who do not have electronic health records plan on implementing them in their practices within the next two years. Interestingly, this falls in line with the deadline established by CMS to penalize those not using EHRs. The upfront incentive money may not have as much of an influence on a doctor's decision to implement electronic records as the threat of penalization for not doing so.

Anticipated and Actual Setup Costs

The results discussed previously suggest that doctors who currently use EHRs spent more money on establishing them than what doctors would anticipate spending on them who do not use electronic records presently. This indicates that there may be some unforeseen costs with the initial set up, or those who plan on implementing EHRs are not fully aware of all the costs and factors associated with implementation.

Types of EHR Systems Currently in Use

The two major systems used at this time are Officemate and Compulink Eyecare Advantage. Whereas these two systems are used by most of the optometrists questioned, it is likely that these software packages will dominate in optometric practices over the next several years.

Challenges Present with Using EHRs

The two greatest challenges in transitioning to electronic medical records were learning how to use a new computer system and the additional time required to setup EHRs. This suggests that there is a steep learning curve after initial set up; however, ongoing problems such as troubleshooting and security issues are not as much of a concern.

Medicare Incentive Program's Influence on Decision to Implement EHRs

Another aim of this study was to identify whether the Medicare incentive program had any bearing on the optometrist's decision to implement EHRs. The results suggest that many of those using EHRs plan on using the incentive program. Whether their decision to start using them was based on the financial benefit of doing so is undetermined by this study. Interestingly all of those who plan to implement EHRs are

aware of the incentive program and most plan to start using them prior to the 2014 deadline established by CMS.

Productivity

Optometrists were also questioned about how their productivity has been influenced since they started using electronic records. A large percentage indicated that productivity had not changed at all, and nearly a third indicated that it had actually decreased. The added time associated with learning to use the system may be contributing to the decrease in productivity for practices that have just recently started using EHRs. Decreased productivity may not be as great of a concern in several years after more practices have become more familiar with operating electronic records. Furthermore, the use of paper records in addition to electronic records may account for some of the reduced productivity. As practices rely less on paper records and more on electronic records over the years to come, productivity may even increase.

Systems tried and duration of EHR use

Of the optometrists currently using EHR in their workplace, all reported to have tried two or less different software packages. It is plausible that this is due to Officemate and Compulink Eyecare dominating the EHR software industry. It appears that there is roughly the same amount of optometrists implementing EHR every year based on a near-even distribution of the duration.

Conclusions

As mentioned previously, the purpose of this study was to explore the challenges encountered with electronic health record use and to identify the reasons EHRs have not

been implemented in certain practices. The use of electronic records showed very little dependence on the age of the doctor. It could be anticipated older doctors who plan on retiring soon would not be interested in implementing EHRs, this survey suggests that this may not be the case. Unfortunately, we surveyed only 8% of the practicing optometrists in the state of Michigan which would suggest that this result may not be totally representative of all practicing optometrists. Additionally, the only mode of practice that showed a significant deficiency in EHR use was commercial practices. This indicates that there may be more freedom or incentive in instituting EHRs in private practices.

One recurring concern among those who use EHRs and those who do not, is that learning to use them is very time demanding. As is the case when any new technology is incorporated into a practice, the concern of additional time upfront is not overly surprising. Another major concern was the additional expense associated with electronic records. This indicates that other issues that may have a longer lasting effect on the effectiveness of the practice (ie security issues and having immediate software support) are not as concerning.

Whereas cost was a concern for those who have not implemented electronic records, a large part of those using EHRs were unsure of their expenditures on electronic records. Additionally, the anticipated cost to implement EHRs for those without electronic records was lower than the actual cost of setup indicated by those with systems in place. This indicates that there are likely unforeseen costs in setting up an EHR system.

Finally, this study tried to identify the impact of the CMS incentive program on doctor's decisions to implement electronic records. Many responses were unsupportive of the program, but most doctors are currently using, or plan on using it. Also, most of those anticipating use of electronic records plan on doing it within the next 24 months, which coincides with the timeframe where practices will be penalized for not using them.

REFERENCES

1. DeBry, P.W. Considerations for choosing an electronic medical record for an ophthalmology practice. Arch Ophthalmol. 2001; 119:590-596.
2. Gurley, L. Advantages and disadvantages of the electronic medical record. http://www.aameda.org/MemberServices/Exec/Articles/spg04/Gurley%20article.pdf Date accessed: 2011 Apr 20.
3. Webb, J.A. EMR systems pose some challenges: remember that there is a learning curve and training required. Ophth. Times. 2005 Jun 1;61-62.
4. CMS Medicare and Medicaid EHR incentive programs milestone timeline. https://www.cms.gov/EHRIncentivePrograms/.../EHRIncentProgtimeline508V1.pdf Accessed: 2011 Apr 20 Updated: 2011 Apr 18.
5. The official web site for the Medicare and Medicaid electronic health records incentive program. https://www.cms.gov/ehrincentiveprograms/ Accessed:2011 April 20 Update: 2011 Apr 18.

APPENDIX A

SURVEY QUESTIONS

1. What type of practice do you have (If multiple practices, which do you spend the most time at)?
    a. Commercial/retail
    b. Optometry/ophthalmology
    c. Solo
    d. Partnership (2 or 3 ODs)
    e. Group (4 or more ODs)
2. Your age:
    a. 21-30
    b. 31-40
    c. 41-50
    d. 51-60
    e. >60
3. Is your practice currently using Electronic Health Records (EHR)?

    Y N

    If no, please skip to **question 15**

4. Which of the following EHR programs are being utilized at the practice (select all that apply)?
    a. Officemate
    b. Compulink EyeCare Advantage
    c. activEHR Eye Care
    d. AllMeds for Eyes
    e. ChartLogic Optometry Electronic Medical Office
    f. MaximEyes
    g. Optical Shop Software Suite
    h. Optix EMR for Optometry
    i. Eyecom
    j. Medinotes

k. NextGen
l. Revolution
m. Other _____

5. How much has the practice spent on establishing an EHR system (including any computer upgrades or necessary computer purchases)?
    a. Less than $10,000
    b. $10,001 to $25,000
    c. $25,001 to $40,000
    d. $40,001 to $70,000
    e. $70,001 to $100,000
    f. More than $100,000
    g. Unsure
6. How often does your EHR system go down (i.e. needs troubleshooting)?
    a. Less than once a month
    b. Once every one to two months
    c. A few times a year
    d. Seldom
7. How long has the practice used EHR?
    a. Less than a year
    b. 1 to 2 years
    c. 3 to 4 years
    d. More than 4 years
    e. Unsure
8. How many different EHR systems has the practice used?
    a. 1
    b. 2
    c. 3
    d. 4
    e. 5 or More
    f. Unsure
9. How many computers are equipped with an EHR system?
    a. 1-2

b. 3-4

c. 5-6

d. 6-7

e. 8 or more

10. Do you still use paper charts in addition to EHRs?

a. Yes

b. No

11. Will your practice utilize the Medicare EHR incentive program?

a. Yes

b. No

12. How has your productivity been affected since the implementation of EHRs?

a. Decreased by more than 10%

b. Decreased by up to 10%

c. No Change

d. Increased by up to 10%

e. Increased by more than 10%

13. Rank the following challenges in the transition to EHR, (1=largest challenge, 6=smallest challenge):

a. Cost

b. Learning how to use the system

c. Security issues

d. Bridging gap between paper records and EHR

e. Having adequate and immediate software support

f. Additional time required to implement system

14. How long has it taken the practice to become efficient in the implementation of EHR?

a. Less than 6 months

b. 6 to 12 months

c. 12 to 18 months

d. 18 to 24 months

(This would be the end of the survey for those using EHRs)

15. Why are you NOT using EHRs currently (select all that apply)?
    a. Expense
    b. Time
    c. Lack of information
    d. Have not identified the right software
    e. Don't have computers to support EMR software
    f. No interested in learning how to use new technology
    g. Other _____
16. Do you have plans on getting EHRs, if so when?
    a. Do not plan on implementing EHRs
    b. Less than 6 months
    c. Between 6 and 12 months
    d. Between 12 and 18 months
    e. Between 18 and 24 months
    f. More than two years
17. Are you aware of the government EHR incentive program?
    a. Yes
    b. No
18. Have you been exposed to any EHRs?
    a. Yes
    b. No
19. How much do you anticipate on spending on the EHR system?
    a. Less than 10,000
    b. 10,001 to 25,000
    c. 25,001 to 40,000
    d. 40,001 to 70,000
    e. 70,001 to 100,000
    f. More than 100,000
    g. Do not plan on implementing EHR system

20. How many EHR systems have you tried?

a. 0
b. 1
c. 2
d. 3
e. 4 or more