

Grant Final Report

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**Rural Community Partnerships—
EMR Implementation Project**

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Abstract

None provided.

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Final Report

Purpose

The project's specific purpose and aim was to implement an Ambulatory Electronic Medical Record (AEMR) in multiple, rural primary and specialty care provider settings managed by Magic Health Partners, L.L. C. (MHP) and Magic Valley Regional Medical Center (MVRMC) via Magic Healthcare Partners (MHCP). In addition, critical to the ongoing success, was the incorporation of the College of Southern Idaho (CSI) which was asked to integrate AEMR case scenarios into the curricula of the Health Sciences and Human Services Department to ensure that future healthcare providers would have adequate training and exposure to AEMR technology. Each member committed to utilization of this technology with the objective of improving overall patient and provider access to high quality care and information. MVRMC provided expertise and leadership for the AEMR implementation; it is the largest, most comprehensive rural hospital in the service area.

The following hypotheses were postulated for this project:

1. Rural AEMR implementation and integration with human factors will result in an increase in the efficiency of patient data verification versus chart pulls.
2. Rural AEMR implementation will increase the numbers of patients seen for immunizations, wellness screening, and proactive acute chronic condition management.
3. Rural AEMR implementation will reduce the overall costs of transcription, expenditures on office supplies, costs related to filing expenses, and will reduce the number of lost charges.
4. Rural AEMR implementation in MHCP and MHP managed practice setting will increase additional primary and specialty care provider interest in AEMR implementation.
5. Rural AEMR implementation will improve technological skills and exposure of graduates transitioning from CSI to the workforce as a result of the AEMR integration in to the curricula.

Key objectives were measured to determine the impact of the health information technology implementation as it related to clinical practice, organization structure and financial benefits relating to the hypotheses. Each of the above stated hypotheses was tied directly to overarching partnership goals, measurable objectives, and activities related to the implementation of AEMR by each of the participating institutions.

The partnership's four overarching strategic goals include the following;

1. Implement AEMR in 18 rural primary and specialist care practices managed by MHP and MHCP via MVRMC to improve medical accuracy, improve patient safety processes, and facilitate non duplicated tracking and reporting of care services provided to patients located in south central Idaho and northern Nevada;
2. Implement AEMR to facilitate and enhance community wellness via immunizations, screening, and proactive acute chronic condition management within MHP providers via MVRMC;
3. Improve overall business related outcomes following AEMR implementation by reducing the overall costs of transcription, expenditures on office supplies, costs related to filing expenses, and minimize the number of lost charges at MHP and MHCP via MVRMC;
4. Implement and integrate AEMR functionality case scenarios into CSI Health Science curricula to ensure healthcare provider preparedness for transitioning into workplaces with healthcare information technology systems.

Scope

The preferred system that was implemented to facilitate the AEMR is the Centricity product from GE Medical Systems (GEMS). The EMR Centricity product from GEMS was purchased by GE under the name of Medicalogic. This product has been viable and utilized over a fifteen year period and was originally developed by clinicians. It is a clinician- centered product that is both intuitive and efficient which allows end-user customization while ensuring the standardization of patient information collection. MVRMC utilized Inland Northwest Health Systems as the vendor to facilitate implementation and support to significantly reduce the cost for the EMR Centricity product.

Methods

Preliminary data was gathered during the planning period for the implementation of the AEMR with MHP and MHCP. During a single thirty day period, the primary document for patient care was reported 12,671 charts "pulled." This is significant since the total number of patients served monthly by MHP is between 6800-7100 non-duplicated patients with an additional 400 new patients. Each patient may have more than one encounter per month depending on the disease. The charts were pulled which gives rise to the potential for the chart to be unavailable at the point of care. It also represents a significant cost in labor to continually pull and return charts.

The charts were “pulled” because they had been pulled by staff for the following routine patient care tasks:

- Phone messages – 1830
- Encounter forms – 6711
- Triage – 29
- Lab orders – 40
- Nurse call back – 256
- Lab basket – 851
- Phone calls – 427
- Receptionist scheduled call back – 555
- Medication refill – 1099
- Healthy connections – 158
- Behavioral Health – 216
- Coumadin charts – 97
- MR release – 213
- Storage – 9
- Others – 130

The potential for point of care issues related to missing charts was significantly increased by the routine practice of pulling charts to complete all of the above tasks. The need for improved verification and access is central to high quality care.

Focusing on delivering the right information at the right time at the right place is a key driver for the implementation of the AEMR. It was vital that an integrated model supporting the inpatient hospital and outpatient physician office information systems be architected. Providing tools for the healthcare provider that facilitated compliance with healthcare standards was imperative. This included ensuring the technology would support the CMS Hospital Quality Initiative by aiming to refine and standardize the data. All parties participating in the project were acutely aware they were entrusted to provide an essential public service in a safe, timely, effective, efficient, equitable, and patient centered fashion. Knowing that current state was operation in a very complex and fragmented delivery system, with tools and technology with

which to manage being primitive by most modern standards fueled everyone's desire even more to successfully implement an AEMR.

Results

1. Rural AEMR Implementation and Integration with Human Factors Will Result in an Increase in the Efficiency of Patient Data Verification Versus Chart Pulls

Results of doing pre and post implementation analysis of medication, allergy and problem lists being documented completely and accurately are shown below. In all but two cases, all components saw a marked improvement in presence and accuracy in the chart. In the two cases, Physician Center and Dr. Christensen, there was a decrease seen in documentation completeness and accuracy for the patient problem list. This was due to inadequate codifiable choices for the physician to select from in the AEMR. This was rectified quickly as those physicians identified the missing choices from the selection list of problems.

Figure 1. Physician center patient data integrity verification baseline to post live comparison

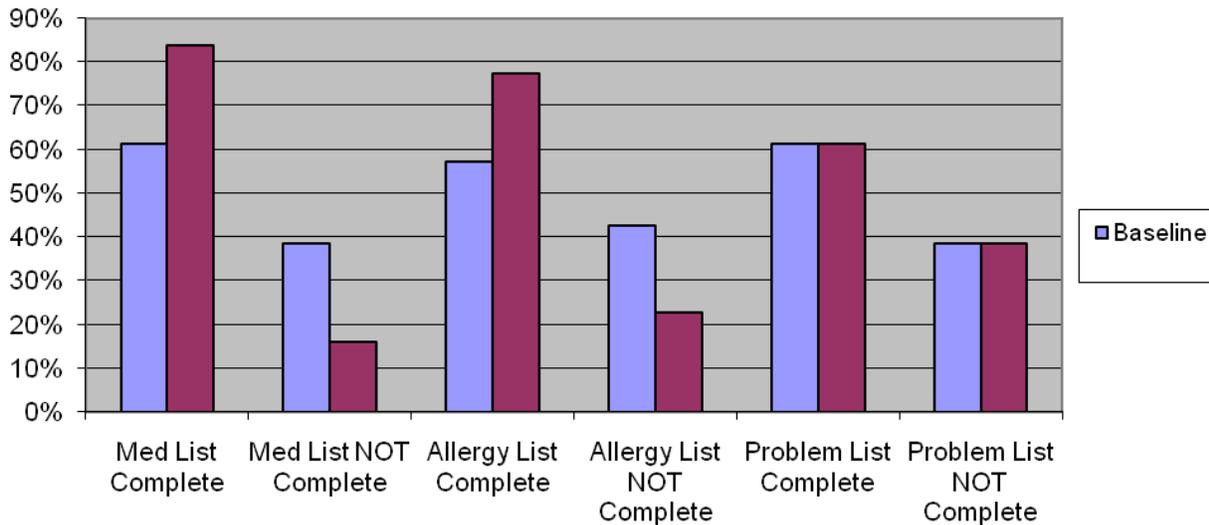


Figure 2. Dr. Miciak patient data integrity verification baseline to post live comparison

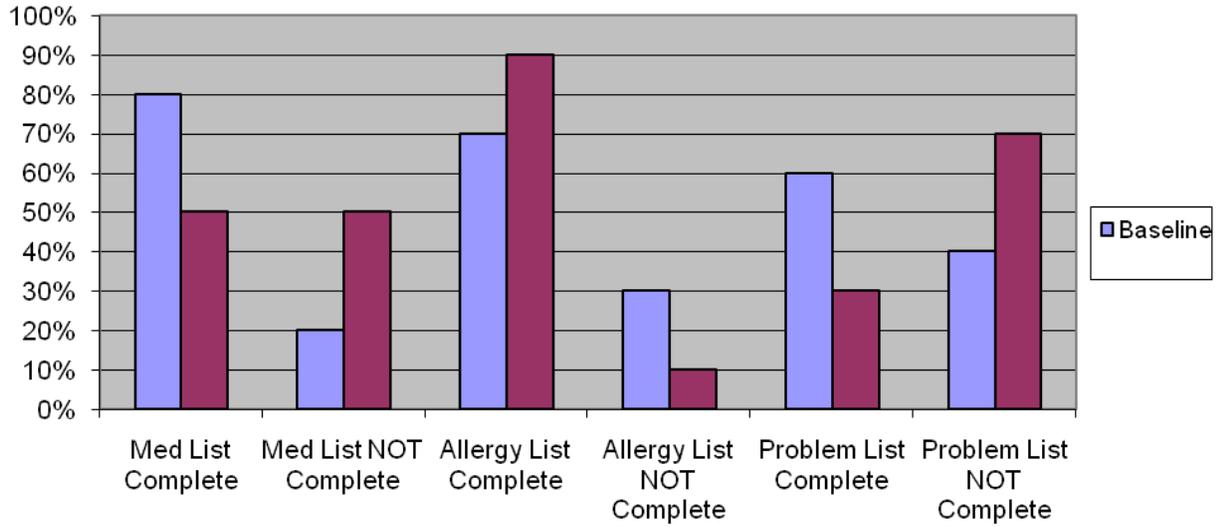


Figure 3. Dr. Fullmer patient data integrity verification baseline to post live comparison

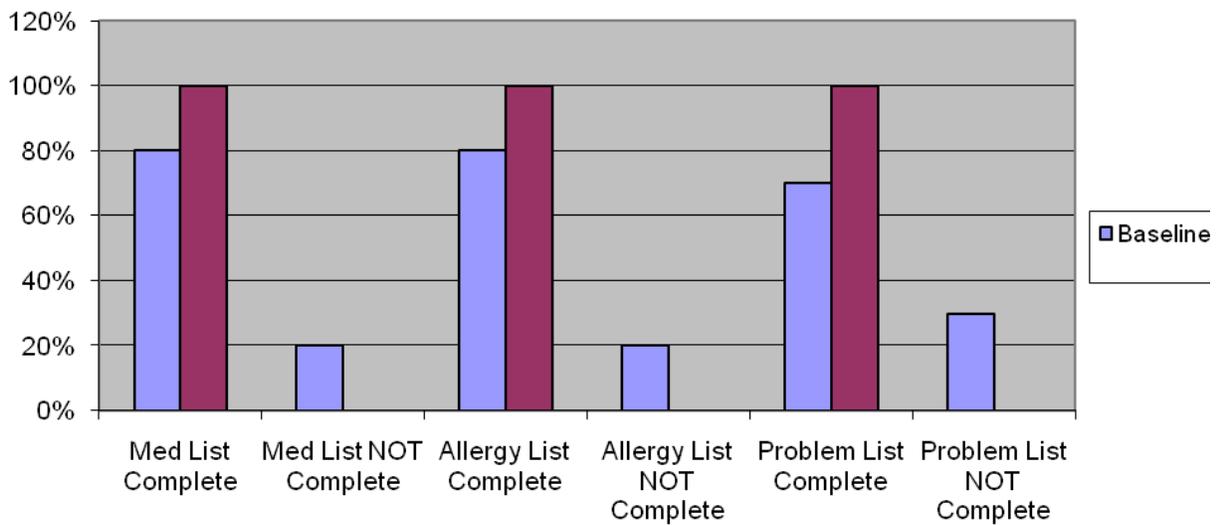


Figure 4. Dr. Christensen patient data integrity verification baseline to post live comparison

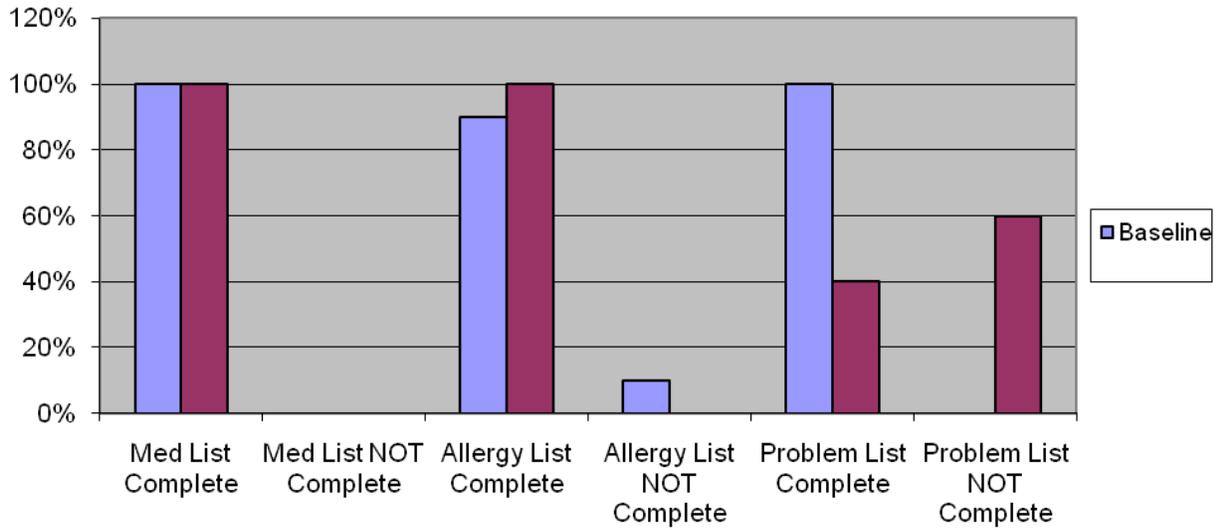


Figure 5. Dr. Shuss patient data integrity verification baseline to post live comparison

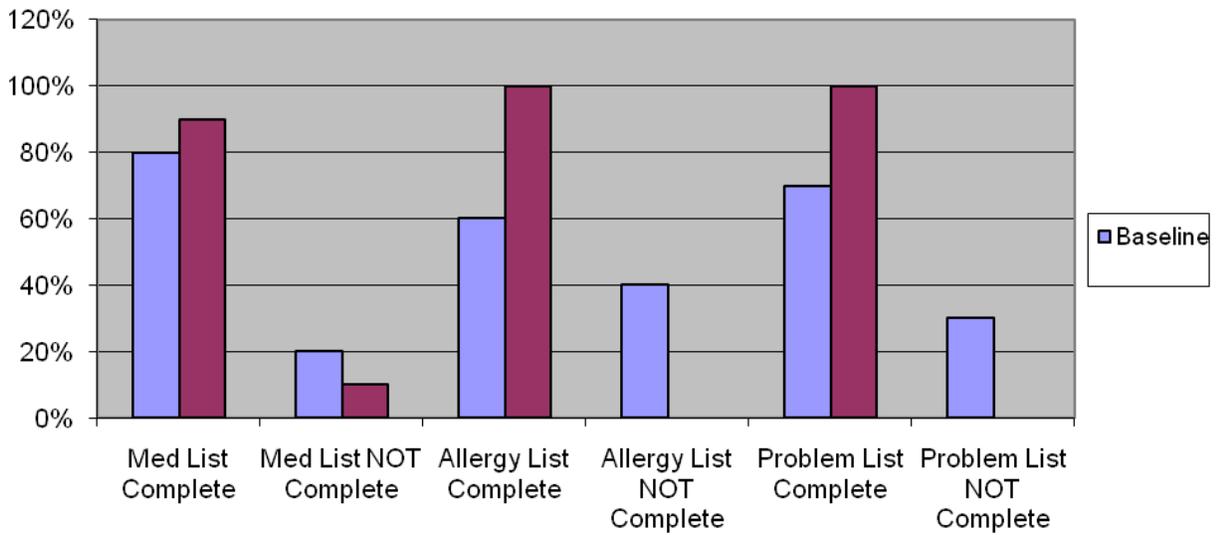


Figure 6. Snake River Internal Medicine patient data integrity verification baseline to post live comparison

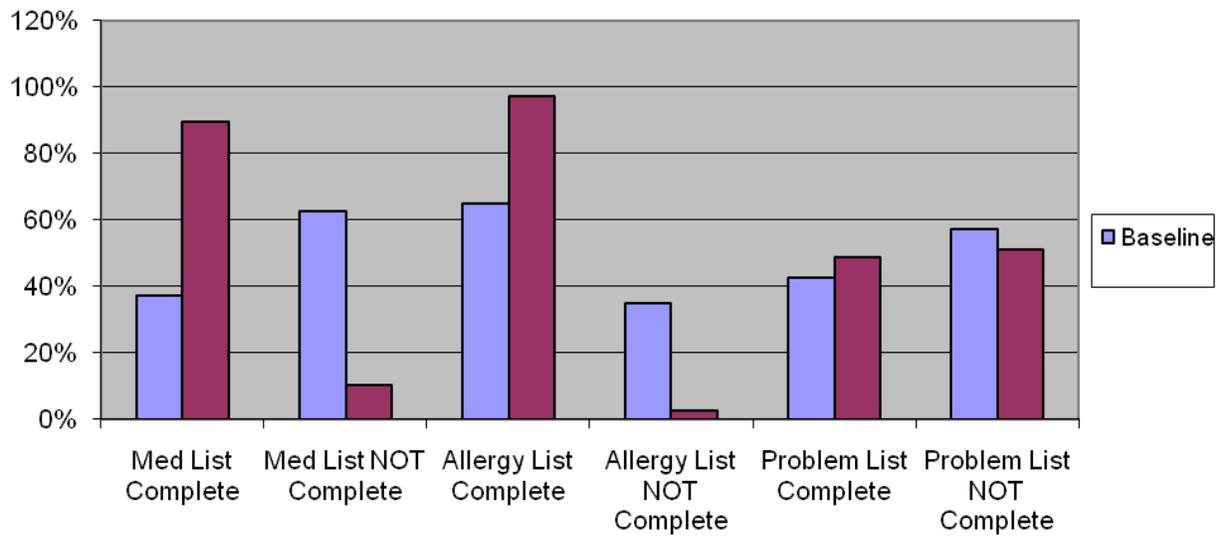


Figure 7. Idaho Medicine Associates patient data integrity verification baseline to post live comparison

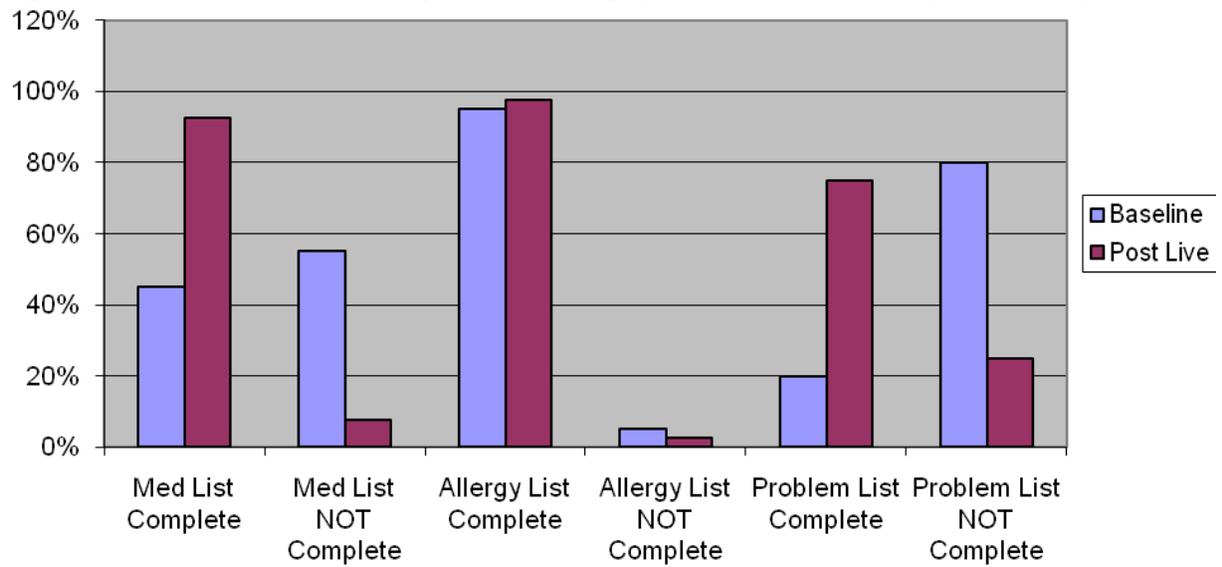
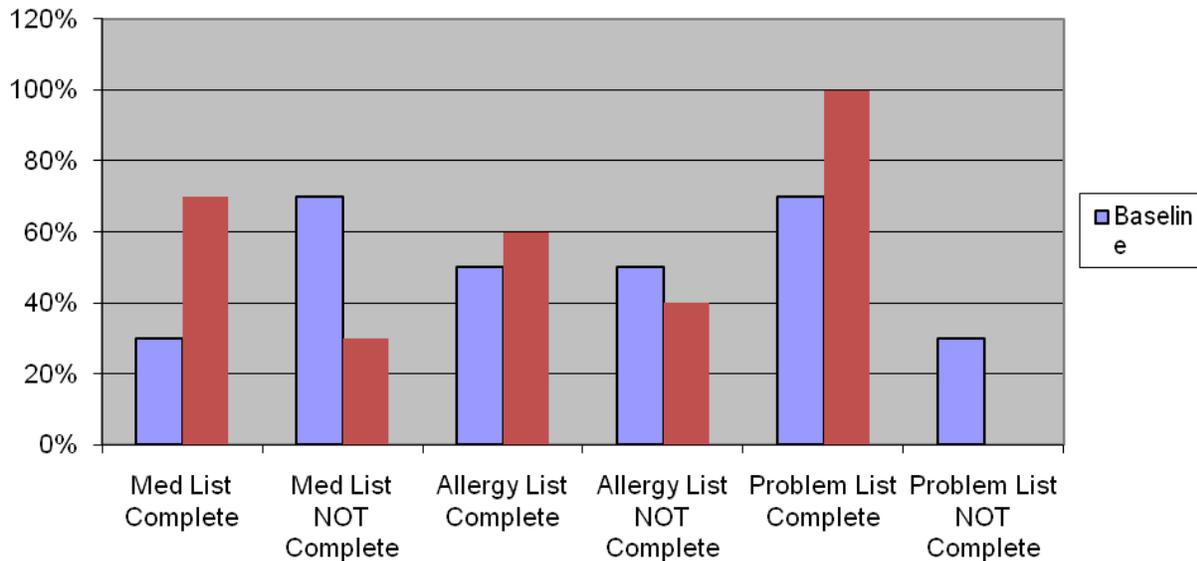
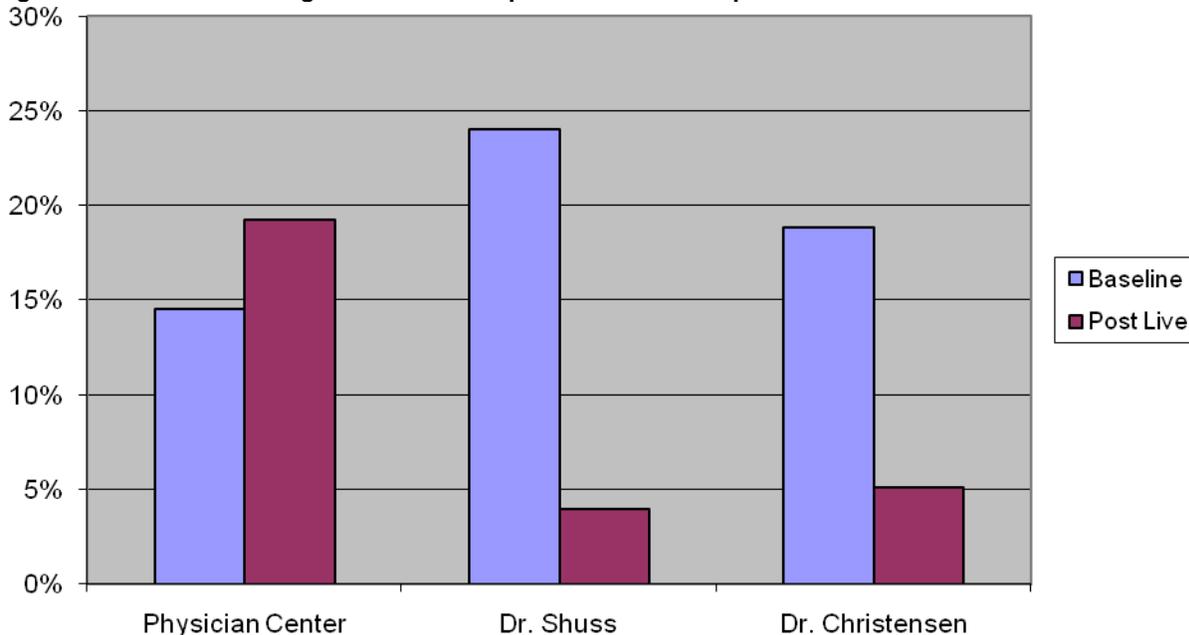


Figure 8. Dr. Waters patient data integrity verification baseline to post live comparison



Documentation of patient encounters without chart access & documentation of requests for additional information not found in the patients chart was also analyzed pre and post implementation. The lesson learned with Physician Center was to have the scanning solution in place doing back scanning at least 30 days prior to live and making sure there was enough staff to keep up with the back scanning to keep patients entered into the AEMR for their first “electronic” visit at least 72 hours prior to their scheduled appointment. This process was utilized for Dr. Shuss and Dr. Christensen and significant improvement in charts not having missing information was realized.

Figure 9. Chart with missing information comparison baseline to post live



2. Rural AEMR Implementation Will Increase the Numbers of Patients Seen for Immunizations, Wellness Screening, and Proactive Acute Chronic Condition Management

3. Rural AEMR Implementation Will Reduce the Overall Costs of Transcription, Expenditures on Office Supplies, Costs Related to Filing Expenses, and Will Reduce the Number of Lost Charges

Initial focus on transcription costs revealed instant cost savings so continual monitoring was not put in place. A decision to not monitor office supplies and filing expenses was made in order to spend the time focusing on developing an ROI model for the purchase and implementation of the system. Please refer to the following documents that are sent with this report. This research and ROI modeling was published in the Winter 2006 Journal of Healthcare Information Management.

- JHIM 2005 MANUSCRIPT 110605.doc
- Exhibit 3-1.doc
- Exhibit 5-1 v2.xls
- Exhibit 5-2.xls
- Exhibit 5-3.xls
- Exhibit 6-1.xls

4. Rural AEMR Implementation in MHCP and MHP Managed Practice Setting Will Increase Additional Primary and Specialty Care Provider Interest in AEMR Implementation

Physician satisfaction surveys were conducted pre and post implementation to determine level of satisfaction and discrete improvements in work life. Overall satisfaction with the AEMR system and its impact on their work life was seen.

Table 1. Physician satisfaction survey

Survey component	Change from baseline to post live	Summary
Q1 - Estimate number of hours worked per week. Busy Time of Year vs. Light Time of Year: Office Patient Care	-6.83	
Q1 - Estimate number of hours worked per week. Busy Time of Year vs. Light Time of Year: Procedure Patient Care	9.50	

Table 1. Physician satisfaction survey (continued)

Survey component	Change from baseline to post live	Summary
Q1 - Estimate number of hours worked per week. Busy Time of Year vs. Light Time of Year: Paperwork	1.67	
Q1 - Estimate number of hours worked per week. Busy Time of Year vs. Light Time of Year: Phone/Messages	-0.45	
Q1 - Estimate number of hours worked per week. Busy Time of Year vs. Light Time of Year: Other	-4.50	
Q1 - Estimate number of hours worked per week. Busy Time of Year vs. Light Time of Year: Total Hours	-3.32	Of most interest is the fact that total hours spent working in the office decreased by 3.32 hours/week. Surprisingly however, the amount of time spent per week on paperwork increased by 1.67 hour/week. This was mainly attributed to the initial few months of implementation spent reviewing the "old" paper chart and comparing the content to the electronic record before signing off that the paper chart could be retired and stored permanently. Another advantage seen was the increase in hours spent on procedural patient care which generates more revenue for the physician in correlation with the ability to spend less time in the office per week
Q2 - How many patients do you see a day?	-2.88	Overall, the physicians are seeing approximately three less patients per day. The physicians are not dissatisfied with this measure and feel that over time they will be able to recover this time as they become more proficient with the AEMR technology.
Q3 - What time do you typically go home (non-call)? Earlier than baseline	5	
Q3 - What time do you typically go home (non-call)? Later than baseline	4	Of the nine physicians completing this question on the survey five are going home earlier with the AEMR in place vs. four going home later.
Q4 (rate on a scale of 1-5) - The current availability of patient information	1.0	On a scale of 1 (unavailable) to 5 (always available) the rating improved a complete point.
Q5 (rate on a scale of 1-5) - The current availability of clinical reference information	.20	On a scale of 1 (unavailable) to 5 (always available) the rating improved a .2 of a point.
Q6 (rate on a scale of 1-5) - Currently, what is the likelihood of critical information finding you (rather than having to seek it out)?	.1	On a scale of 1 (unavailable) to 5 (always available) the rating improved a .1 of a point.
Q7 (rate on a scale of 1-5) - Integrity/trustworthiness of current data	-.10	On a scale of 1 (unavailable) to 5 (always available) the rating declined by a .1 of a point..
Q8 (rate on a scale of 1-5) - Rate your current degree of overall satisfaction with your current medical records system	.56	On a scale of 1 (unavailable) to 5 (always available) the rating declined by .56 of a point.
Q9 (rate on a scale of 1-5) - Rate your satisfaction with the way your office handles: Phone Messages	0.20	
Q9 (rate on a scale of 1-5) - Rate your satisfaction with the way your office handles: Charting	0.40	

Table 1. Physician satisfaction survey (continued)

Survey component	Change from baseline to post live	Summary
Q9 (rate on a scale of 1-5) - Rate your satisfaction with the way your office handles: Lab Results	0.44	
Q9 (rate on a scale of 1-5) - Rate your satisfaction with the way your office handles: Intra-Office Communication	0.90	
Q9 (rate on a scale of 1-5) - Rate your satisfaction with the way your office handles: Scheduling	-0.17	Overall improvement was seen in all areas of communication that are handled via functionality in the AEMR with the exception of scheduling which is not originated in the AEMR.
Q10 (scale of 1-5) - Degree of repetitive data	-0.33	There was a decline in satisfaction with having to re-enter repetitive data in the AEMR. This was rectified by the development and implementation of structured documentation templates.
Q11 (scale of 1-5) - How does the current clinical information tools impact quality of care that you provide?	-0.29	The difficulty the physicians were experiencing was the age old question of where do I find the information. By structuring the electronic chart more to the viewing liking of the physicians by specialty this was rectified.
Q12 - I currently personally look for patient information using: Printed/ Paper Schedule	63%	
Q12 - I currently personally look for patient information using: Chart/ Printed lab pages	89%	
Q12 - I currently personally look for patient information using: Computer X-ray	10%	
Q12 - I currently personally look for patient information using: Computer e-mail	60%	
Q12 - I currently personally look for patient information using: Computer Lab results	43%	
Q12 - I currently personally look for patient information using: Written phone messages	78%	
Q12 - I currently personally look for patient information using: Direct conversation with nurses and providers	22%	
Q12 - I currently personally look for patient information using: Computer-Patient demographics	250%	
Q12 - I currently personally look for patient information using: Computer-scheduling information	40%	Significant improvement post implementation of the AEMR was seen in the physician behavior of accessing the computer system for patient/clinical information. This is one of the key indicators of success, as if the system was not providing valuable information the physicians would not be using it.
Q13 - Besides on-call, I do/do not take home office work	-25%	Of those surveyed, 4 took home work pre-implementation and 5 took home work post-implementation. There is not one defining attributable factor to this outcome. All physicians agreed they were able to complete their chart documentation prior to leaving the office in the afternoon/evening. Most admitted to getting on-line at home at night and checking status of their inpatient population.

Patient satisfaction surveys were also conducted to determine level of improvement in processes that the AEMR could facilitate and its impact on patient satisfaction.

Table 2. Patient satisfaction survey questions

Question	2004 score	2005 score	2006 score
Ease of scheduling appointment at a convenient time: 1 = Outstanding, 2 = Excellent, 3 = Good, 4 = Fair, 5 = Poor	1.87	2.02	1.89
Quality of your visit: 1 = Outstanding, 2 = Excellent, 3 = Good, 4 = Fair, 5 = Poor	1.76	1.80	1.89
Did you receive the help you expected from today's visit? 1 = More than expected, 2 = What was expected, 3 = Less than expected, 4 = Not sure	1.64	1.67	1.71
Were you satisfied with the explanation(s) and education materials given to you at this visit? 1 = Yes, 2 = Somewhat, 3 = Not at all, 4 = Not Sure	1.08	1.61	1.11
Reception services (Staff's helpfulness, professionalism and courtesy): 1 = Outstanding, 2 = Excellent, 3 = Good, 4 = Fair, 5 = Poor, 6 = NA	1.80	1.64	1.62
Nursing Services (Staff's helpfulness, professionalism and courtesy): 1 = Outstanding, 2 = Excellent, 3 = Good, 4 = Fair, 5 = Poor, 6 = NA	1.67	1.61	1.67
Billing Services (Staff's helpfulness, professionalism and courtesy): 1 = Outstanding, 2 = Excellent, 3 = Good, 4 = Fair, 5 = Poor, 6 = NA	2.43	2.24	2.55
Phones (Staff's helpfulness, professionalism and courtesy): 1 = Outstanding, 2 = Excellent, 3 = Good, 4 = Fair, 5 = Poor, 6 = NA	2.5	2.47	2.64
Doctor/NP (Staff's helpfulness, professionalism and courtesy): 1 = Outstanding, 2 = Excellent, 3 = Good, 4 = Fair, 5 = Poor, 6 = NA	1.54	1.43	1.78

5. Rural AEMR Implementation Will Improve Technological Skills and Exposure of Graduates Transitioning from CSI to the Workforce as a Result of the AEMR Integration into the Curricula

Table 3. LPN Training, October 2006

	Reason for Visit	HPI	Family History	Medications	Problems	Vital Signs
Pass Rate	75%	88%	75%	25%	38%	100%

Students went through training and then documented a case scenario in which we audited. This audit was performed as we would audit a clinician's chart and so the expectations were very high. For example, the students may have changed the med list as instructed but may not have updated the instruction line appropriately, so we would have deemed that as a Fail.

CSI Student Training Testimonials

“As an LPN student at CSI, I received training on the EMR for a clinical rotation at Snake River Internal Medicine. I was able to use the EMR a little while I was there. It was a 4 day rotation, the first 2 days were paper charting, the 3rd day was spent preloading in the EMR, and the 4th day the system went live. What

little experience I had with EMR, combined with the training session, has greatly benefited me in my position at Physician Center. Once I was able to start using EMR again, it came back to me very quickly. It helped me greatly to have that training prior to employment.”

— Erin M. Jacobson, LPN

“I went through the EMR training initially during my CSI training as an LPN. Early training, during school, was extremely beneficial when I was hired on at MVRMC SRIM because I had the training when SRIM went up on EMR. It kept me ahead of what was being learned about the basics of EMR and allowed me to advance in the system and use many other options that were not being utilized by other staff that had not been trained previously. I believe my in-school training helped me to troubleshoot for my physician and other staff members when the trainers were unable to be present and the training was done.”

— Karla Risbeck-Hardin LPN

“Mandy B. graduated from the LPN program at CSI in December of 2005 where she had been trained on the EMR. Upon hiring she needed minimal training and picked up on the program easily. She is an asset to our office.”

— Deana Candelaria, LPN, SRIM Nurse Lead

“In the Fall of 2005 I was a nursing student enrolled at the College of Southern Idaho. Before we could go out into the doctor's offices we were able to learn how to use the EMR charting system. We all ran through a brief overview of how the program worked and were shown things like how to enter vital signs, how to send and receive flags, how to add other things to the patient's chart. While in our clinical rotations we only had minimal use of the program, but in June of 2006 I was hired as a nurse by a clinic and found my prior training to be quite helpful. When I sat down and was shown how to use the EMR system, it was very easy for me to catch on and I found my prior training to be quite a useful tool. I think that having nursing students learn how to use a local hospital's charting system is a very good learning tool to show them how to document in a way besides the old paper and pen.”

— Mandy R Belveal LPN

List of Publications and Products

None indicated.