

## Ambulatory Care Application HIMSS Davies award

### Section A- Identifiers

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7. Website [www.pbobgyn.com](http://www.pbobgyn.com)
8. Number of providers:
- |                    |   |
|--------------------|---|
| Physicians         | 4 |
| Nurse practitioner | 1 |
| Nurse Midwife      | 1 |
9. Number of FTEs:
- |                 |   |
|-----------------|---|
| Check in        | 2 |
| Check out       | 2 |
| Appointments    | 2 |
| MA's            | 6 |
| Billing         | 3 |
| Administration  | 2 |
| Medical records | 1 |
| OB coordinator  | 1 |
10. Number of sites:
- |           |   |
|-----------|---|
| Offices   | 2 |
| Hospitals | 4 |
11. No formal employment relationships with any vendor of our EHR system. However, we are a demonstration site and have served as trainers for the sales force as well as consultants for other practices using our EMR system.
10. Annual Number of Patient Encounters: 41,115 in 2007  
Total number of active patients per provider 3,558
11. EHR Implementation Team: Samuel Lederman MD  
Darlenys Franco, Administrator  
Doris Rodriguez, Nursing Supervisor

## **Section B. Guidelines for Application**

### **I. The Organization**

Palm Beach Obstetrics & Gynecology PA is a full service Ob/Gyn practice in Palm Beach County, Florida offering routine women's health care services to our community. The practice was founded 15 years ago and has grown to include six providers working in two offices and four hospitals. It serves a predominantly suburban region and a diverse population, with backgrounds ranging from affluent professionals to working class. The practice offers a variety of outpatient services including annual examinations, complete Obstetrical care, Gynecological services, minor office-based procedures (LEEP biopsies, office hysteroscopy), diagnostic ultrasound and BMD (Bone Mass Density measurement) testing. We also provide Hospital ER coverage, inpatient consultations and both ambulatory and major gynecologic surgery.

About 65% of our patients are covered by managed care (either HMO or PPO) or indemnity insurance. A lesser number are self-paying (15%) and Medicare (5%). About 40% of the Obstetrical patients are covered by Medicaid, which represents a substantial portion of our office visits and total revenues.

### **II. Management**

#### **1. Business objectives**

The practice started with a single practitioner and grew over the years in an organic fashion. Operational protocols and forms were implemented and evolved slowly as the practice needs changed. From the beginning, scheduling, billing and collection functions were computerized. The addition of practitioners and a second office led to an increase in the level of complexity and many organizational challenges that our old software package could not handle. The motivation to implement an EMR system was to address the following challenges:

- Eliminate the need to look for paper charts
- Eliminate errors in reviewing labs and radiology reports
- Reduce delays in obtaining and acting on patient results
- Eliminate illegible handwriting from charts
- Eliminate incomplete documentation for billing
- Make clinical information accessible to providers on nights and weekends. The lack of access to this information was especially critical for our obstetrical cases
- Improve internal communication
- Improve documentation of phone conversations with patients
- Reduce office noise and foot traffic level
- Upgrade our existing software and hardware since they were no longer adequate for a large practice and had not been upgraded in many years. However, its reporting functions were excellent and we wanted a software package that at the very least matched this capability.

These were our most pressing logistical problems. However, we also hoped that we could make our practice more efficient and profitable. Other objectives included:

- Decrease in human resources devoted to medical records
- Decrease in expenses for office supplies
- Allow providers to work from home instead of staying late at the office
- Increase physician productivity by allowing connectivity at hospitals while waiting for a delivery or for surgery
- Make our office more environmentally friendly by decreasing paper waste

Resolving the challenges described above would improve our daily operations and our financial position. We felt that we were delivering high quality medical care, but recognized that we could do better if we could reduce clerical errors and speed up the response time to abnormal labs and

radiology reports. Accomplishing these goals would resolve most of our daily frustrations and reduce the areas of concern for both providers and staff alike.

## 2. Project Organization

### a. Leadership/Governance

#### i. Approach

Implementing the EMR all at once was not viable for our practice since we continuously have many urgent and semi-urgent situations and ongoing Obstetrical responsibilities. In addition we were concerned about the fiscal implications of a protracted decrease in productivity. As a result, we chose a phased-in approach.

#### ii. How to encourage adoption and manage change

The easiest part of the program to implement was the billing and collections module. Our old program was deficient in these areas and staff that focused on those tasks readily embraced the change. It was an opportunity to start clean and streamline our accounts receivable. The scheduling component was more challenging since it involved choosing both the provider to be seen, and also the resource to be used, such as which procedure room, ultrasound, etc. Most of the staff adapted quickly to the new program. A few employees were clearly uncomfortable with the new computer system. These were employees with few if any computer skills who had difficulty adapting to the new environment.

The most challenging group to train and encourage was the providers. Their job was clearly the most affected and they had the most to learn while still remaining productive and focused on patient care. Aside from the training provided by the company, the physician 'superuser' was readily available to answer questions. Weekly meetings were implemented to work on more difficult tasks. Each week we would choose two or three tasks to master.

#### iii. Project Governance

Greenway Medical asked us to identify five or six 'superusers' that would become resources for the rest of the practice. They also recommended setting up several teams responsible for implementing the changes in different areas within the practice. Each 'superuser' became the leader of a team. The teams included:

- Administration team  
Leadership team that had final approval of all policies, procedures and processes approved by the other teams. This group coordinated the implementation of the new software and all operational changes, and was the key contact for all communication with Greenway.
- Scanning/medical information team  
Designed and modified the document scanning process and took charge of labs, hospitals and other medical records. They were also responsible for implementing the orders tracking process and for entering the medical information into the facesheet.
- Check-in/out team  
This team was in charge of obtaining and inputting demographic and medical information into the program as well as initiating and maintaining the patient tracking process. They also tracked the superbill, collected payments and separated the charts to be scanned.
- Clinical nursing team  
Primarily responsible for development and implementation of the clinical and nursing workflows. They were also responsible for orders tracking and following up on all the tasks generated by abnormal results.

- Billing/Collections team  
Implemented the new billing and collections functions of the new program. They systematically moved billing data from the legacy program to the new program as patients returned and continued working on the accounts receivable from the old system.

iv. EHR vendor's roles and responsibilities

Greenway Medical organized logistics for the implementation. They requested that we fill out a 19-page questionnaire covering all aspects of our practice. We were given a to-do checklist to make sure that all was in place prior to hardware installation and on-site training. We had several telephone conferences to track our progress and plan for the transition. The project was divided into several phases and our vendor provided the timelines.

v. Initial and ongoing IT support

Before installation, we obtained the T-1 lines and VPN configurations needed for adequate connectivity between both offices. The hardware was purchased directly from our EHR vendor and was shipped preloaded with the software to our offices. The initial installation and testing was performed by their team and over time was turned over to our local IT vendor. Since then, our local IT resource has managed all hardware and connectivity maintenance.

b. Preparation: Readiness

i. Planning process

Answering the 19-page questionnaire forced us to think of an appropriate implementation plan for our practice. We had to choose between the immediate integration of the EMR into our practice or a more phased in approach. We felt that implementing the billing, collections and scheduling component could be done in short order and in discussions with our vendor, established a go-live day immediately after training.

As previously discussed, we were very reluctant to use the same approach for the EHR component. Our providers need to cover the Labor & Delivery floor as well as the ER. They also have a busy OR schedule and need to see patients in the office that are close to their due date or that have minor emergencies. For those reasons, finding common training time for all the providers was deemed impractical. Our vendor suggested a gradual approach divided in 3 phases described in the implementation part of the application.

ii. Initial plan

Financial information could not be migrated from our old program, so we decided to keep billing the pre-go-live procedures using the old program. When patients who had a balance came in, their account was transferred to the new program and documented as a write-off in the old one. The transition gave us an opportunity to clean up all demographic and insurance data and all patients were asked to fill out new forms.

Patients were also asked to fill out new medical history forms and the information transcribed into the computer by a college student hired for the summer for this specific task. Providers reviewed and corrected any errors. At this point, providers had the choice of making the chart electronic or to keep documenting on the paper chart. If they chose to make it electronic, they would tag it as 'sealed' in the superbill. Otherwise the paper chart would be processed using our established protocols.

iii. Model used for supporting users

Two days were devoted to personalizing the software for our practice. Employee accounts and employee groups were created and user rights were delegated. Importing demographic information from the old system was easily accomplished. Insurance and referring physician information was also easily transferred.

### 3. Training

One week before go-live, we stopped seeing most patients in the office and started the training process. Ten terminals were set up in our conference room and a training schedule was posted to teach our employees and providers basic tasks. Many 'courses' were available depending on the employee position and the tasks they needed to know. Each employee was given a schedule of 'courses' to attend so that they could train, but still be able to help with the few patients that needed to be seen in the office

We received training CD's from the company that proved useful in reviewing certain areas and in training new hires. In addition, we took advantage of Greenway's comprehensive web site, which contains training videos and presentations covering every aspect of the software.

We went live with the new system in April of 2006. For the first three months we only used the billing, collections and scheduling module. We used this time to stabilize our revenues and make sure that our staff felt comfortable with the new software.

### 4. Implementation

#### Phase 1- July 2006

This phase started our implementation of the Medical Health Record. Providers were asked to decrease their schedule to 3-5 patients per half day and the entire office visit was done electronically. The trainers spent additional time with the 'superuser' physician and medical assistants.

We were given stock templates from the company and were taught how to 'stack' them (for patients that came in with multiple complaints) and personalize them. To simplify the process, we kept using paper superbills during this phase. Lab results, hospital records and radiology reports continued to arrive and be evaluated on paper. After seeing a few patients with electronic charting, providers would fall behind and would default to paper documentation.

After the provider was done, the chart and superbill would go to checkout, then to billing. If the chart was still paper based, it was filed as before. If the chart was tagged as 'sealed', it would go to the scanning and archiving area. In order to save time and hard drive space, we elected to only scan the following documents from the paper chart:

- Last written office note
- Last PAP smear
- Last ultrasound
- Last mammogram
- Last BMD
- Surgical pathology
- Operative reports
- Any document tagged as necessary by the physician: usually lab results, pathology reports, operative notes, consultations and procedure notes

The scanning team was trained to study the charts carefully and enter into the facesheet any surgical procedures or deliveries that were performed by the practice as well as the name of the provider that performed them. They then sealed the chart. This protocol proved to be very successful by limiting the amount of scanning necessary and reducing the number of charts called up to be 'unsealed' for review or additional information.

#### Phase 2- August 2006

For two days, trainers worked with providers and Medical Assistants who were having difficulty. From this point on, all new patients were to be entered electronically. During this phase, we started to scan all lab results, hospital records and radiology reports and place them in the patient

file. Results were then forwarded to the ordering provider for signature and possible task creation if abnormal. 'Superusers' were trained on advanced features.

This was the most challenging point of the implementation process. Practice employees and providers were stressed by the rapid changes. In addition, practice revenues dropped due to the decrease in productivity and transient increase in overhead. The initial surge in data entry meant the temporary addition of one employee and an increase in overtime. The providers were at very different levels in the implementation process and only about 50% of the charts were being 'sealed'. Most of the providers worked overtime to complete the charting.

### Phase 3- September 2006

For the last 2 days of training, trainers again worked with providers and Medical Assistants. Interface with Quest and LabCorp was successful and significantly reduced the workload of the scanning team. Providers were encouraged to abandon paper superbills. Frequent meetings amongst providers and our Administrator continued for several months to discuss templates, the overall progress of the EMR project, our financial status, personnel issues and short and long-term goals.

By November, revenues returned to normal levels, and proficiency with the program was growing. Templates were refined so that users became more efficient and coding levels were more accurate. Providers were converting more and more charts to electronic form and workflows were running efficiently in all areas. Still, about 30% of patient visits were paper-based. This 'double system' was inefficient and confusing. We decided on a deadline of January 1<sup>st</sup> for 100% implementation of the new workflows. Selecting a deadline created a sense of urgency and encouraged some last minute training and mental preparation, but this final transition occurred without difficulty.

Throughout all of these phases, phone support was invaluable. Our EMR vendor's phone support was excellent at answering most of our questions. Almost every morning, some of the 'superusers' would get together before office hours for a 15-minute mini-meeting and conference call Greenway with two or three critical questions. Most of the time we obtained the answers we needed. Our team had to brainstorm solutions and work around certain issues unique to our practice.

One unexpected realization was that our existing clinical questionnaires were very deficient. The software gave us the ability to document a patients' medical history in great detail, and we had to redesign our questionnaire to capture and transcribe medical information with more detail. This change led to a significant improvement in the quality of care that we are providing.

After 18 months, our practice is using most of the functionality offered by the Greenway program. All patient visits are documented electronically, and all labs and clinical reports are part of the electronic record, reviewed by a provider and properly signed off or delegated to a Medical Assistant's task list. Internal communications and messaging is handled via the internal e-mail feature, and included in the patient's medical record if appropriate. Paper superbills were eliminated and electronic versions received by the checkout desk and the billing department. Providers are trained to at least finish the 'plan' part of the note so that check out can be accomplished without delay, and the final progress note is amended as time permits at the end of the day. Even hospital procedures such as surgeries, deliveries and consultations are now billed using the system. The only remaining paper 'superbills' are from patients that have never been physically seen in our office, such as emergency room patients or hospital consults.

Our software vendor reports that our practice ranks amongst the top 2% of practices in terms of successful implementation, and uses us a local reference and demonstration site. We have acted as consultants to assist several practices that want additional set-up and training or that have stalled in their implementation process. Morale for both staff and providers is at an all-time high. Revenues are at record levels, overhead is decreasing and overtime is minimal.

### Lessons learned

- Use a reliable, local IT company or administrator to install and maintain your system

- Develop simple and complete patient demographic and medical information forms that match the software for easy entry
- Make sure your leadership team is ready and able to undertake a complex and stressful long term project
- Prepare financially and establish reserve funds to account for a temporary drop in productivity and increase in payroll and overtime pay
- Schedule short, daily meetings to work through small but important implementation details
- Create deadlines for complete implementation of key components of the program
- Focus on two or three issues to tackle every week. Do not try to fix every problem simultaneously
- Be patient, ask for assistance when needed and don't give up!

## 5. IT Support

- a. Most of the interface infrastructure was already set up for our legacy software and our local IT specialist performed the testing.
- b. Hardware was purchased directly from Greenway and drop shipped to our office. The software came preloaded and installation was performed by one of their technicians.
- c. The program offers great flexibility in customizing each user's start up screen as well as the clinical content areas. During training, each user configured their preferences to their liking.

Stock clinical templates provided by the company were customized by the physician 'superuser' to fit most of the clinical situations encountered by our practitioners. Many templates were created from scratch to describe even infrequent clinical conditions. Weekly meetings and e-mails offered suggestions that refined these templates to the point that they became easy to use and to 'stack' when patients came in with multiple complaints. Orders for labs, radiological testing and consultations are easily created within these templates. Almost all the item choices in the template are now pre-filled to expedite the visit, and the tablets make it very easy to change these choices at the bedside from the drop-down menus.

- d. Our existing IT partner was a single individual that proved inadequate to handle the complexity of the new system. We found a local established company in our area through a recommendation from a group of colleagues. They provide us with excellent upgrades, maintenance and support.

## 6. Disaster recovery

Our initial recovery system was based on tape backup as recommended by our software vendor. Each day we back up using one of 30 different tapes. We subsequently learned that tape backup is unreliable and slow if data recovery is necessary. As a result, we recently added a Network Storage Device that provides full system backup, full recovery of lost data and prompt restoration of service. We now use these two redundant systems.

Testing on the Network Storage Device is performed remotely by our IT vendor on a weekly basis. In addition, 3 tapes are randomly tested on a monthly basis to assure integrity of our backup recovery process. Lastly, we are currently considering daily offsite download of data and are reviewing several possible vendors. We also developed protocols for multiple data backups and offsite storage in case of hurricanes or other emergencies that may arise.

## III. Technology Purchasing

### 1. EHR System

The Managing partner and the office administrator assumed responsibility for EMR evaluation and implementation. The managing partner has a BS in Computer Science and was responsible for evaluating the patient charting and clinical side of the software. The office administrator had

successfully implemented an EMR in her previous position and was responsible for the evaluation of the scheduling, billing and collections components. Resources included:

- Journal articles
- Initial evaluation of 8 different systems at the annual ACOG conference
- Site visits to 4 practices with different EMR's
- Company Internet sites
- Interviewing references
- On-site demos by 3 vendors

Since we needed to replace our existing software and hardware, we decided from the beginning to only look for integrated systems that included the Patient Health Record along with scheduling and billing functions.

## 2. Description of Technology

Our practice chose Greenway Medical Technologies as the best partner to meet our needs. Their product is seamlessly integrated to provide scheduling, charting, billing, collections and reporting for our practice. One of its most compelling features is a truly intuitive and attractive Graphical User Interface. This makes the functionality of the program more accessible and easier to learn. Functionality features include:

- Secure data access with personal passwords that must be changed regularly
- Patient tracking to locate patients within the practice
- Data entry of patients medical history
- Automatic calculation of level of care provided during the visit
- Electronic superbill available in real time to check-out area and to billing
- Robust Obstetrical tools to track visits, lab work, ultrasounds, patient teaching, consultations and problem lists

Interfaces with other systems are cleanly implemented. Examples include:

- Bridging to Quest and LabCorp so lab and pathology reports are easily placed in patient charts
- Zetafax functionality to convert faxes directly into PDF files that can be easily placed on patient charts. In addition, EMR documents can be e-faxed directly to other providers offices, hospitals or insurance companies
- Motion Computing tablets connected wirelessly so providers can document from the bedside using a variety of data entry techniques, including templates and handwriting recognition
- Docking stations for the tablets placed in the doctors offices and at the nurses stations for occasional typing
- Scanning stations for existing medical records, ultrasound and BMD reports, consent forms, records from other practices and other paper documents arriving to the office by mail
- Small scanners at check-in for drivers license and insurance cards

## IV. Functionality

Greenway Medical is a CCHIT Certified Ambulatory EHR product that has met a comprehensive set of criteria for functionality, interoperability and security. Choosing a certified product was extremely important to us since it meant that the software provides a comprehensive list of features reviewed and certified by an impartial professional organization.

At this point in our evolution, almost every component of our EMR is in use. However, most providers are not using the template modification and customization tools. They are not interested in developing those skill sets and are happy to let just one physician create, modify and improve the templates. However, they are all able to customize their note manually and complete the

charting and superbill summaries at the time of the patient visit or soon thereafter.

One of our biggest concerns as providers was the fear of losing or misplacing pathology or lab results obtained on a patient. Our previous process involved tracking pathology samples on a logbook. This task became inaccurate as the number of providers, offices and Medical Assistants grew. We now have the ability to check on all PAP smears, pathology and lab results each month to verify that all have returned for evaluation. We can easily run a report indicating the few missed items and cross check with the lab to find them or repeat the test.

One of the features still undergoing refinement is the clinical alert feature that creates flags for patients that may need specific tests or treatments. One example is the creation of an alert for patients under 26 years of age that are candidates for Gardasil HPV vaccination. The program can filter out pregnant patients and patients that already received the vaccine. These flags can serve as great reminders for our practitioners and we are finding many situations to use them. Other clinical alerts in use include identifying candidates for Hepatitis vaccination, Forteo treatment for severe osteoporosis, and mammogram scheduling.

## V. Value

### 1. Success in Meeting Objectives

#### a. Business and clinical objectives

- Eliminate the need to look for paper charts  
Electronic charts are simultaneously available to any person and department within the practice
- Eliminate errors in reviewing labs and radiology reports  
Interfaces with labs and zetafiles from hospitals, radiology centers and doctors offices place results quickly in patients' charts and have reduced delays and errors to a minimum. These documents are tracked and if not found, reports will alert us of the need for a search or reorder of the test.
- Reduce delays in obtaining and acting on patient results  
Turnaround time for results has decreased considerably. Data is reviewed by the providers with minimal delay, and abnormal values are delegated to the proper Medical Assistant via a task. The Medical assistant properly documents any action resulting from a task.
- Eliminate illegible handwriting from charts  
The use of templates has eliminated this problem. All notes are typewritten.
- Eliminate incomplete documentation for billing  
The program calculates the proper level of billing for each visit based on the number of bullets. Practitioners can easily override the level assigned if time or other factors are more appropriate.
- Make clinical information accessible to providers on nights and weekends.  
This problem was solved by the use of VPN lines and secure remote access to our computers via gotomypc.com.
- Improve internal communication  
The internal e-mail feature is valuable for both efficient communications of operational issues as well as patient care.
- Improve documentation of phone conversations with patients  
E-mail notes can be placed easily in the patient's chart when appropriate. Phoned in prescriptions can also be added to the chart via the facesheet.
- Reduce office noise and foot traffic level  
The complete elimination of charts and written notes made our nurses station, checkout area and doctor's offices look clean and professional. Employee movement is greatly reduced since they are not continually looking for charts. Communications that once occurred by telephone or conversation is efficiently handled and documented with internal e-mail. We have fewer interruptions and distractions.

- Upgrade software  
We have transitioned to a state of the art practice management software that suits the needs of a growing practice with multiple providers and locations. Our software is regularly updated and functionality added regularly. Technical support is excellent and we feel that we joined a team led by a financially strong and competitive company that will help us to become more successful.
- Decrease in human resources devoted to medical records  
Our medical records staffing needs decreased by two positions. In addition, there was a marked reduction in levels of overtime necessary in other areas of the practice.
- Decrease in expenses for office supplies  
We noticed a significant reduction in chart and paper supplies as well as the use of printers and ink cartridges.
- Allow providers to work from home instead of staying late at the office  
Providers and some employees have VPN lines that connect their home computers securely to our server. We now have the flexibility to go home and spend time with our families, and complete the work at our convenience.
- Increase physician productivity by allowing connectivity at hospitals while waiting for a delivery or for surgery  
By subscribing to gotomypc.com, we are able to log on remotely to one of our office computers. Time at the hospital waiting for the Operating Room or for a delivery can now be used for answering e-mails or signing off on labs.
- Make our office more environmentally friendly by decreasing paper waste  
We have already recycled more than 220 boxes of old medical and financial records. Our office generates significantly less paper waste compared to 2 years ago. Recycling bins are available throughout the office.

b. Qualitative and quantitative evidence

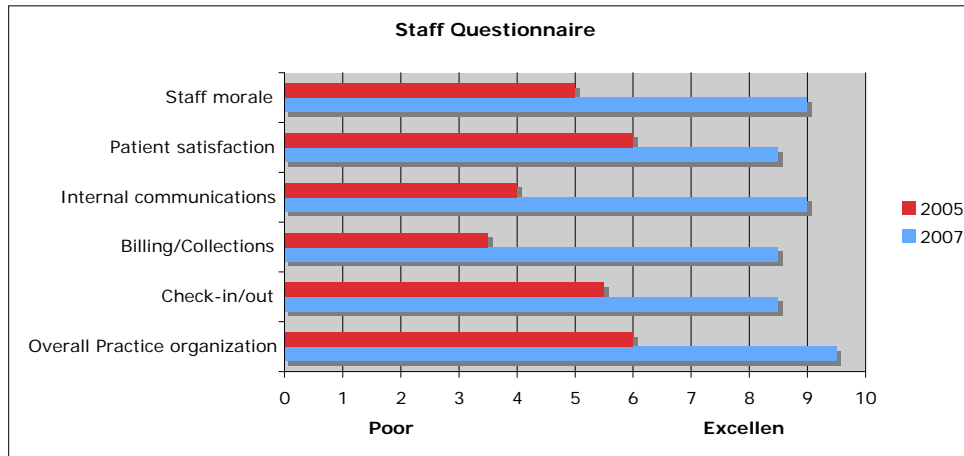
i. Clinical objectives

Improvements in patient care are difficult to objectively measure but are evident in the improved accuracy and organization of patients' medical histories. Areas of concern such as tracking lab and pathology results were resolved. Clinical alerts are being implemented to remind providers of needed vaccinations, testing that is due or treatments that the patient may qualify for.

ii. Other objectives

a. Provider satisfaction

We asked our providers and staff to fill out a questionnaire comparing their experience between the old paper based workflow (2005) and the new EMR based one (2007). We asked them to carefully evaluate the practice before the EMR was in place and to ignore the year of transition (2006). The results are as follows:



We were not surprised to see that our internal communications and overall practice organization were much improved with EMR. However, certain areas we thought were in good shape such as Check-in/out and patient satisfaction were also viewed as deficient and have made significant gains. Especially surprising was the improvement to the billing/collections area, which we previously perceived as a strength.

#### b. Patient satisfaction

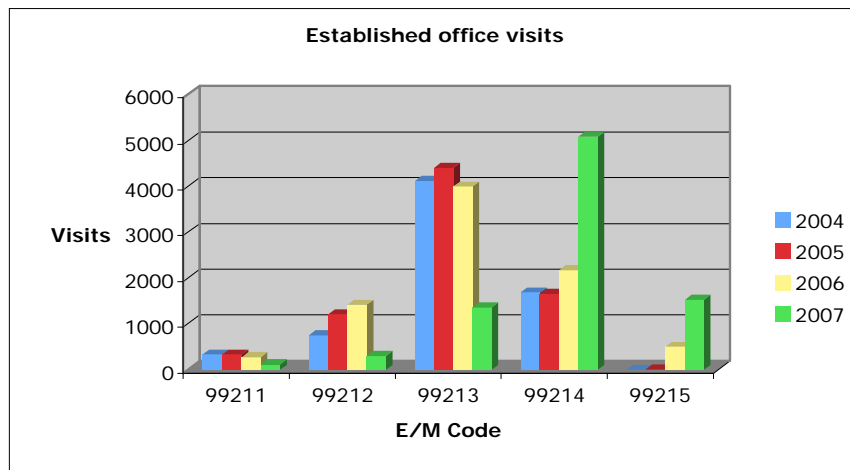
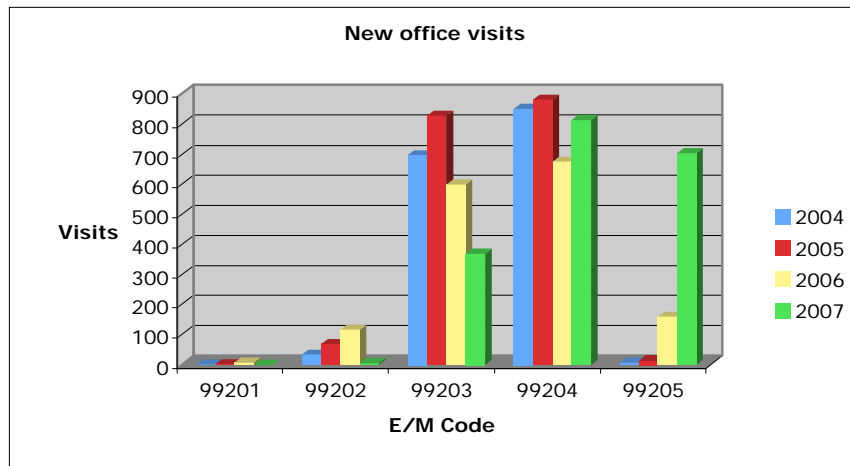
We do not have an objective baseline measurement from 2006 to compare our current level of patient satisfaction. However, patient-waiting time is now shorter, and the entire office visit is more streamlined. Patients often comment on our use of the tablets and the overall cleaner and more organized feel of our practice. We often review their lab results, radiology tests and even surgery photos from the tablet screens. We can quickly either print or fax the results to the patient or their PCP's. Our Web based Patient Portal will allow us to securely communicate with our patients and securely provide them access to their lab and pathology results online.

#### c. Descriptions of transformed processes

Almost every workflow was transformed by the implementation of the EMR. Every clinical phone call is documented as a message in the patient's chart and any decisions made and recommendations given are written into the chart. Each Medical Assistant has a task list that organizes their duties and reduces the chance of forgetting something important. Patient charts are better organized since documents can be placed in customized folders, making them easier to find and track over time.

#### d. Measures of quality

One easily quantifiable measure of improved efficiency is the coding accuracy that resulted from the transition to EMR. As seen on the graphs below, the level of care calculated by the software resulted in a marked increase in E/M coding level, which ultimately led to an increase in reimbursement for the practice. Clearly, our providers and billing staff were consistently undercoding in 2004 and 2005.



Other measures of quality are more difficult to quantify for our kind of practice, since we do not have an objective way to capture measures such as decrease in errors, quality improvement, efficiency, patient satisfaction and productivity. However, we have much anecdotal evidence to suggest that all of these areas posted significant improvements.

2. Ongoing areas of improvement

There is still a lot of variability in the level of proficiency with the EMR from the providers. In spite of monthly meetings where areas of concern are discussed, several providers have reached a plateau and seem content with their level of expertise. The same problem is found in the Medical Assistants. To be fair, the level of complexity and amount of detail is high and it takes some time to master all the intricacies of our processes, especially for new hires.

3. External networking

We are currently bridged with Quest and LabCorp, our main lab and pathology vendors. All of their results are sent directly into our EMR as data and placed in the patient chart. Documents from the hospitals (OP reports, pathology, dictations, referrals, radiology and labs), specialists and radiology centers are ZetaFaxed and converted into PDF files that can be directed into the patient charts by one of our staff.

4. Costs and Benefits Offsetting Costs

a. Purchase funding

All costs were the responsibility of our practice and were funded by obtaining a lease payable over three years. Some costs such as travel, meals and lodging for the training team was paid from practice revenues. Additional equipment, lost productivity and increased overtime also led to a temporary increase in practice overhead expenses.

b. Financial benefits

Costs of transition

Hardware:

\$70,932

Dell main server, Dell terminal server tape backup, 28 desktop PC's with flat screen monitors, 4 MotionComputing Tablets, 2 Laptop PC's, 2 large scanners, 2 small scanners, 4 wireless LAN kits, 4 HP printers and 2 digital cameras. Additional 3<sup>rd</sup> party software including Microsoft Word, ZetaFax and Norton Antivirus.

\$7,500

Installation of equipment, T-1 lines, ZetaFax, Quest & LabCorp interface, VPN lines.

EHR:

\$82,000

Greenway software license fees

\$2,250

Data conversion fee

\$2,250

Logistics

\$15,000

Training service

\$5,000

Meals and lodging

\$5,000

Additional personnel (temporary employee for 3 months to assist data entry and scanning)

\$30,000

Temporary overtime

Recurring costs:

\$2,000

Monthly Greenway maintenance costs

\$1,500

Monthly IT vendor costs

Total investment (2006-2007) \$ 277,532

Tangible Benefits

- Increased total billings and revenue

<u>Year</u>	<u>Total Billed</u>	<u>Revenue</u>
2005	\$ 6,010,388.50	\$ 3,131,537.17
2006	\$ 6,470,234.83	\$ 3,145,521.32
2007	\$ 8,122,809.22	\$ 3,706,995.11

Total increase in revenue: \$ 561,473.80 (15.1% increase)

- Decreased overhead expenses

	<u>Total savings</u>
Payroll	
2 ½ positions eliminated	\$80,000
Reduction of overtime	\$15,000
Supplies	
Chart supplies	\$15,000
Paper, printing	\$ 6,000
Postage	\$10,000
Total overhead savings	\$126,000

Net benefits

Total increase in revenue \$ 561,473.80

Total overhead savings \$ 126,000.00

Minus Total investment \$ 277,532.00

Total benefit 2006-2007

\$ 409,941.80

The greatest expenses incurred by converting to EMR are the initial one-time costs of the hardware, software and training. The many benefits will accrue over time and make the entire project a great long-term investment for the practice.

c. Meeting business objectives

As a small practice, we did not have formal business plan for the EMR when we started.

However, even from a purely financial angle, it is clear from the previous analysis that it was a very worthwhile endeavor.

## VI. Lessons Learned/Critical Success Factors

### 1. Keys to success

- Leadership  
Leadership is the most important asset. The ability to recognize talent and place it in its appropriate department is critical. Some employees were initially assigned unsuitable tasks and were frustrated and inefficient. Once reassigned, their valuable qualities contributed greatly to our success. Change is difficult for everyone, and discipline and encouragement from the leadership team was essential for success.
- Computer knowledge  
The senior partners' experience with hardware and software issues was important in the initial evaluation of software and in the implementation process. Communication with IT services was expedited and problems communicated clearly and quickly. A strong local IT vendor is essential and should be involved early in the planning process.
- Teamwork  
Daily meetings were useful to resolve small problems and communicate clearly with different team members. Larger, weekly meetings helped to keep everyone informed of the progress.
- Problem solving skills  
Managing significant change in a busy practice while still maintaining productivity and delivering quality care required multitasking and creativity to solve a multitude of small problems. The software vendor can help to some degree, but in the end, we had to be creative and come up with many unique solutions that best fit our type of practice.
- Perseverance  
It is easy for a project of this nature to stall as providers and staff get frustrated or reach an acceptable level of proficiency, but fail to use all of the program's functionality. The leadership team continually pressed and encouraged implementation, working on two or three issues at the time, and creating deadlines for key events.

### 2. Things we wished we had known before we started

- Select a strong local IT vendor  
Hardware, wireless and connectivity problems are very frustrating when trying to take care of patients. A competent and responsive vendor can keep your computers running with minimal interruption, and make sure your network is secure and backed up at all times
- Hire a consultant  
A specialty-specific consultant can provide software-specific forms, logistics, template creation and set-up of the program to improve efficiency and decrease the learning curve. They can also offer real world advice and encouragement that a software vendor cannot. For a busy office with limited time and a need to maintain productivity, consultancy services could have saved a significant amount of time and ultimately reduce stress.
- Training on tablet use

Wireless tablets are the most practical devices for entering patient information. But most providers are initially uncomfortable with their use. Setting aside some time for formal training could have helped to reduce frustration.

- Be ready to devote a lot of time  
We underestimated the amount of time and resources that we would need for implementation. This was especially true for the practice leadership and the 'superusers'. Scheduling short morning meetings were a great solution and should have been scheduled from the very beginning of the project.

### 3. Sharing thoughts

Looking back on our experience, implementing an EMR was the most challenging project of our professional career. It put our leadership abilities to the test, and pushed our creativity, multitasking ability and stamina to the limit. At the end of the day, it was all worth it. We now have a modern organization, motivated and with the tools to provide the best medical care to our patients. Medicine is about information and detail, two things that computers do particularly well. But the medical business is complex and no matter how much they try, information systems cannot simplify it. An EMR system is like a desk with a thousand drawers: in order to master it, we have to memorize what is in each one of those drawers. Once that is done, the technology becomes less visible to the user, and they can get back to taking care of patients. One thing that we all agree on is that we could never go back to paper!

We hope that our experience can be helpful to others as they transition to EMR. It is very rewarding to have colleagues and other practices visit and call us to study and emulate our workflows. Most practices in the United States will implement these systems in the coming years, and we want to contribute to their success. We truly believe that it will help physicians improve efficiency, provide better care and deliver it in a more cost effective manner.

## VII. Future Plans

### 1. Plans for Expansion

- Integrate a patient portal web site with capabilities for data entry and update of demographic and medical information, as well as requests for appointments. This project is currently in development.
- E-mail reminders for appointments
- Secure, web based patient access to lab results, radiology and pathology reports
- Electronic patient billing
- Connectivity for automated entry of vital signs (blood pressure, pulse, weight)
- True E-prescribing

### 2. Plans to keep current

Managing and improving systems at a busy practice is a constant process. Daily problems and urgent matters consume a lot of management's time and effort, leaving few resources for more strategic endeavors. Luckily we have some great resources available.

Greenway Medical has an annual user group meeting where over 300 practices from around the country meet to train on the software and discuss how to improve acceptance and implementation of our EMR. It is a chance to network with many talented and motivated individuals that share the same problems and frustrations of our profession. The formal courses as well as the informal networking and discussions are a great way to improve our staff's skills, and find solutions to seemingly intractable problems. Every year we send several staff members and they return with new ideas and renewed enthusiasm. We find that this kind of networking is invaluable in the training of our staff, improving our processes and getting the most out of our EMR.

We also anticipate that our hospital partners will continue their plans for convergence and eventually integrate fully with our EHR vendor. We look forward to the day when we can get records electronically transferred to and from other physician's offices or any medical facility, with the ability to populate our facesheet information automatically. This kind of electronic information transfer will dramatically reduce the redundancy of data entry, improve efficiency and reduce errors.