## Section A. Identifiers

1. Name and Title of Submitter: James L. Holly, MD, CEO

2. Practice Name: Southeast Texas Medical Associates, LLP

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7. Physicians in the practice: 24

8. Number of FTEs (by staff category)

| | | | |
|---|---|---|---|
| Physicians in the practice: | 24 | FTEs: | 23.0 |
| Nurse Practitioners in the Practice: | 12 | FTEs: | 12.0 |
| Physician Assistants in the Practice: | 0 | FTEs: | 0 |
| Additional Staff: | 260 | FTEs: | 240.0 |

9. Provide detailed information regarding any commercial/employment agreements with the vendor/s of EHR hardware and software. If no such arrangements/agreements exist, please indicate "No commercial/ employment relationships with any vendor of our EHR system."

   No signed commercial/employment relationships with any vendor of our EHR system, but we serve as a site visit for NextGen Healthcare.

10. Annual Number of Patient Encounters: 263,000 including clinic, hospital, nursing home, physical therapy, hospice, home health (all of which are done electronically).

11. Please list the names of the members of the EHR Implementation Team (who will all be considered authors of the application):

    James L. Holly, MD, CEO, Managing Partner
    Richmond Everett Holly, CIO
    Mark Wilson, MD, Partner, SETMA Medical Director
    Qamar Arfeen, MD, Partner, SETMA In-patient Medical Director
    Syed Imtiaz Anwar, MD, Partner, SETMA Clinical Director, Laboratory Services
    Brad Thibodaux, Network Administrator
    Jonathan Owens, Template Development Specialist

## Section B. Guidelines for Application

### The Organization

*Provide a general description of the organization—the sites, size and organization of the practice and the patient population it serves.*

SETMA began in 1995 as a single-location, primary-care practice with five providers utilizing transcription for documenting medical records. In 1997, SETMA had grown to a 10-provider practice and realized that future growth and development was limited by the paper-based medical record. In March, 1998 SETMA purchased NextGen® EMR (Electronic Medical Records) and NextGen® EPM (Enterprise Practice Management). In August 1998, SETMA transitioned from a legacy practice management system to NextGen® EPM, and SETMA saw its first patient "live" on the NextGen® EMR system on January 22, 1999.

Today, SETMA has three clinical locations and 36 clinical personnel, including 23.0 full-time-equivalent physicians. In addition, SETMA has separate locations for each of the following: billing office, physical therapy department, hospice, home health and mobile X-ray. SETMA operates a level two, moderately complex reference laboratory, which is completely integrated electronically.

SETMA's 24 physicians are dominated by Primary Care, Family Practice, Internal Medicine, Pediatrics and Nurse Practitioners, supported by Rheumatology, General Surgery, Pulmonology, Ophthalmology, Radiology and Sports Medicine. In the past year, SETMA has added a Colo-rectal Surgeon, ENT Surgeon, Nephrologist, Podiatrist, Neurologist, and Endocrinologist. SETMA employs 260 personnel and has a patient base of more than 80,000 patients. In addition, through electronic means, SETMA provides management services to the critical care areas of two local hospitals, Golden Triangle Physicians Alliance (a physician-owned IPA), and Select Care of Texas (a federally approved PSO). SETMA's IT solution is integrated across the entire network, providing HIPAA-compliant access to patient data at all points of service including all emergency rooms, three hospitals, all clinical locations, all providers' residences, and nursing homes.

### Management

*a)* *Business Objectives—Describe why the practice decided to implement an EHR and what you hoped to accomplish by doing so. Include specific expectations framed in a business case. (Note that this will provide the framework for discussing what you have accomplished).*

SETMA's partners realized that the pursuit of excellence in clinical care required electronic medical records. SETMA's primary objective in implementing an EHR was to move from paper to electronic patient management. The expectations in deciding to implement an EHR and the principles which guided the choice of NextGen® included:

- The realization that the complexities of 21st-Century medicine required "data management" rather than "document management." This could only be done via EHR. After purchasing NextGen®, SETMA quickly transitioned from the pursuit of electronic patient records to the pursuit of electronic patient management.
- The ability to measure provider performance and outcomes of medical-decision-making processes required "data manipulation" which is only possible with EHR. Additionally, the establishment of national standards of care or best practices, which confront a provider every time he/she sees the patient, regardless of care setting, could also only be accomplished with an EHR.
- The establishment of a true "continuum of care" health-care-delivery model, with continuity of care between the outpatient care setting, in-patient care setting, long-term residential care setting, and the home setting, among other points-of-care access to patient data, required records which are not "locked up" in the clinic, but which are accessible wherever the provider and/or patient might be at the time care is given, counsel is offered, or questions arise. EHR and electronic patient management enabled SETMA to begin utilizing the EHR in the hospital in 2001.
- The integration of patient-encounter documentation, laboratory, radiology, special procedures, consultations, hospital history and physicals, hospital discharge summaries and specialty care data required electronic patient records.
- The expense of manipulating and maintaining excellent paper records, of transcribing those records and of having them available in a timely fashion made the potential return on investment of an EHR attractive.

- The shrinking margins in reimbursement of medical care necessitated the optimizing of revenue recovery for services performed which could only be done by having providers "post charges" at the point of service with association of ICD-9 and CPT codes by the provider. This could only be done by EHR and EPM integration.
- The ability to instantaneously infuse national standards of care in complex treatment conditions and settings required EHR and electronic communication via integration of electronic medical records with electronic-mail functions. This enabled SETMA to design and implement electronic tickler files, electronic referrals and computer-generated voice mail appointment reminders, and, at the same time, address and comply with all HIPAA requirements for confidentiality.
- Increase income due to various administrative and clinical efficiencies.
- Enforce patient safety through the following initiatives:
  ~ Electronic drug/drug, allergy and condition interactions checking
  ~ Correct medication checking
  ~ Patient Education

b) *Project Organization—Describe roles and responsibilities for managing the EHR effort, including accountability for success and the resources assigned.*

After SETMA's partners examined numerous EHR products at a national trade show in October 1997, the responsibility for further investigation and recommendation was assigned to SETMA's Chief Information Officer. An Informatics Committee was organized to design an implementation strategy and decide what the goals and objectives were for going forward with an EHR and EPM. Once a vendor was selected, a Template Committee was established to guide the building of the templates in that the EHR we selected allowed for full customization of the electronic record.

The collaboration between the technical support team and the healthcare providers was close in order to be sure the system would work, and that it would be helpful in the clinical setting. That collaboration, driven by mutual respect and trust, remains the hallmark of our success in implementing the EHR initially and in keeping the development process moving forward for the past six and a half years.

Decisions were made early that our implementation of the EHR and construction of templates would be by consensus rather than being individualized. This allows for: standardization of care, standardization of documentation, comparison of care and comparison of documentation. This is probably the most important decision we made and is one that directly impacted our success.

Once the templates were sufficiently developed, an Implementation Team was assembled and a plan of attack was designed. It was decided that the CEO would be the principal person responsible for the success of the project, although all SETMA partners, Executive Management and staff embraced the project and worked toward its success. As a result of the resolution of all of the principals of SETMA, we began the utilization of the NextGen® EMR on January 22, 1999 and on Friday, January 25, 1999 saw all patients in the holly pod on the EHR and have done so since. Subsequently, we had the same successful experience with each pod.

The IT Department, which recently hired another support person, bringing their number to 4 full-time personnel and one part-time person, is responsible for the stability and availability of the EHR for clinical purposes. The IT Department keeps SETMA's system up and running, as we utilize the system 24-hours-a-day, seven-days-a-week. The IT department has designed a network solution to maximize security, stability, speed and scalability. This has ensured that SETMA's EHR is always available, is supportive of all clinical processes, is minimally intrusive to the patient-physician relationship, and that the EHR improves clinical decision-making workflow, efficiency and excellence.

## Implementation

c) *EHR System: Identify the product your organization selected and the functionality it provides (data access, data entry, decision support, workflow and communications, etc) Briefly describe the technology, including interfaces with other systems and the user interfaces employed, and the role your practice plays in managing the technology.*

## Selection and Functionality

To achieve its stated goals, SETMA selected the following products:

1. NextGen® EMR (Electronic Medical Records), which provides:
    - Electronic Health Records
    - Clinical Decision Support
    - Document Generation
    - Disease Management
    - Health Maintenance
    - Workflow and Image Management
    - E & M Coding Optimization
    - Referral Management
    - Outcomes Analysis
    - XML Data Sharing
    - Lab Order Entry and Result Reporting
    - Patient Education

2. NextGen® EPM (Enterprise Practice Management), which provides:
    - Patient Registration
    - Master Patient Index
    - Appointment Scheduling
    - HIPAA-compliant X12 837 (claims), 997 (acknowledgments) and 835 (remittance) transactions
    - Online insurance eligibility verification, referrals and claim status
    - Worklog Manager—enables providers to electronically assign routine tasks to staff members for completion
    - Enterprise Report Writer
    - Full Integration with Electronic Health Record
    - Workflow and Billing Management

Through template-driven algorithms, the healthcare provider, utilizing point-and-click, voice-activated data capture, typing and/or scanning can capture: should these be bullets like the rest of the lists?

- history and physical
- visit notes
- problem list
- medications
- radiology reports
- reports and correspondence from outside the practice
- lab results

SETMA's EHR implementation provides the documentation of:

- More than 260,000 patient encounters per year.
- More than 672,000 incoming telephone calls per year.
- The responses to those telephone calls.
- More than 15,000 X-rays and more than 4,000 EKGs a year.
- All Nursing Home patient visits, including hydration assessments, nutrition assessments, fall-risk assessments, skin assessments, etc.
- All laboratory ordering and reporting for in-house reference laboratory. Interfaces with national laboratories are being put in place at present.
- All physical therapy visits in SETMA's physical therapy clinic.
- All hospital admission history and physical examinations, discharge summaries with diagnoses, medications, consultations, procedures and hospital course, which represents more than 40,000 daily hospital visits per year.
- All medications used to treat a patient, including checking for drug/drug interactions and patient/drug allergies.
- Return to work authorizations.

- Waivers of payment of Medicare and Medicaid charges.
- All referrals to specialists managed electronically at the point of service, whether clinic, hospital, etc.
- Follow-up instructions for additional or future testing. SETMA has designed a unique electronic tickler file, which enables us to make sure patients who require follow-up testing get it.
- SETMA has a future labs capability whereby the provider can schedule labs for future drawing, which is electronically transmitted to the lab. When the patient arrives at the lab on the scheduled date, the information is already there with the ICD-9 and CPT codes associated, making it convenient for the patient, productive for the practice, and easy for the provider. Also, if a patient does not return for the laboratory test, that information is conveyed to the provider.
- Because paper is expensive and inefficient to manage, it has been our goal to eliminate paper from the office. While we do not burn paper, SETMA is 99% paperless due to its "Fahrenheit 451 Project". Fahrenheit 451 is the kindling point of paper. It has been the mission name of SETMA's efforts to become paperless.
- All charge posting is done by the healthcare provider at the point of service.

SETMA's implementation also has resulted in the ability to:

- FAX all prescriptions to pharmacies.
- E-mail laboratory results to our patients when proper security is in place on both ends of the transaction.
- Communicate with our patients via e-mail when we have authorization from the patient and/or when security is in place on both ends of the transaction.
- Receive request for appointments, referrals, billing information or laboratory data via our website.
- Utilize an electronic super bill for association of ICD-9 codes and CPT codes.
- Create a billing event automatically from the patient's examination room.
- Provide patients with educational information automatically at the point of encounter, which is personalized, for each patient and for the practice.
- Develop extensive Microsoft Access reports on:
    - Immunizations
    - Disease state management
    - Preventive health issues, male and female
    - Practice patterns
    - Provider patterns
    - Payer patterns
    - Aging of accounts
- Compare provider performance as to quality of records and appropriateness of assessment.
- Incorporate multiple health assessment/prevention questionnaires into the routine office visit.
- Allow the provider to look at "information over time," following trends for vital signs, laboratory work and procedures.
- "TeleHealth", which allows SETMA to place an automated call to our patients with chronic diseases to initiate interim follow-up for them and/or to make sure they are following our instructions for care.

### Technology

All our databases run on Microsoft SQL Server 2000 sp3. We also utilize Microsoft Office XP for our management and providers to write letters, spreadsheets, Access reports, etc. Microsoft Outlook integrates with the NextGen® software and enables users to access their email from both applications.

We utilize Citrix XP for our remote locations, which enables remote users to access the system and to optimize the bandwidth we have between our locations. This also drastically reduces the number of IT staff we need to maintain the system, as it allows us to "fix" most issues remotely without having to staff each location. Furthermore, it simplifies updates to our operating system software and our other software packages, as we only have to update seven servers as opposed to 300 workstations.

We also use IBM's Tivoli Software to do daily backups of all of our patient databases and important information. This allows us to have backups of our data on the server drives, in a centralized location on our disk subsystem, a set of tapes that stays in the tape library, and another set of tapes that go off-site.

Current hardware:

- 22 IBM Xseries360 servers in an active/passive cluster. These are connected by 4 fiber cards to an IBM FasT700 Controller, which is connected to an EXP500 array of 10 72GB hard drives in a Raid 5 configuration.
- Our backups are performed with IBM Tivoli and are backed up to an IBM Dual Drive DLT Tape Library.
- Our servers are powered through APC Battery backup devices that condition the electricity as well as offer backup power in case of a power outage.
- Our server room is on its own electrical circuit that comes directly off of the building's main power supply. There are multiple devices included in our electrical circuitry that condition the electricity, as well as provide protection from any power spikes or lightning damage.
- We have a stand-alone, five-ton A/C unit in our server room, to keep the equipment at an optimum temperature.
- Our remote locations are connected using Cisco equipment and via multiple T1s to provide redundancy. Each location is connected to our central office through two independent T1 "legs". Both of these legs would need to be cut in order for a location to be down.
- We have a unique "bare metal restore" feature, which is completed through the IBM Tivoli product. With this feature, we take regular images on three of our mission-critical servers. If one were to crash, we could boot to the server from the floppy disk and restore the ENTIRE server across the network in under 30 minutes. This would restore the operating system, drivers, software and data. Normally a re-install like this would take a full day or more.

### Interfaces

We are currently running a live interface between NextGen® EMR and LIS software. This allows us to perform tests ordering from the EHR, and the results come back into the patient's chart automatically. We also have instituted an interface between our LIS and Quest Diagnostics. This interface would allow tests ordered through the EHR to go into our LIS and then based on logic tables defined in the LIS to be performed in house or to be sent to Quest for processing. Once completed, the results would be downloaded from Quest to Orchard and would then automatically flow back into NextGen® EMR's workflow module.

The system also interfaces with our billing functions. ICD-9 codes, which are electronically connected to the diagnostic descriptions detailed in the assessment, are associated with CPT codes for the tests and procedures that are ordered. This is done without any additional work by the provider other than indicating what testing is to be done and for what reason. When that is completed, with one click of one button, the provider does the following:

- Sends the testing order to the laboratory, x-ray, special procedures department, or nursing for administration of immunizations or injections.
- Posts the charges to the patient's account with the ICD-9 and CPT codes associated.
- Creates a super bill, which is retained in the EHR for auditing, if required.

The system alerts the provider if a particular CPT code is not justified on the basis of a particular ICD-9 code. The system, however, does not suggest an alternative ICD-9 code, as that would be a violation of Federal regulations. The provider then can determine if there is a legitimate diagnosis for the payment of the CPT code, or if a waiver is to be signed so that the patient is aware that he or she may be responsible for the payment of that part of his or her care.

*d) System Implementation—Describe your approach to rolling out the EHR system, including how you phased the rollout and accomplished process redesign and staff training and support.*

After extensive development of our unique database over a period, which extended from April 1998 to December 1998, SETMA went "live" with the EHR on Tuesday, January 22, 1999. We decided to "go live" with one "pod"—a subunit of our clinical staff which is a self-contained team of physicians, nurses, nurse practitioners and unit clerks—at a time. Each month thereafter, we took an additional "pod" live on the EHR. With three pods, by March 22, 1999, 60 days after we started, we should have been seeing all patients on the EHR. We actually did it on February 26, 1999.

When we started the EHR implementation, we set a five-year target for being totally paperless. We instituted a Fahrenheit 451 Project, which was our focus on getting rid of paper as being too expensive and too inefficient to manage. We prioritized our implementation to maximize the benefit to the patient care side of the practice, even when it meant not immediately gaining all of the financial benefits of the endeavor.

The process redesign was dictated by the design of the workflow, which guided our template development. For the first six months, we used a double system. We pulled the charts and had the EHR and the paper chart side-by-side. Very quickly, however, the paper chart became an unnecessary redundancy. Once we began our scanning solution, which we delayed until October 2003, we were truly and completely paperless, three months ahead of our five-year schedule.

Staff Training was done initially by tutorials and subsequently by our establishment of a training room where new employees and personnel from newly acquired clinics can be taught the system and then can practice their skills. Because the workflow and the EHR is so intuitive in its processes, our providers rapidly learned to use the system. In fact, every provider has commented, after three to six months with SETMA, that they are “addicted” to EHR.

We made sure that in each pod there was a person who had been through a "train-the-trainer" intensive introduction to the functions of the EHR. That way, not only was IT available for troubleshooting, someone else was on hand to answer 90% of the questions raised. This system continues to work for us, putting experienced people with newly trained people. All of our staff indicates that it takes about two weeks to be very comfortable with the system. Obviously, it takes longer to be expert, but to be productive it only takes two weeks.

Subsequent to the initial "roll-out," we designed “helps” within the system so that new and old users can be helped through the system. One illustration is that when we incorporated 8,000 ICD-9 codes into our system, we placed three lists on the Assessment Template:

1. “Categories” which are in the ICD-9 Code list, such as Hypertension, Prostate, etc. This means that all ICD-9 Codes for each condition will be organized under this heading.

2. The “abbreviations” which are used as “categories,” such as DM for Diabetes Mellitus, OA for Osteoarthritis, and OM for Otitis Media.

3. The “abbreviations” which are used within a diagnostic “category”. This makes it easy for a provider to find any diagnosis which is needed in a multi-specialty group and to understand what the description means.

e) *Current State—Characterize the current state of implementation in terms of the intended users (physicians, nurses, etc.) and the uses of the EHR (capture of notes, prescriptions processed). Describe the clinical decision support in routine use (could include integrated displays of patient data, note templates, orders sets, rules-based prompting).*

It has been SETMA's intent that all members of the healthcare team would utilize the EHR; this includes:

- Physicians
- Nurse practitioners
- Nurses
- Unit Clerks
- Clerical personnel with access appropriate to their responsibility
- Management
- Hospital support team
- Physical therapy
- Home health
- Nursing Home support staff who works for SETMA.

Utilizing the EHR and specialty template development, SETMA has organized a number of special care settings to increase the quality of health care. Some of these are:

Pediatrics—SETMA's Department of Pediatrics is a full-service healthcare unit for infants, children and adolescents. SETMA will be offering the only childhood weight management program in the Golden Triangle, modeled after our adult weight management program. In addition, the "anticipatory guidance," "the Denver Scale," and other age-specific benchmarks from birth to adolescence are built into the system so that the healthcare provider or nurse can give consistent and quality counsel about patient care and child development.

Women's Health—SETMA's special services in women's health include cardiac screening, office gynecology, bone density and treadmill exercise testing. Special attention to preventive health care issues as they relate to women's health is emphasized. Again, template development and order-sets provide excellent process analysis for this area of care.

Pulmonology and Critical Care—SETMA's Department of Pulmonology provides extensive services in the care of patients with asthma, emphysema, deconditioning and critical care. With disease-specific templates for asthma and COPD and hospital order sets for pneumonia and asthma, SETMA's providers at all levels of training are led through a decision tree to excellence of care.

The Coumadin Clinic—Coumadin is a life-saving medication when used and monitored properly. Because so many new medications affect the action of Coumadin, SETMA has established a special clinic where patients can get their prothrombin time (Protime) check easily with immediate results. This saves time and makes sure the patient is getting the right dose of medication. Patients will also be given educational materials, which will tell them about foods they should not eat and the signs and symptoms of dangerous changes in their Protime. SETMA's Coumadin clinic is staffed by nurses and a Nurse Practitioner under the review of an MD. The EHR makes this possible without a decrease in the quality of care.

The Congestive Heart Failure Clinic—Through the electronic medical record, SETMA, in collaboration with the Physician Consortium for Performance Improvement, a national organization of the AMA, CMS (Medicare), the National Institute of Medicine and all Specialty Societies, has created a treatment and educational plan for helping patients avoid CHF if they don't have it; keep it from getting worse if they do, and/or helping the patient regain as much cardiac function as is possible through a medical-managed cardiopulmonary rehabilitation program. All SETMA CHF patients are evaluated with Cardiopulmonary Exercise Testing giving a sound, objective basis for evaluating functional class, pathophysiology and designing of a rehabilitation prescription. The EHR CHF disease-management tool guides providers to excellence of care with patients with CHF. The EHR leads to the correct designation of systolic or diastolic CHF and then guides the provider to the right treatment. The integration of evaluation, treatment, and specialty consultations via EHR maximizes quality, safety and cost effectiveness.

The Cholesterol Clinic—More than any other time in history, healthcare providers can help patients retain and in some instances regain their health. The aggressive and excellent treatment of lipid abnormalities is one of those areas. SETMA has designed a state-of-the-art cholesterol clinic to help patients avoid heart disease and/or to improve the function of their cardiovascular system. The treatment and educational tools which the Cholesterol clinic provide helps patients "take charge" of their own health. The disease-specific management tool also puts all providers on an equal footing regardless of their personal knowledge-base about lipids.

The Diabetes Treatment Program—All of SETMA's healthcare providers, whether at SETMA I, SETMA II or SETMA West End Medical Plaza, will evaluate diabetes treatment plans with assessment and treatment tools, based on national standards of quality care. In addition, patients are given educational tools on foot care, a healthcare-provider report card (so they can know if they are getting the best care available), sick-day care and many other subjects. In addition, the Physician Consortium auditing tool will be used to evaluate the quality of the care every time a patient is seen in a SETMA clinic.

Weight Management Program—The AMA has produced an adult weight management program funded by the Robert W. Johnson Foundation. SETMA has implemented that program by designing electronic functionalities, making it possible to bring to bear the entire ten-booklet, 200-page program on every weight management

encounter. In that weight management is a critical part of multiple disease states, such as hypertension, diabetes, lipids, CHF, etc., this EHR function brings tremendous treatment value to SETMA's patients.

Headache Clinic—One of the most debilitating problems in healthcare is chronic headaches. In a setting of competence and compassion, driven by an EHR-based disease-management tool, patients are evaluated for duration, frequency and quality of headache symptoms and diagnosed according to standards for migraine, tension, vascular and combination headaches. The clinical provides guidance about medication management and lifestyle changes to mitigate the consequences of the condition.

Life Time Health and Wellness—The principles of "aging well" are vital component of SETMA's Life Time Health and Wellness Clinic, which offers special services to those committed to living as long and as well as they can. This special clinic provides new and important services to those who are committed to excellence in their own health. The sound, scientific base for this program is reflected by the EHR-driven decision algorithms.

SETMA also provides outstanding, state of the art electronic supported care in the following settings:

Long-Term Residential Care—SETMA's care for the elderly is founded on our commitment to the sanctity of human life and preservation of personal dignity. We rely upon our electronic patient management with nationally acclaimed treatment tools for the special needs of those requiring long-term residential care, including skin care, depression, hydration, malnutrition, nutrition, and fall risk. All of these "treatment suites" are built on "rules-based prompting," guiding providers to the best treatment plan.

In-patient Hospital Services—If a patient goes to the hospital—and our goal always to prevent that when possible—because of SETMA's electronic patient management, the patient's personal medical records are available at all local hospitals—protected, of course, by rigorous security and multiple passwords. At SETMA, there is no more guessing about medications in the hospital. And, if a patient is in the clinic in the afternoon and in the hospital in the evening, the record of the clinic visit is available in the hospital. When the patient returns to the clinic, the hospital record is also available in the clinic making the transition of care smooth and continuous. SETMA's In-patient Service Team provides 24-hour-a-day, seven-day-a-week on-site, in-patient services to our patients supported by all of SETMA's IT functionalities. Whether in the ER, on the ward, or in an outpatient hospital setting, all of the patient's medical data is available at every point of service. This provides continuity of care and personal service to our patients, giving our patients confidence that all of their history and health data are being brought to bear on every medical-decision-making need.

Communication—Perhaps the most important of SETMA's services, is the patient's ability to communicate with us electronically through our website, www.setma.com, giving a new and dynamic way of interacting with healthcare providers. Our secure connection allows us to interact with patients, schedule and confirm appointments, and make referrals. Patients can also pay their bill via the website. Every contact with SETMA is documented in the medical record. The length of every telephone call and to whom the patient talked is tracked so that if the patient is delayed on the telephone, we can know why and how to prevent that in the future. In addition, during the summer of 2005, SETMA patients will be able to document their chief complaint, history of present illness, and review of systems for upcoming visits via SETMA's website.

Exercise Prescription—SETMA providers have the ability to personalize an exercise program for patients every time they come to the clinic, based on their current activity level, age, condition and gender. The exercise program calculates the patient's heart rate reserve and heart rate range for aerobic conditioning, among other things. It also provides patient-specific exercise goals for health, fitness and/or athletic performance.

Education and Information—SETMA sponsors the Live Doppler Radar on NBC, Channel 4. As SETMA looked for a way of serving the community, it became apparent that in health, the only thing which can hurt a patient is what they don't know. SETMA also provides a weekly health column for *The Examiner* newspaper. As patients read *The Examiner* and learn about new and old health issues, they will begin to see the principles and knowledge being applied to their care in all SETMA clinics. All of this information is available on SETMA's website and in SETMA's EHR.

In addition to the above, SETMA providers can also review:

- Any and all lab work in an over-time display or graph.
- Vital signs over-time is a valuable adjunct to the care of patients.
- All procedures can be reviewed over time so testing and evaluation frequency can be quickly assessed.

## Value

f) *Success in meeting objectives—Using the business objectives discussed above to organize the discussion, review the extent to which your practice has achieved the expectations it set for the EHR system. Formal research is ideal but not required. Utilize the best qualitative and quantitative evidence available, including physician and patient satisfaction and descriptions of transformed processes, as well as measures of quality, process efficiency, productivity, customer service, etc.*

SETMA has reached—and exceeded—all expectations we had in purchasing the EHR. In addition, we have transitioned from an electronic medical record to electronic patient management, which has increased the value of the EHR by providing increased quality of care, increased safety, decreased costs, improved patient/provider communications and the ability to evaluate provider performance.

We have documented the following benefits in accordance with our business case:

### End-to-end electronic patient management

Patients can request prescription refills on our website, with request automatically routed for physician approval and transmission to a pharmacy. In the exam room, caregivers capture charge-related data, create clinical notes, order lab tests, arrange referrals, set reminders for follow-ups and write new prescriptions—all without using paper. Transitioning to electronic patient management has resulted in improved quality of patient care, increased physician and patient satisfaction, quantifiable financial return on investment and increased operational efficiencies. Additionally, the continuity of care between the hospital and the clinic has made it possible to improve the quality of care, eliminating errors and failures to follow up on important issues.

### Improved quality of care

We are now able to manage patients as individuals, as a specific population, and as a preventive health initiative across all patient-care systems. Prior to implementing the EHR, SETMA had a 20% immunization compliance rate. Post EHR, it exceeds 80%. In addition, SETMA has initiatives for preventive health care, such as mammograms, pap smears, PSAs, etc., where patients are contacted when their records reflect a deficiency in their preventive care status.

Electronically, SETMA can identify deficiencies in preventive care, periodically notifying patients of their need for that care. This contributes to increased quality of care, patient satisfaction and improved outcomes.

Additionally, SETMA has implemented the Physician Consortium for Performance Improvement data sets for chronic conditions such as diabetes, congestive heart failure and hypertension, and chronic stable angina. We participate in an ongoing CMS disease-state management study in collaboration with the AMA.

SETMA also has disease-specific clinics for the following:

- Diabetes
- Lipid Management
- Congestive Heart Failure
- Coumadin Management
- Hypertension
- Adult Weight Management—Based on implementation of the AMA's adult weight management protocols developed by funding through the Robert Wood Foundation
- COPD and Asthma
- Headaches

These clinics are supported by template-driven, national-standards-of-care, disease-specific management tools. This allows SETMA's providers, regardless of their personal fund of knowledge, to perform at a superior level in managing complex, difficult patients.

The EHR and EMR have allowed us to launch aggressive, comprehensive electronic disease management efforts. During the past year we initiated the LESS Initiative – based on three factors common to virtually all specific disease management programs: Lose weight, Exercise and Stop Smoking. With the LESS Initiative, all patients are evaluated for their risk of diabetes, given a weight management assessment, provided with an exercise "prescription" and confronted about the need to quit smoking. Because of SETMA's electronic capabilities, this program is universal throughout our clinical practice, and 5,000 patients are assessed through the LESS Initiative each month.

SETMA has developed, through NextGen®, hospital order sets based on national standards of care for multiple disease states including diabetes, seizures, pneumonia, congestive heart failure, hyperkalemia, hypokalemia, diabetic ketoacidosis, and numerous others. These order sets make it possible for a provider, regardless of level of training, to initiate care with national standards of care quality as viewed by specialists in the field.

SETMA has established a continuum of care model of healthcare delivery by tying the clinic to the hospital, to the physical therapy clinic, to the home, to the hospice, to the home health agency, etc. This means that when the patient is admitted to the hospital, the physician is entering data in the same database. When discharged, the data is created in the same database. Therefore, when the patient returns to the clinic, the follow-up is done on all issues related to the visit as detailed in the discharge summary, which is already in the EHR. Regardless of the location of service, a common database is utilized for the encounter, establishing and maintaining the continuity of care. With active interfaces between the EHR and the clinical laboratory, the availability of lab data, the avoidance of redundancy and the elimination of errors are achieved.

Consistent with improved quality of care, the measured patient satisfaction with our care, and particularly their satisfaction with the documentation of their care through an EHR, is outstanding. While patient satisfaction is not the ultimate means of measuring quality, it is the measurement of *perceived* quality, which is a major issue in the quality of care.

### Comprehensive clinical documentation

With NextGen® EMR, we electronically document the full continuum of care, including:

- Over 260,000 patient encounters annually
- Over 672,000 patient calls annually
- Over 15,000 X-rays and more than 4,000 EKGs annually
- All nursing home patient visits
- All SETMA clinic physical therapy visits
- Return-to-work authorizations
- Payment waivers for appropriate Medicare and Medicaid charges
- All lab orders and reports for our in-house reference laboratory (we are currently implementing interfaces with national labs)
- All hospital admission histories and physical examinations, representing 40,000 hospital visits annually. Hospital visit documentation includes discharge summaries with diagnoses, medications, consultations, procedures, laboratory results and hospital course.

### Increased workflow efficiencies

The heart and soul of the EHR is the workflow association of daily appointments, lab and x-ray results, phone messaging and email, which is superbly done in NextGen®.

1) Improved prescription process. Previously physicians had to search for and locate the patient's chart, look up the patient's allergies and check for potential drug interactions, hand-write the prescription and give it to the patient or to the nurse. With NextGen® EMR, our physicians have immediate access to the patient's chart, and the system automatically performs allergy and drug-to-drug interactions checking. Prescriptions are faxed directly to pharmacies via the system's Fax Manager.
2) Streamlined referral management. We now manage the specialist referral process electronically at the point of care from any location, such as a clinic, hospital, office, etc. The referrals initiated during a

patient encounter are completed electronically and forwarded to the referral department from the examination room.

3) Enabled online communications. Patients can now securely email or message their providers, request an appointment, complete forms and questionnaires or view lab results online via our website. Additionally, our practice now receives referrals, billing information and lab data online.
4) Improved response time to patient inquiries. The amount of time required to handle phone inquiries regarding a patient chart has been reduced by 73 percent. The number of associated tasks to process these calls has decreased from 18 down to 2. Total annual savings exceed $103,000 as of 2002.
5) Improved drug recall process. Our drug recall process has simplified dramatically. With paper charts, if a drug were recalled there were two options: the patients would hear about a drug recall and come in for an alternate prescription, or a staff member would scan all paper records, identify which patients are taking the recalled drug and notify them. Now with the EHR, we easily identify which patients are taking the recalled drug with a database query, draft a letter to those patients, perform a mail merge, and mail the letter to the patients in a matter of hours.
6) Improved inquiry documentation. Telephone communications from patients are transmitted to the providers electronically, allowing them to easily access the patient's records with all the necessary elements (lab, allergies and medications). It allows the provider to document their response, and automatically and electronically alert the unit clerk and/or nurse of the proper action to be taken. This is both why and how SETMA is able to document more than 600,000 phone calls and responses annually in the EHR. With this workflow capability, at the end of the day, the provider is through, rather than having a stack of 30-40 charts with telephone messages attached which need answering. Also, the documentation of the response of telephone messages is automatically captured in the patient's electronic medical record.

Financial benefits

The following results are from a formal ROI survey done by an independent agency in 2002. While the numbers will be different today, they will only be improved and the cost savings will only be magnified in that in the interim, SETMA has doubled in size and productivity.

1) Increased income due to electronic super bill. Because we now bill automatically from the patient's examination room, our overall average charge per patient visit has increased from $171 to $206 (a 20% increase) and the average collection increased from $80 to $104 (a 30% increase). In 2001 alone, total billable charges increased by $2.1 million and overall collections increased by $1.4 million. This is partly due to the EHR and partly due to practice growth.
2) Increased revenue. Thanks to the lower supply costs, increased accuracy in billing and lower administrative overhead that resulted from using NextGen® EMR, we have seen an increase in revenue of nearly $3 million annually.
3) Reduced chart costs. The average working-hour cost to establish a chart decreased 85 percent from 8.0 minutes per new chart to 1.2 minutes—an annual savings of more than $22,000.
4) Reduced transcription costs. In one year of using the system, transcription costs went from $5.93 per visit to an average of $0.25 per visit—for an annual savings of more than $340,000.
5) Increased billable charges. Improvements in E&M service coding have increased our average billable charges for office visits by 4.23 percent—adding more than $150,000 in billable charges.
6) Reduced supplies costs. Costs for administrative supplies decreased from an average of $8.00 per patient to $0.97, a decrease of more than 87 percent. Based on the number of patients in 2001 (55,000), we have saved more than $380,000 in paper and supply costs.
7) Reduced chart staff. The number of administrative staff required to handle patient charts decreased by 76.7 percent (from $2.65 per visit down to $0.62) through the creation of an electronic health record—for an annual savings of more than $120,000 in administrative costs.
8) Decreased claim denials. Denials have decreased by 26%. This has reduced average accounts receivable by seven days, thus increasing actual revenues by $102,000.

Increased reporting efficiencies

1) Proactive patient management. With every single point-of-patient contact captured in a single place, we are able to create reports that identify resource-intensive patients and take appropriate proactive action to

increase their compliance with their plan of care, decrease the cost of their care, and increase their state of health.

2) Outcomes management. We can now easily verify that our physicians are utilizing "best practices" and performing with desired outcomes. In addition, on a number of disease-state-management data sets, a physician report card is given to the patient, which allows he or she to evaluate whether or not his or her healthcare provider is giving him or her excellent care.
3) Comparison of records quality. We are now able to compare provider performance as to quality of records and appropriateness of assessment.
4) Easier business management. Practice management is now a function of accurate data assessment. Through NextGen® EPM, SETMA is able to develop analysis of payer class, contractual relationships and accounts aging. This has made it possible to effectively manage the practice as a business.
5) Higher reimbursement. Recently in responding to a request for data to comply with CMS Risk Adjustment requirements, SETMA's reporting capabilities through NextGen® made it possible for this task to be done quickly and easily. This resulted in higher reimbursement for Medicare Plus Choice patients managed by SETMA through the HMO. Because of NextGen's EMR interactivity, SETMA's risk-adjustment results were significantly better than any other group in the IPA.

Increased physician productivity and satisfaction

1) Patient visits are now documented in the exam room—saving valuable time previously spent on dictation. This gives our physicians more free time to spend with their patients and families. This also improves the quality and depth of documentation, which improves safety and efficiencies of outcomes.
2) The NextGen® EMR enables our doctors to review test results, complete discharge summaries, and address other issues from any PC with access to the clinic's network. Selected users can access the system from home or at the hospital, enabling physicians and nurse practitioners to make fully informed decisions when reacting to patient emergencies on evenings and weekends. Also, it enables the provider to review, from home, lab data and or other information that has been reported after he or she leaves the clinic.
3) NextGen® EMR has greatly impacted the quality of life for our physicians. The system's customizable templates enable our physicians to practice medicine according to their individual workflow preferences—without being forced to follow a regimented process. By dramatically reducing dictation, our physicians have gained 7.5 hours per week on average, which they use to spend more time with their patients and families.
4) The association of ICD-9 and CPT codes during the placement of test orders increases revenue recovery while also protecting our patients from "surprise" charges from their insurance companies.

Improved quality

1) Increased Standards. The quality of care provided by SETMA, as measured by decreased lengths of stay in hospital, decreased readmissions to hospital, decreased morbidity of chronic conditions, increased compliance with national standards of care and effectiveness in plan of care, has improved dramatically since the implementation of the EHR. In fact, SETMA now performs to a standard one would traditionally expect of a predominately specialty clinic.
2) 100% audit compliance. Since installing NextGen® EMR, SETMA has been audited eight times for Health Plan Employer Data and Information Set (HEDIS) compliance. In every case, the result has been 100 percent compliance.
3) "No Deficiencies." Since implementing EHR, SETMA has undergone a thorough, three-day survey conducted by Blue Cross Blue Shield. During the study, the auditor extended her examination of SETMA because, as she said, "I have never given a 'no deficiencies' rating to any clinic." She ultimately concluded there were no deficiencies. SETMA received, according to her, the first "no deficiency" rating ever given to a clinic by Blue Cross Blue Shield. This is predominantly a result of the EHR.
4) High availability. We have been using the system fully for six and a half years. Total unscheduled downtime has only been twelve hours—equivalent to a 99.987 percent level of availability. This is particularly remarkable in that we use the system 24-hours-a-day, seven-days-a-week.

g) *Costs and benefits offsetting costs—Describe the costs of the EHR effort, including those of implementation, and any financial benefits realized to date that offset that investment. If the business objectives were based on a return on investment analysis, describe the anticipated and actual return.*

SETMA's initial investment in EHR was approximately $600,000 in 1998. This purchased the software, hardware and support for our initial implementation. At that time we had ten health care providers including seven physicians. Since that time, we have grown from one server to 30, from one location to five, from ten providers to 36, including 23.0 FTE physicians. In addition, we have expanded the use of the EHR to the hospital, nursing home, physical therapy, hospice and home health.

The additional expenditures for software licenses and hardware, including wiring, routers, etc. have been in excess of $1,000,000. Our IT Department was run until the past year with two full-time employees and one part-timer. At present, IT has five full-time employees and one part-timer. The annual department operation budget is $400,000. Capital acquisitions for hardware and depreciable items, without additional location expansion, range between $150,000—$200,000 annually. At the time of purchasing the EHR, our transcription costs were almost $20,000 a month and our size was 1/4 of what it is currently. We speculate that today our transcription costs would be just under $70,000 a month.

A formal ROI that was completed by an independent consultant in April 2002, yielded the following results:

- NextGen® EMR help cut medical transcription costs from $5.93 per visit in 2000 to an average of $0.25 per visit in 2001. Based on the number of visits in 2001, SETMA saved more than $340,000.
- The NextGen® application helped improve E & M coding, which increased average billable charges for office visits by 4.23%. This coding improvement added more than $150,000 in billable charges.
- After installation of the NextGen® application, coding and charge capturing improved. The clinic's overall average charge per patient visit increased from $171 to $206 (a 20% increase) and the average collection increased from $80 to $104 (a 30% increase). Based on the number of patients seen in 2001, total billable charges increased by $2.1M and overall collections increased by $1.4M.
- Through the creation of an Electronic Health Record, the number of administrative staff required to handle the patient's chart decreased by 76.7% ($2.65 per visit down to $0.62). The new procedure saved the clinic more than $120,000 per year in administrative costs.
- The average cost for administrative supplies decreased from an average of $8.00 per patient to $0.97, a decrease of more than 87%. Based on the number of actual patients (55,000), the practice saved more than $380,000 in paper and supply costs.
- The average man-hour cost to establish a chart decreased 85% from 8.0 minutes per new chart to 1.2 minutes, an annual savings of more than $22,000.
- The amount of time required to handle phone call inquiries that required the chart has been reduced by 73%. The number of tasks decreased from 18 down to 2. Total annual savings exceed $103,000.
- Because of better charting, the number of claim denials has decreased 26%. This has helped reduce days in accounts receivables by 7 days, thus increasing actual revenues by $102,000.
- With improved charting and documentation, the number of successful audits has improved and in the last six years the clinic has passed 100% of their required audits.
- From implementation of the EHR in January 1999, and the completion of this ROI evaluation in April 2002, between cost savings and increased productivity due to the EHR, SETMA realized almost three million dollars per year increased revenue.

No additional formal information has been collected as the growth and success of the practice has been such that no further documentation of the ROI has been necessary.

## Lessons learned

h) SETMA drove the process of implementation with the guiding principle that we refused to accept anything but complete and total implementation. We published a booklet entitled, *More Than A Transcription Service: Revolutionizing the Practice of Medicine with Computerized Patient Records*. We gave copies to our providers, our patients, and our payers… to anyone who would listen. We talked implementation; we dreamed implementation, and we implemented. It was with "sheer dogged endurance" that we accomplished the task. It was hard and it cost a great deal of energy, money and effort, but now that it is done, we couldn't be more pleased. And now, all of the things that were so difficult are easy; all of the things that took a great deal of time now almost seem to happen by themselves.

### Pitfalls to avoid

If a practice is to be successful in implementing EHR, they will, for a brief time, give more attention to the EHR than it seems they are giving to their patients. But, ultimately, the provider must not give more attention to the record than to the patient. After the implementation process, "high tech" will promote "high touch."

Another pitfall to avoid is failing to utilize the strengths and capacities of the EHR. If the EHR is only a glorified transcription machine, it isn't worth it. The practice of medicine and healthcare delivery are so complicated today they require systems solutions.

- Without the ability to track HEDIS data, it will be impossible to "prove" that you are doing quality work.
- Without the ability to examine patterns of behavior among the providers in your group, it will be impossible to improve the quality of care.
- Without being able to monitor the behavior of your patients, it will be impossible to affect the health of a population of people.

Without systems, none of these things can be done effectively. Systems must be fully utilized to capture, document and analyze all encounters to accomplish these objectives.

### Selling the EHR

Once a healthcare provider has been "sold" an EHR system, the sales task has only begun. Any successful implementation of an EHR requires the "selling" of the idea to several different groups. SETMA has never stopped this selling process to our providers, our patients, our payers and our community.

SETMA's patients now expect to have a record, which is complete, accurate and accessible. Their expectations are such that quality care for them begins with the capturing of precise and accurate data about their healthcare events whether in the clinic, on the telephone, or in the hospital. SETMA's healthcare providers now expect to challenge every patient with preventive healthcare issues, many of which are irrelevant to the event which precipitated the current encounter, but each of which addresses long-term health needs of every patient. SETMA's customers, the payers, who pay our charges, are coming to expect the kind of documentation which gives them the ability to properly assess the quality of care and appropriateness of care which their membership is receiving from SETMA providers.

Perhaps the greatest lesson we learned was that it is never either too late to start or too early to start implementing a system. While the acceleration of the curve of acceptance of EHR among physicians is rising, it is still early in the process. Now is the time to get started. The hurdle is significant but once surmounted, the benefits are enormous to the patient, to the provider, to the practice, to the payers and to the public.

In any organization that is going to successfully implement an EHR, there has to be the following:

- A champion who is respected by most of the providers and who is totally committed to the project.
- A vendor with a proven track record for successful implementation, support and continued product development.
- A vendor with a sound financial position. The last thing any physician wants is to be presented with the source code as the vendor goes out of business.
- Adequate support staff both managerial and technological.
- Adequate preparation and training, but commitment to a final schedule for implementation. Many EHR projects fail because of poor preparation, while others fail because excessive planning endlessly delays execution and demoralizes stakeholders.