Chapter 2
A View from the Trenches: Primary Care Physicians on Electronic Health Records

Neil S. Skolnik, Mercy Timko, and Charissa Myers

Do not let what you cannot do interfere with what you can do.
– John Wooden, Basketball coach, UCLA

Abstract It is one thing for pundits in ivory towers to describe the correct approach that practicing physicians should use in selecting and implementing an electronic health record system, for them to describe the essential reasons why it is to the physician's advantage to change over as rapidly as possible to a computer-based system of healthcare. It is another thing to actually make that change. Generals talk about the "cloud of war," by which they mean that even the most carefully developed plans, conceived of in the quiet of the planning room, have to be carried out in a radically different manner than they planned when they face the confusion, disclarity, and realities of the field. This shift from theory to practice is also true of complex systems in medical practice. In the cloud of the office, the physician is often running four patients behind and trying to integrate a patient's psychosocial needs with their medical needs while another patient down the hall is getting an EKG for chest pain. This is occurring simultaneously with trying to understand and integrate the new electronic health record (EHR). It isn't correct to say that knowledge and planning doesn't help; it does and that is why we have written this book. It remains important though to acknowledge that there are different sources available for learning - one is expert opinion and knowledge, the other is experience, the experience of individuals with whom you have something in common and who have decided to implement a system like that which you are considering and to hear their experiences, good and bad, with those systems. The goal of this chapter is to provide readers with candid, first-person accounts of primary care physicians' experiences with a variety of EMR systems from a variety of settings. This should provide a balance of inspiration and consolation regarding a transitional experience that is changing the way medicine is practiced.

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It is one thing for pundits in ivory towers to describe the correct approach that practicing physicians should use in selecting and implementing an electronic health record system, for them to describe the essential reasons why it is to the physician's advantage to change over as rapidly as possible to a computer-based system of healthcare. It is another experience to actually make that change. When looked at from a safe distance, many things fade away and others seem clear. Generals talk about the "cloud of war," by which they mean that even the most carefully developed plans, conceived of in the quiet of the planning room, have to be carried out in a radically different manner than planned amid the confusion, disclarity, exigencies, and realities of the field. This shift from theory to reality is also true of planning for implementation of complex systems in medical practice. In the cloud of the office, the physician is often running four patients behind, and trying to integrate a patient's psychosocial needs with their medical needs while another patient down the hall is getting an EKG for chest pain. This is occurring simultaneously with trying to understand and integrate the new electronic health record (EHR). It isn't correct to say that knowledge and planning doesn't help; it does and that is why we have written this book. It remains important though to acknowledge that there are different sources available for learning – one is expert opinion and knowledge, the other is experience, the experience of individuals with whom you have something in common and who have decided to implement a system like that which you are considering and to hear their experiences, good and bad, with those systems.

The goal of this chapter is to provide readers with candid, first-person accounts of primary care physicians' experiences with a variety of EMR systems from a variety of settings, geographical locations, and backgrounds. Our hope is to provide readers with a balance of inspiration and consolation regarding a transitional experience that is changing the way the medicine is practiced. As the following physicians share their opinions, stories, trials and tribulations, hopes and fears, positive and negative sentiments, we believe one can glen many practical tips and wisdom hard-earned through experience, and perhaps a sense of community.

Interview:
David Dipietro, MD
Buckingham Family Medicine
Buckingham, PA

Dr. David Dipietro is a family medicine physician at Buckingham Family Medicine, practice located right outside of Doylestown, PA. He graduated from Temple University School of Medicine in 1985 and completed his residency at Abington Memorial Hospital. Upon completion of residency, Dr. Dipietro joined as faculty staff at Abington Family Medicine for 2 years prior to joining the Buckingham

Family Medicine practice in 1990. The practice which was once comprised of three physicians has since grown and now houses six physicians, three physician assistants, and has two office sites. The practice, which serves about 20,000 patients, is associated with Doylestown hospital but is owned by three of the six physicians. Each sees about 20–25 patients a day.

My partners and I decided to look into purchasing an EMR system about two and a half years ago. There was a strong push from Doylestown hospital and physicians in the community, who had already transitioned, as well as the governments' reimbursement and an eventual threat of cutting Medicare payments in 2015. It seemed like the right time to do it. We weren't sure what to expect. We brought in a free-state consultant who made recommendations and we reviewed several EMR systems. We then invited those vendors and a few others we had read and heard about to our office to demonstrate how their product worked. They basically walked us through a typical patient encounter. We then narrowed our selection down to two or three vendors and eventually chose one. This took about 6 months. Once we chose our EMR system, the company sent their support team to our office to train us for a few days and they stayed for an additional 2 weeks once we went live. We decided that the EMR system which best suited our needs was Imetica, now called Aprima. The main things we considered when choosing a system were (1) ease in writing notes; (2) others in the community speaking highly of it; (3) good customer support during and after implementation; (4) within our price range; and (5) CHITT certified, which is required for government reimbursement.

We knew that there would be a transition period going from a paper office to a paperless office. The largest challenge with this transition was getting buy-in from the staff. Fortunately, the majority of our staff knew how to type and had some computer knowledge. It certainly changes your practice. Prior to purchasing an EMR, we hoped that it would primarily help to facilitate "stream-lining" certain paths in our office and in the long-run save money by needing less staff to run the office as well as needing less office supplies.

Now, if you were to ask me if my expectations have been met, I'd say certainly not, but I think that's true for most practices. You see, the implementation process takes a few years. That's what people have to be aware of up front. Some people with whom I've talked say that you actually increase your staff as well as your overhead in the first year or two. We found this to be true. In our practice, we've not seen so much elimination of personnel and a shift in their job-title. Where we once had staff pulling charts, they're now responsible for scanning things into the system. I had some idea that this would be the case going into it, but the returns on our investments have been slower than I'd hoped. I'm still waiting on the government reimbursement, and my cost has certainly not decreased as I had hoped.

Initially, having an EMR adds a lot more time to the day and the amount of work I have to do at home. For example, pre-EMR, if I finished seeing patients at 5 pm, I'd be out of the office at 6 pm, but now I'm probably looking at 7–7:30 pm adding about an hour to an hour and a half to my day. I never use to bring work home, now

I bring work home daily adding an average of 4–5 h nightly work that I didn't have before.

So far having an EMR has been a mixed experience. I like that the EMR streamlines a lot of work in our office. For example, in a paper system, when a patient calls the office, the receptionist takes the message, pulls the chart, brings it to the doctor, the doctor writes a message, returns the chart to nurse who calls the patient back with the response, and then the chart is re-filed. With an EMR, the message is sent electronically from the front office to the doctor directly who responds and sends the message back. It cuts down on chart movement around the office. You don't have to worry about not being able to find a chart. Electronic medicine refills are definitely easier. The pharmacy electronically sends a refill to my inbox, I press a button and it goes right out to the pharmacy. As time goes on and charts are retired, there will be less and less pulling of charts and eventually this will save a lot of time and hassle. Another benefit is that notes are typically completed the same day the patient is seen. As a result, turnaround billing is done quicker. Also, if my partner sees a patient and the note is completed by the end of the day it is easily accessible from home. If I'm on call and a patient calls that night or the next day, the note is readily available.

One of the pitfalls of EMR is that it frees up staff time, while more work was now being put back on the physician. It makes it harder on us. I feel like I am doing more work now that used to be done by the nursing staff. For example, refills used to be delegated to the nursing staff, but now refills are done by the physician. This adds more time to your day as a physician. Say you have 90–100 encounters per day (encounters being patients, labs, refills, questions, phone calls) that take only 30 s to a minute a piece to address. Each task does not take long, but since many of these tasks used to be done by staff and are now being done by me as the physician, there is an additional hour and a half added to my day. These little increments of time add up.

With regard to patient interactions, I would say EMR has probably had a negative effect. The EMR takes a getting used to. Its interference during interactions is something you have to be aware of and guard against. You get so caught up with the computer and typing that you have to be conscious and make an earnest effort to maintain appropriate, healthy dialogue with patients. Fortunately, in our office we have laptops so we can face our patients, but I know of many offices that use desktop computers and the physicians have their backs turned to the patient. It is hard to maintain eye contact while typing. Patients seem to be not happy with the EMR, but they too are making the best of it, because they know it's the way to the future.

There are hidden costs to the EMR. During initiation of the EMR, we had to cut back on the amount of patients we saw while we were learning the system and adapting to it. In translation, this resulted in a loss of income. We were forced to scale back for our training period (1–2 weeks) and the implementation period (6 months). We eventually had to get back to where we were before as rapidly as possible. During the implementation stage, we saw two patients per hour which equates to 10–15 patients a day (down from 25). It took about 6 months to get back

to full speed. Financially this was too long. This equates to about $100,000 of lost income during that time period. What most people don't realize is that, in addition to the upfront cost and wage loss, there are a lot of hidden costs involved. It's a big investment.

In retrospect, I wouldn't do anything different. I am happy with Aprima and I would choose them again if I had to do it all over again. When I advise others about acquiring an EMR, I emphasize finding an EMR system with good customer support. I would also make sure to go with an EMR system that will likely be around for the long haul. I think one problem today is that there are so many vendors who want to tap into the market. You need a company that is going to be around for a while. It doesn't necessarily need to be a bigger company although bigger is sometimes safer. I think it's important to look at a variety of EMR systems because they are all different and what's good for one practice may not be good for another. In a primary care practice, where time is valuable, you need a system that makes life easier for you and saves your time. This can be as simple as finding a system with the least amount of button clicks, pages to scroll through, and a system which makes writing notes quick and easy.

Life was definitely easier in the paper world. We are now a year and half in and I believe it is going to get better. I see movement in a positive direction. We ran into IT problems (frozen screens, trouble-saving notes, Internet going down) without which things may have gone a little smoother. Most things have been ironed out but IT problems still occur about once in a month. You need to experiment with whatever EMR system you are considering.

Interview:
Lynn Ho, MD
North Kingstown Family Practice
North Kingstown, Rhode Island

Dr. Ho is a family physician in solo practice in North Kingstown, Rhode Island and has been using Amazing Charts since the inception of her family medicine micropractice in 2004. She currently does alpha testing for Amazing Charts. She worked for 14 years in the Community Health Centers of RI as an employed physician prior to starting her own practice. She graduated from New York University School of Medicine in 1986, followed by family practice residency at the University of Rochester in 1989.

Her current solo micropractice consists of outpatient family medicine without obstetrics. She cares for a panel of 750 patients, with 30–50 visits per week, 30–60 minutes allotted per visit, and employs no staff except for herself and a part-time in-house biller. Her practice successfully utilizes multiple technological modalities in addition to Amazing Charts, including open-access scheduling as well as online history-taking prior to in-person consultation. She describes her office as one that is "paperless technology-enabled and patient-enabled." She is on the faculty of the Ideal Medical Practices National Collaborative Project as well as the clinical faculty of Brown University Medical School.

I set about selecting an EMR when I was starting up my own micropractice. It made sense to move to an electronic system at that time. I needed a low-cost system, as my current practice is a low-overhead practice. A no-cost system (such as Practice Fusion or other advertising/data mined "free" EMRs) did not exist at that point. Although there were several open source systems around at that time, I thought that they required too much user effort. In the context of setting up a new micropractice and jumping off the ledge of being employed to being the business owner, in the grand scheme of things, it was just a minor decision to select and implement an EMR.

I expected that the EMR would help with documentation, especially legibility issues and access issues. These expectations have been met and exceeded. Before starting my own practice, I was not aware that documentation was such a costly, timely game that is forced upon us by the healthcare system at large. It took a while and a number of tools to be able to document efficiently. The EMR is not faster than paper, but it is more legible, accessible, and complete. In retrospect, I really cannot think of anything I would have done to better align my expectations with what occurred in reality. I think I was well prepared when I set out to do this on my own.

Implementing an EMR takes time. I would offer this as advice to physicians about to embark on this task. Implementation seems slower than it should and there is a definite and steep learning curve. It generally looks like the bigger the group or organization, the harder and possibly slower it could be. Even for me with a staff of one (myself), a stepwise implementation was in order – unable to go paperless from day 1, I was unable to leverage patient documentation tools until I realized I needed them, for example.

The best aspects of EMR, as previously mentioned, are the legibility, accessibility, and documentation it provides and ensures. The worst aspect of EMR is the utter and total dependence on technology for a working office. If your tech goes down, you are "hosed." This reality has happened in my practice and I've had to move back to paper for a day or so. It makes for long nights on the backend of seeing patients—the times when the technology malfunctions require fortitude. The biggest challenge in transitioning to EMR in my experience was adapting office workflow to EMR. If in a non-solo non-micropractice situation, the most important task likely would be buy-in from each member (physician and non-physician) to the concept of EMR as a whole. Without everyone's investment, it can be cumbersome.

In terms of how the EMR has changed my practice, I would say it's better than it would have been with paper: more efficient and effective, less costly than paper charts which require storage costs and more. I am working currently on registry concepts (outside of my EMR and now within it for quality-monitoring) though I can and do this with a separate non-EMR add-on to the electronic office suite.

I don't really feel that the EMR has affected my interactions with my patients. They are generally wowed by my setup and use of technology. Those who were not impressed have gone away, but they were few in number. Occasionally, I find myself staring at the computer... which I try not to do. This does not happen very often.

If you ask whether I'm happy with EMR, happy is not a word I use around EMR implementation. I could be satisfied – actually, yes, I would say that I am satisfied.

Interview:
Dr. Patrick VanSchoyck
Mingo Valley Medical Group
Tulsa, Oklahoma

Dr. Patrick VanSchoyck is a family medicine physician in Tulsa, Oklahoma. He is also a member of the Oklahoma Medical Reserve Corps and is licensed to aid in FEMA disasters. He has had a direct hand in Hurricane Shelter OKC, opening the Camp Gruber Shelter as well as a Red Cross shelter in Lanai, Hawaii following a dam rupture. He received his Bachelors of Arts and Sciences in Mechanical Engineering at the United States Military Academy, West Point, New York. He served in the US military for 5 years prior to going to the Oklahoma University College of Medicine and did his residency at the Oklahoma Family Medicine Residency Program. Dr. VanSchoyck had firsthand experience with EMR while working for OMNI, an 80 physician primary care system located in Tulsa. It is owned by St. John's hospital, a catholic run 600-bed facility. Five years prior to leaving OMNI, they implemented Practice Partner EMR, but since opening his own practice, Mingo Valley Medical Group, he and his partners have temporarily gone back to a paper chart system which he believes has generated higher revenue than that generated with Practice Partner. He has now been off EMR for two and a half years.

Dr. VanSchoyck thinks although EMR is inevitable, the key question one has to ask oneself is "Who is EMR for, who is it benefiting?"

While at OMNI, we spent about 2 years looking for a system that best suited our needs. We wanted a system that allowed us to print and transmit prescriptions, help with coding, as well as one that had diagnosis-based templates and a reminder system, for example "your patient has CHF, did you start an ACE inhibitor?" The hospital primarily wanted a system that allowed us to send and receive data from their computerized system, including the ER. Prior to purchasing an EMR system, my partner, Dr. Rodney Hollaway wrote his own EMR on a MAC system. In retrospect, it was a much better program than the 1.4 million dollar system we eventually bought. It consisted of three MACs in our office and he made templates that you could manipulate and merge. We didn't have security issues and we didn't have to change anything. It did all functions that are being recommended by today's EMR. The system was eventually removed, probably because it was too functional, not requiring IT enough, and the hospital ran on Windows and I think they wanted all their satellite sites to be on the same system. Although I had some knowledge surrounding the various EMR systems out there from attending annual AAFP conferences where there were various EMR vendors displaying their product, the final decision about what EMR system to purchase was ultimately made by the hospital and we ended up with the least expensive, least functional one. This brings me to an important issue. Although there is a lot of hype about how great EMR is and

how well it will benefit the physician, I believe instituting EMR systems are mainly for the benefit of hospitals. The hospitals want to be able to look at your data without your permission. Hospital people are looking through your charts so they can implement pay-per-performance. Hospitals want to own our charts as well as access to patients.

Mingo Valley Medical Group is divided into two offices, one having four physicians and the other having six physicians. The four-physician group has integrated Next Gen EMR. We in the six-physician group are still looking for a system that works for us. Some of the things we are looking for are how many clicks it takes to get the job done. The hospitals don't care about this. If you have more than three clicks your EMR isn't working. Although I am aware of the eventual need for implementing an EMR, one of the things I am looking at is the smart pen. It memorizes everything you write and everything it hears. You then dock the pen to your computer, it gets transcribed to your computer (in your handwriting) and it becomes a permanent part of the chart, a hospital record. There is no question that we can't function without an EMR, but this smart pen is something to consider.

My experience with EMR basically boiled down to a loss of income that I never recovered until I decided to abandon Practice Partner and went back to paper charts. I personally felt that the EMR didn't allow me to work to the top of my degree. A paper system is more reliable. It never goes down. It's easily accessible. With EMR if the electricity goes out or you have a power surge (which happens frequently) the EMR will shut off and you are faced with an office full of patients but no chart to look at. One day, our EMR system went down because someone lost control of their car in a thunderstorm and ran into a tree near our office. Our system was down for a few days. That's why I kept all my charts in my office while at OMNI.

The EMR had a negative effect on patients' relations. All the physicians were too busy typing, often with their backs to the patients, to ever make eye contact with the patients. If they decided to jot down notes and wait until later to complete the EMR, they infringed on their free time and ended up having to take their work home. But of equal importance, you lose out valuable information, like is my patient lying, do they appear frightened or sad, are they favoring an extremity, and so on. You become estranged from your patient. EMR significantly impacted the amount of time each encounter took up. It increased the amount of time it took to have a MA take the patent back to a room, take vitals, and then enter the patients' vitals and chief complaint into the EMR. To bring up the EMR in every room took multiple repeated clicks placing codes and passwords which delayed my contact with the patient. Then by the time I got into the room, the EMR would go into sleep mode and I'd have to re-enter my security information. A chart in a door slot is relatively simple and secure. EMR also affected patient interactions in the sense that it decreased the number of patients seen in a day. Before implementing EMR I'd see on average 24–28 patients a day, after 18 months into Practice Partner, I was still only seeing 18–20 a day. This equates to loss of about $35,000/yr. In addition to income loss, secondary to seeing fewer patients, there were losses due to inadequate coding. In my experience, most EMRs do not rank order the diagnosis for maximum insurance collections or billing. Practice Partner didn't even annotate whether

the physician should do a slightly more involved interview in order to get a higher reimbursement. If you have an EMR, my best advice is to insist on a salary. A full-time employee physician in a hospital system is worth about 1.9 million dollars per year. If you are seeing fewer patients with an EMR, which you will be, and if your income is based on production, you won't be able to survive. Our hidden overhead cost was absurd. We paid for frequent IT visits, annual EMR maintenance fees, revenue loss from fewer patients, and the unspoken cost of having to send reports (referrals, labs, imaging, etc.) offsite to get scanned in. This resulted in not only heavy cost but periodic loss of information. We also coded separately, so we had to pay to have our information sent to an offsite billing facility.

With regard to writing and refilling prescriptions, EMR did help to facilitate this process but once again, a process that use to take a mere few seconds (writing out prescriptions), now takes a few minutes. The EMR allowed me to print my prescriptions, but at a remote location which means I still had to leave the room, sign it, then return to the patient's room. I am aware that this is more of a hardware problem rather than an EMR problem but the cost of purchasing the EMR was so great that we could not afford to have printers (and print cartridges) in all the examination rooms. Not to mention, the EMR was never up to date with the list of medications for printing.

On a positive note, Practice Partner made very pretty notes when they are completed. It allowed me to drag FH, SH and PMH from documented in-previous visits and drop them to new encounters. On the down side, once a note was saved on the EMR it could not be removed no matter how wrong it was. Labs would drag onto the wrong patient and we were never able to move them. Not to mention, Practice Partner had fixed formatted diagnosis templates which prevented me from merging two templates into one when a patient had two or more complaints.

I'm an early adopter of technology and actually embraced EMR, but I was very disappointed with the time it took to make the notes, resulting in fewer patients being seen and extra hours of work brought home. All this was known and allowed (by the hospital), despite the HIPPA risk. Theoretically, you can't leave the office without completing charts. So going home and remotely accessing your note is a huge HIPPA risk. A fellow female partner of mine used to see her patients, go home, cook, play with her children before tucking them in for the night, then try and spend time with her husband before staying up until two in the morning completing her charts. She'd come in exhausted nearly every day. Out of the 80 physicians in our network, five left after EMR training period due to discouragement. Two out of eight physicians in my office experienced carpel tunnel syndrome after implementing the EMR. The EMR resulted in highly trained physicians acting as transcriptionists. Ultimately, I had to hire a second MA to be in the room with me transcribing while I interviewed, examined, and discussed the diagnosis and treatment plan with the patient.

Now that I have been on paper charts for 30 months, I am quite pleased with the change. I am still trying to figure out how to integrate technology into the examination room. I am experimenting with pre-printed exam forms that are checked and written by hand using a smart pen and then transcribed on a laptop with character

recognition. I use a palm pilot with Epocrates for updated medication information. I am also on a search committee for a new EMR system for our 10-physician group, but so far we have rejected three because they had many of the same problems as we encountered previously. We are still looking for a system that we feel works.

Interview:
Cesar Duque Gomez, MD
San Ysidro Health Center System, Chula Vista Family Clinic
Chula Vista, CA

Dr. Duque Gomez is a family physician and faculty member within the San Ysidro Health Center System, a group of 10 community clinics in central and southern San Diego, CA. He is originally from Columbia and immigrated to US in the 1980s. He attended medical school at the University of Wisconsin, Madison and completed his residency at the Scripps Mercy Hospital in San Diego, CA. His interest in EMRs grew during his time with the San Ysidro System. His special area of interest regarding EMR is primarily end-user training and the broad effects it has either in making an EMR system a success or failure. He is currently playing a major role in his organization's transition to a new EMR system.

Our decision to go with an EMR was mostly economically driven based on grants, in addition to internal and external pressures. The San Ysidro Health Center System was given a grant approximately 8 years ago to select and implement an EMR. There was no physician participation in this endeavor. Companion EMR was selected by the administration, the choice was purely cost-driven, and to be used by 110 physicians within the system. At first it was selected and implemented in only one clinic, which also happened to be the site of our residency program. The 8 years that have passed with the current EMR have been filled with frustration and struggle for the physicians working within our current system. I and one of my colleagues have achieved superuser status in effort to help others learn the system from within, but the struggle has continued. Because of this negative experience, a committee was formed specifically to handle new EMR selection and implementation and we sought the help of the Council of Community Clinics. The Council has reviewed many EMR products and has a good knowledge base. The San Ysidro Health Center System is currently in the process of choosing between Nexgen and eClinicalWorks. This will be funded by grants from the federal stimulus package.

The selection process this time around has been very interesting and entirely different with physician or "end-user" input playing a major role. Physicians comprise 40–50% of the committee and have strong leverage, in addition to administrators and medical records personnel who also have valuable input. As mentioned before, both external and internal forces play a role in this process. As a public state clinic system, there are extensive reporting requirements, mainly of demographic data, that the selected EMR would need to meet for this system. Nexgen has great reporting and data mining capabilities, but eClinicalWorks is more user-friendly for

physicians. We are trying to choose between the two systems. We do not want to sacrifice physician–patient interaction and healthcare delivery for better demographic reporting.

We have been doing site visits, observing different EMRs in action, speaking with physicians using them, and test-driving them. This experience has given us much hope for implementation of our next EMR, but by no means do I expect a perfect experience. In general, I feel that the common expectations for EMRs including increased efficacy, revenue, and reporting as well as decreased loss of charts and decreased paperwork are not being fulfilled. Efficiency is not better, revenue is about the same or less, and paperwork may be reduced, but certainly still exists. Regardless of the EMR being used, myself and many physicians can still work faster with paper charts; "end-user speed" is the final denominator. At best with an EMR, I may see 11 patients per half day session; with paper charts I could see 24 patients in the same amount of time. Voice recognition does not help in my experience. There is still paperwork. Revenue has not increased: while coding and collection may be more precise, the decline in the number of patients seen more than takes away any ground gained. Currently, reporting is not improved with San Ysidro's current EMR, as the EMR and practice management programs cannot communicate. And while paper charts may no longer be lost, when the EMR system goes down between 1 and 3 h on average per 40 h work-week, the catch-up and backlog of patients and charting is tremendous – it was as much as 5 h prior to superusers being trained to help. Such crashes led to irate physicians within the system calling the system supervisors and contributing to an overall poor morale.

Exercising more forethought and involving physicians heavily in the selection and implementation process as well as investing more resources in user training would be key to having the next implementation successful. Careful selection followed by implementation is the most critical step and it must be most carefully planned. User training is also a key; if one can't use the system effectively, then the system is not very useful. Physicians as the key end-users should be very involved from the very beginning through to the more complex tasks and challenges such as the creation of templates and automated medication lists that they will be using constantly. An implementation not planned carefully can result in templates and patterns set that may not be user-friendly and may even be detrimental.

My advice to those departing on this journey of selecting EMR is to be vigilant and deliberate. Plan carefully, investigate, go and watch EMRs being used in real life, and talk to those working with them everyday. Be thoughtful about every aspect of implementation. San Ysidro has plans for phasing in physicians gradually; at my clinic we have three attending physicians and a large residency program. We anticipate it being a challenge for those who are not computer-savvy. The extra time and resources invested in training users thoroughly, resulting in confident users with a solid foundation, will go as a significant way to a smooth transition for us.

The best aspects of having an EMR include ready access, the possibility of remote access, and e-prescribing which is a tremendous useful tool. Easy access to lab results and notification of urgent results are extremely valuable as well. On

the contrary, lack of reliability, which is system-specific, tops my list of the worst aspects of using an EMR. When the system is down, everything is down. As mentioned before, other challenges include the decrease in productivity due to end-user speed, charting taking longer time, and resultant drop in number of patients seen. I think it can also significantly cut interaction with patients; with more physicians focusing on the computer screen, patients will often stop talking, and the overall nature of the encounter can take on a far less personal tone. The interaction time is cut often due to the increased need for time for charting. An additional concern for us as a residency training site includes impact on the residents' graduate medical education/training; they often get frustrated while trying to use the system, resulting in less time and energy for learning medicine, less interaction with their patients, and an overall sense of being rushed and distracted.

The bottom line is that the EMR we currently have and are about to abandon has changed our practice in negative ways: it is archaic; we had no role in selecting it; it has resulted in decreased productivity, decreased efficiency, and increased physician frustration. Yet, out of this negative experience, we have reaped much wisdom and we are hopeful for the next one to be better; not perfect, but better – with a smarter, smoother implementation process and a chance at working through the system, working out glitches, and reaching a point of steady equilibrium and productivity without sacrificing physician–patient interaction and quality of healthcare delivery which must remain as our utmost ideal and most important goals.

Interview:
Mark Cohen, MD
Lifetime Health Medical Group, Perinton Health Center
Pittsford, NY

Dr. Cohen has been practicing internal medicine and pediatrics since 1989. He is the Chief of Internal Medicine, Chief of Healthcare Informatics, and Chair of Clinical Excellence in the Lifetime Health Medical Group in upstate New York. He is a 1985 graduate of Hahnemann University School of Medicine and completed residencies in internal medicine and pediatrics at Albany Medical Center Hospital in 1989. The by-line to his e-mails is "Failure is not an option." With this sentiment he has championed EMR and guided the implementation of a system for 700 employees, 12-location primary care medical organization, which serves more than 100,000 patients.

In 2003, my organization, Lifetime Health Medical Group, started planning for the selection and implementation of an EMR. First, I was given the task of selecting one, so I started searching the web and reviewing demo CDs. Soon the organization had decided to merge several large healthcare groups in three upstate NY cities, and simply adopted the system, Nexgen, already being used by one of those groups in Syracuse. What I discovered was that the system being used was not actually being used as an EMR, but simply as a practice management system. The information technology department had implemented it, modified it to work in conjunction

with paper charts, and bypassed the EMR functionality all together. Within a year, I attended a user group meeting for Nexgen to learn about the system in detail from those already using it. Nearly 4 years later in February 2007, after multiple presentations at Lifetime, demonstration, and getting approval for the investment of 2 million dollars, the system as an EMR was implemented – a process which then took 18 months.

Implementation necessitated developing two entirely different plans for offices in the cities of Rochester with four medical centers and five offices which were entirely paper-based, and in Buffalo where four offices were already using a text/DOS-like EMR with dictation. I worked very closely with the administration in guiding the implementation process. A steering committee was formed. The decision to go with a wireless system was one of the first and most important decisions made – for mobility and ease within sites, not necessitating logging in and out constantly to preserve privacy and security, and to prevent the circumstance of physicians looking at walls rather than their patients. The Buffalo site, already using an archaic system with hardware, replaced one element at a time with new applications and modules being unveiled as time progressed. Rochester, starting from paper charts, was transitioned site by site. Entire medical records were scanned for approximately 100% of patients at the Rochester site and 80% of patients at the Buffalo site. All paper records were destroyed.

Laptops with touch screen options were introduced; template clicking versus free-typing is optional, and all physicians were trained on Dragon voice recognition for the option of dictation. All can type, click, or dictate, although free-typed information will not be available for data mining. The lab interface is enormously helpful. The paper trail that used to take up to 2 weeks from start to finish can now take less than 8 h, from physician review of a result to the patient being informed. In transitioning, at one of our health centers, we now need only one person instead of three to manage incoming paper documents, with things growing even faster now that most lab results are coming electronically.

Detailed workflow studies were conducted over considerable time for front-desk staff, nursing, PA's, and physicians. Training modules were issued to every staff member. Training is by far the single most significant factor in success of transition and implementation of an EMR. Accommodations must be made for individuals' differences in learning, in prior experience with technology, and speed in acquisition. Every person received 10 h of traditional classroom training and a manual; this was followed by having support staff shadow the staff member in vivo while working, with support staff in-house for 2 weeks. All schedules were cut by 50%, from four patients per hour to two patients per hour, with no annual physicals included. Over time, information sessions were held for questions/issues and idea sharing. Superusers or "physician champions" were trained. I still work in this role and feel that the essential time for physicians and healthcare workers to learn and the time when they will truly remember how to use the EMR for various tasks is when they are at the point of care, needing to get something done. The Rochester site saw an attrition of two physicians who left because of the EMR implementation.

We expected the EMR to effectively remind and prompt healthcare providers regarding health maintenance issues, patient monitoring, etc. It did not! It is very good at recording, having all information at your fingertips at all times with nothing "getting lost," as can and does happen in the paper chart world. Incorrect "filing" is extremely rare with EMR as there is a double-check of scanning and electronic records that makes the EMR more complete and exact; there are no storage issues and no "chart mistakenly filed within another chart." The beauty of EMR is that information is available to everyone who wants or needs it at all times. Nurse, physician and front-desk staff can all be accessing the same chart at the same time for various purposes. Communication can also occur via the EMR leaving no need to go and find physically a nurse or desk staff member to perform a task. Other benefits include the ability to finish charting from home or other locations outside the worksite; total access anywhere at anytime. The system has become a data mining goldmine with the ability to run queries and perform quality tracking very easily. We use CINA, a data aggregator which mines data, scouring the patients' records and provides a one page summary of the patient's action items.

As far as advice for physicians about to embark on the task of selecting and implementing an EMR, I would say the following: Go to user group meetings. Talk to people. Visit sites and watch the system in action. It is worth the investment. There are drawbacks that one must expect. When the system goes down, e.g., the router has a bug, electricity is out (e.g., squirrel ate through wires which really happened to us!), or interference from nearby wireless networks, the system is down and things grind, at times, to a halt. There is maintenance that must take place. Upgrading templates can require more than 1,000 h of testing before committing to them.

EMR has certainly changed our practice. It has increased revenue and increased number of patients seen (30 per day). It provides us with electronic reminders and prompts that improve safety. Refills via Surescripts are done with ease and with good safety assurance with suggestions, reminders, and prevention of duplication. The data aggregator has contributed tremendously in improving vaccination administration.

I cannot say it has not changed interactions with patients – it's another entity in the room. I approach it in this way: I show the computer to patients and don't use it as a shield. I use it to show them their information and as a way to involve them in their healthcare. Am I happy we now have EMR? Well, I would never go back. Patients like it, information is available easily, it is cutting-edge, and can show patients things about their health graphically in a way that just was not possible with paper charts. When a good system is implemented wisely and used actively with an eye toward improvement at all times, it improves our ability to do our jobs, to improve patients' health and the care they receive, at the bottom-line.

Interview:
Robert Clark, MD
Clark Family Medicine
Newland, NC

Dr. Robert Clark has been practicing family medicine with obstetrics since 2000. He earned his MD from University of Texas Health Science Center at San Antonio in 1997. He established Clark Family and Obstetric Care in Linville, NC after completing residency at Moses Cone Family Medicine Residency Program, where he served as Chief Resident in his final year. In 2006, he moved his practice, now known as Clark Family Medicine, to Newland, NC.
Dr. Clark has an extensive background in information technology preceding his training and career in medicine, which provided him with specific skills and knowledge to begin exploring the world of EMR prior to finishing his residency. He holds a BS in Computer Science earned from Appalachian State University in Boone, NC in 1986 and worked for Texas Instruments in Dallas, TX as a programmer/systems analyst from 1986 to 1991 as well as in Voice Control Systems in Addison, TX as software engineer from 1991 to 1992. Dr. Clark has had articles published in AMA News and the Family Practice Journal regarding the basic EMR he programmed for Moses Cone Family Medicine Residency.

Medicine is my second career. I received my BS in Computer Science from Appalachian State University and began my computer programming/systems analyst career at Texas Instruments in Dallas, TX. With a background in computers, I knew I wanted to have an EMR to make my office flow efficiently. After researching the vendors available in the late 1990s, I opted for e-MDs as the process of software development was the way I would have created a software company to produce an EMR. I used e-MDs as a PGY-3 to record all my outpatient encounters, so I would be ready when I started my own rural practice.

My wife received her MBA and worked in the information technology industry as well. She was a natural to be our business manager. We opted to scan the most current notes (usually about 1 year) along with the lab and test results into our EMR from old paper charts as new patients came to our practice. This made implementation a bit more challenging, but otherwise it went fairly smoothly. We had opened a brand new office and did not inherit paper charts – we started our practice from day one with an EMR. Of course, I created all my notes with e-MDs and added entries as new patients arrived. Labs and tests that I ordered still had to be scanned when we opened our family medicine practice in 2000. Our support staff took to the EMR well. All had experience in other offices with paper charts and quickly came to realize the benefits of an EMR. We ran our office of 25–30 patients daily with a total staff of four, including myself and my wife for about 2 years. I do not believe we could have done this without an EMR.

We started our search for an EMR when I was a PGY-2. After researching online, we determined it was best to see demos and meet the developmental and support staff directly. The largest gathering in 1998 was TEPR in Washington, DC. My wife and I attended and looked at several vendors. e-MDs struck both of us as the most intuitive and had great staff. They offered a free version for residents, which I used during my PGY-3 outpatient rotations. That solidified our choice.

Not being one to enjoy sales pitches, we already had the basic knowledge to select an EMR and felt astute at ignoring “vaporware” promises. That is, we knew

we wanted to choose a vendor who had a good business development plans and excellent technical/support staff with a system that worked from day one. Our selection of e-MDs was also based on it providing a fully integrated system, which included billing, scheduling, and charting. Our software experiences had revealed many of the problems with using software components from different vendors. You almost always got the response, "It must be the other guy's software" when problems arose. That can be extremely frustrating as the time demands of medicine do not allow you to tease the real answer out. Our experience was mostly self-generated and very satisfactory.

My expectations for EMR have their roots in my residency which was excellent but had paper charts like almost every other practice in the late 1990s. The frustration of lost charts, flipping through to find results, dictating then waiting several days for a paper copy, and the inconvenience of showing patients their information (e.g., no way to do flow sheets on lab data points easily) was something I wanted to avoid in a new practice. I knew my EMR would avoid almost all of that. I could bring up a patient's chart in the exam room, review trends in labs and test results, print out patient education handouts for specific problems, limit drug interactions through automated checking, and see charts on-call from home. I could limit the number of staff members and overhead by doing my own coding, avoiding space for paper charts, and streamlining patient flow along with their information.

The EMR largely met my expectations. Use of templates took some time to determine best use. Nothing is faster than dictating. However, there are no data points that can be used later for recurring visits. Thus, the initial effort of putting in the template information paid off on return visits. The difficulty is carving out the time needed to do this in a busy primary care office initially. It meant many late nights and missed time from family.

Not being so busy is about the only way I can see the transition to EMR being easier. However, the bills have to be paid and you want to be growing your practice. I believe my expectations were pretty much in line with the reality. Modifying templates to meet my own workflow ended up helping overall. However, I am not sure I would have known that without going through the day-to-day practice activities using the EMR. Maybe having contact with an experienced provider who had implemented the EMR could have been beneficial. However, in 2000 there were not many providers using my EMR.

In terms of advice for other physicians entering the EMR world, working with the software ahead of time is somehow tremendously beneficial. Working with software on a small subset of patients was very helpful as I used it on a much more limited basis as a PGY-3. Develop a team of front and back-office staff who understands the importance of EMRs. You will need frequent meetings to review problems as well as solutions.

The convenience of pulling up a patient's full chart from any location is one of the best aspects of an EMR. Whether I am in the office or at home responding to a page, I can find out the patient's history, what has been done through our office (including other provider's office notes and labs/tests), current medications/allergies, and can document the encounter immediately. I can send prescriptions from anywhere and

have eliminated all prescription pads. Additionally, the billing cycle is much cleaner and quicker as the invoice is built prior to patient checkout and our EMR "scrubs" our claims before being sent to the insurance company. This requires only part-time billing staff overhead.

Our labs are electronically placed in flow sheets for my review as well as sharing with the patient without manual intervention. I believe this has motivated patients with hard data to improve in some of their chronic conditions. Finally, patient registries are easy to develop from our database. When medication recalls occur, we run a report to determine who needs to be contacted. We can determine who is at goal for certain conditions on a practice-wide basis. When new medication interactions are found (e.g., Plavix and PPIs), it is easy to find out whom we need to contact to change medications.

One of our greatest challenges having an EMR includes not having electronic connections to specialists and hospitals and the time it takes to print our notes and fax. In addition, we have to redirect electronic faxes to the correct patient in our system when the patient is evaluated by a specialist or discharged from the hospital. On review, I have to update our lab flow sheets and health summary to ensure we do proper follow-up. An electronic data exchange, as is done in many industries, would help my care of patients and save us time and money.

Having EMR has changed our practice: it is much more efficient with higher quality of care and reimbursement than the paper chart environment that I experienced mostly during my residency. In terms of effect on physician–patient interaction, I was initially concerned that this would present some challenges and be burdensome. However, I found that the patients were quite impressed with the use of an EMR. They reported with more confidence in our practice. Sharing data from the EMR, including labs, tests, and patient education handouts, has increased our quality and helped to motivate patients to change for the good of their health. I have found no significant negatives.

If you ask am I happy with EMR? Absolutely! I cannot imagine practicing without our EMR.

Interview:
Dr. Jim King
Family Medicine, Primecare Medical Center
Henderson, Selmer, and Adamsville, TN

Dr. Jim Kingis a family medicine physician in Tennessee. He received his medical degree from the University of Tennessee College of Medicine in Memphis and completed his residency training in family medicine at the UT Family Medicine residency program in Jackson. In 1985, he completed his residency and moved to Selmer with his wife and three kids and joined his father's practice. That practice later became known as the Primecare Medical Center. Dr. King still works at Primecare and the staff now comprised seven family medicine physicians, one general internist, and three nurse practitioners. They have offices in Henderson, Selmer, and Adamsville, TN. The practice has about 20,000 active charts. In the past 25 years of

practicing medicine, Dr. King has held many leadership roles including President of West Tennessee Consolidated Medical Assembly, Tennessee Medical Association (TMA) and Tennessee Academy of Family Physicians (TAFP). Dr. King also has the distinction of being only the second family medicine physician from Tennessee to be the President of the American Academy of Family Physicians (AAFP).

We decided for transition to EMR after hearing all the information presented to us by AAFP and others in our community indicating that technology is changing and we have to move in that direction. One of our partners was interested in computers so that helped us as well. The entire process of selecting and incorporating EMR took about 6 months. We reviewed several systems to begin with and eliminated them based on two criteria: (1) we wanted a company that we were sure would be around for 10 years and (2) the accounting system and EMR had to be from the same system. (We didn't want one group telling us it was the other's problem. Like one group responsible for software and the other hardware.) The experience of selecting an EMR was not very painful but definitely complicated. There were so many variables and so many companies out there that you always felt like you were comparing apples to oranges.

I didn't have a ton of expectations going into it but I knew for sure that it would cost me more money than the system we already had in place and it would slow me down. On the positive end, I believed that it would provide me with better data. I anticipated that it would allow me to document better what I do, resulting in higher level of coding and better reimbursements. I was also hoping that it would give me reminders about things such as immunizations, screening tests, etc. In retrospect, EMR has met many of my expectations but not all, our expenses did go up and our productivity did go down. It took longer than expected to reach an acceptable productivity level, and even still I don't believe we will ever see as many patients in a day again. Prior to EMR, I would see an average of 35–40 patients a day, now I see 30–35. In my opinion, EMR will never make you more money but somewhere between 9 and 18 months you should at least be back to where you were. Of benefit, we are able to code higher because of system documentation.

It's funny how expectations and reality don't always line up. I really thought that I would just turn on the EMR and most of the features I wanted would appear and I would only need to use the ones available to me, but that was not the case. The vendors come out and sold us on their product but they really didn't take the time to determine what we needed. The most frustrating thing was that it seemed like everything we wanted, including but not limited to, e-prescribing, webpage interactions, disease registries, protocols, and flow sheets all had to be added separately and usually for an additional cost.

I am not sure if any of these misalignments of expectations and results could have been avoided, but I would have definitely talked with trainers and service people associated with each product rather than salesmen who may not have always had our best interests in mind.

As I expressed earlier, implementing a new system of any kind can be challenging for a practice, but the challenges can be minimized by adding something new

on a regular basis and having a plan on how you're going to implement in place prior to starting. I really don't think we could have done it better. Everyone was up and running in less than 2 weeks. We were moving slow but we were moving forward nonetheless. The largest challenge during this transition was getting all of my partners and staff to agree that EMR is inevitable and that we must all be on board in order for it to work. Once getting past the inertia everything moved better. My advice for physicians who are thinking about purchasing an EMR is to stop hesitating and take the next step, no matter what it may be for you.

In my experience thus far, the best aspects of now having an EMR is that my patients are getting better care. We are following preventive services better, their chronic conditions are managed better, and I can read my partners notes. EMR does have an effect on patient interactions both positive and negative. Because I spent more time looking down and typing, I had to work extremely hard to make sure it didn't appear that I was just a data entry person and not their doctor. But my patients seem to be very receptive and appreciative of EMR. They are impressed when I can look up the latest treatments right there in the room.

All in all I am very much pleased with our decision to implement EMR and I will never go back to paper charts.

Interview:
Keith Sweigard, MD
Internal Medicine Associates of Abington Abington Memorial Hospital
Abington, PA

Dr. Sweigard is the Chief, Division of Internal Medicine and Director of the AMH Physician Network at Abington Memorial Hospital. He has special expertise and research interests in medical informatics and has served as a liaison between the medical staff and the IT services at Abington since the early 1990s.

I have been involved with bringing information technology to Abington since the early 1990s, working as a liaison to the IT department while practicing internal medicine and attempting to bridge the worlds of medicine and IT and maintain those bridges through many transitions over the years.

The early experiences with this process were difficult. We had two failed attempts at trying for transition of our entire physician network to EMR. The first attempt was to use the EMR provided by the same vendor as our patient management system. There was significant performance issues, specifically challenging was the lack of a template design utility. The company had no experience with this. We moved to a web-based application which presented significant data integrity issues, specifically dates not carrying over. We attempted to select a more established EMR, one with a longer history and good track record and in this process physician involvement was increased many-fold as the importance of end-user input was clearly manifest by this point.

We chose the fastest growing vendor who already had systems established in many large settings. We conducted site visits, including a site in the New

York city, to see the system in action, to assess the workflow, and selected eClinicalWorks ultimately. Other factors that led to this selection included the availability and possibility of enhancements for the system. With an eye toward the future and pay-for-performance coming up, we wanted to be secure in improving our population management, our ability to trend, mine data, and use it for the betterment of our care of patients while meeting these new expectations of measures of service. eClinicalWorks as a vendor demonstrated its willingness to innovate for end users and this contributed significantly to our selection of the system.

In practical terms, workflow is one of the most critical parameters in the office setting and selection of an EMR and how it will facilitate or hinder workflow must be carefully considered. What adjustments need to be made once an EMR is implemented must be anticipated so that workflow will continue as smoothly and efficiently as possible. Staff comfort with the system is critical; it leads to better interaction with the patient and all things follow from that. We have had success with data entry, data review, and population management with this system. We still have some performance issues which can be difficult to tolerate in a high-paced office, but having a plan in place for addressing such issues and events is key to fruitful resolution of such events.

Increased dependence on a complex information management system, any technical system really, leads to a very real increased risk of single-point failure. This must be acknowledged, and safety measures and plans must be put in place and reviewed regularly in case of such events. Complex systems will fail. It is not a matter of if, but when. For these reasons, it is essential that all those who are involved keep engaged in day-to-day performance issues and that there may be redundancies built in the system. One must always keep in mind the possibility of larger events such as servers being down, in addition to day-to-day events.

Many clinicians are concerned about what implementation of technology will do to the human interaction that is at the core of the practice of medicine for the physician and the receipt of medical care by the patient. While protocol use is important in patient care and will help us keep better track of parameters measuring quality of care through patient tracking and assessment, some argue this will threaten the human aspect of this interaction. I argue that use of information systems could in fact, paradoxically, improve humanism in medicine. I am very excited, for example, about the future of “patient portals” which will facilitate a more “patient-centric” healthcare system. It will increase patient’s understanding and ability to self-manage by involving patients in their own care as partners with us. Being able to review clear med lists, track blood pressure reading, and view such measures on clearly plotted accurate graphs will likely open patients’ eyes and involve them in a new way through knowledge and ultimately understanding.

I find that patients are expecting more and more of the use of technology in their care. As a clinician, I try to engage patients with the computer in the room. I show it to them, view it with them side-by-side, looking at med lists, for example. It is not a barrier in my practice. I hope it will make us all better physicians through care reminders and extra support measures. We all need reminders as the world of

medicine and sheer volume of information grows even larger, more detailed, and complex.

Another significant issue very close to the patient is that of privacy. Our system currently has an open architecture. Safety and privacy can be at significant odds and can present significant challenges. Do we keep the open architecture and have an audit trail of who has seen the record, with the ability to discover and cite any individual who should not access the record under HIPAA as the policing factor, while allowing those with a need to know for patient care and safety the access they need? We can go too far in either extreme – protecting privacy to the point where it threatens appropriate care by being so cumbersome and presenting points of significant potential danger to the patient. Yet, we must preserve privacy as a fundamental principle of medical ethics. Patients must feel safe in the context of their receipt of healthcare and this sense of safety includes feeling that their privacy is preserved.

My advice for those in the process of considering or selecting an EMR is to look at large vendors with a great install base. The system needs to do all core things well: from e-prescribing to ease of documentation. Consider the big debate regarding template usage versus free texting. Templates work well for diseases, but not for the illness the patient experiences. It is therefore essential to have both capabilities. Structured data including past medical history, medications, and allergies work well. But one must always have the ability to quote a patient regarding his or her own illness experience. You should be able to access results with reasonable ease. This should offset your data entry burden.

EMR is the clear path to the future for all of us in medicine. To the pay-for-performance and quality of care measures, we all will be held to for the betterment of our patients' well-being. Look for a system that provides population management options with a usable tool, easy messaging ability and plans, at least, for patient portals in place. If you don't have good typing skills, acquire them STAT. I would strongly advise anyone not to rely on voice recognition systems; they are far from perfects and because of this they present some significant challenges, words not intended, miscommunications in addition to very clear privacy issues when a clinician is openly verbalizing patient encounters.

In transition, you should make plans for chart storage. I recommend starting to scan paper charts on the first day of EMR implementation. The office schedule must be cut; otherwise the risk of errors is significant. Teamwork is an absolute must. All members of the office staff and clinical care staff must work as a team with the in-house technological support staff. A well-thought out plans must be in place for the human aspect of going through this transition, i.e., for handling and limiting the stress that will incur, for improving communication. Office huddles, frequent debriefing sessions are essential for addressing issues as they unfold, including and hearing all individuals involved. Special attention must be paid to preserving roles and observing the needs for modifications of roles.

Preparation for the handling of patient flow, phone calls, and refills once EMR has gone live must be done at least 2 months in advance. One month prior to going live there should be an opportunity for everyone who will be using the system to

play with the software, to use it, and become familiar with it prior to using it at the point of care. At the time of going live, there should be lots of support from information support services. Patients should be informed about the transition. Be proactive at every step. Build an esprit de corps. While this will not be a panacea, it can be a positive experience for everyone. Keeping in mind, always, the ultimate goal is improved care for our patients.

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