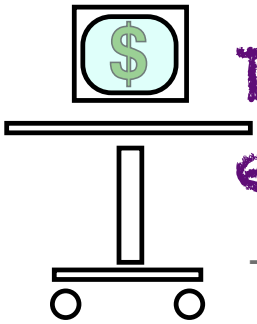

Dollars and sense of electronic medical records

The impact of EMR on billing, coding, and physician reimbursement

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A national shortage of primary care physicians is mounting, with an estimated need for an additional 45,000 doctors by 2020. Nowhere is this dearth felt more severely than in rural areas of the country.[1] While senior medical students undoubtedly take many factors into account when picking a field for further training, the two disincentives to a career in primary care most often quoted by the media are lower income relative to more lucrative specialties and a crushing burden of paperwork. These factors have resulted in a drop in the percentage of graduating senior medical students going into primary care specialties—from fifty percent in 1998 to thirty-eight percent in 2006.[2] Electronic medical record systems (EMR) may help alleviate these unsatisfactory attributes of a career in primary care, offering the potential benefits of improved quality of patient care, more consistent documentation, more efficient clinic management, and improved physician remuneration. However, there are many barriers to the successful implementation of EMR, the most important of which is cost. The balance of risk and benefit is most important for small private primary care practices, whose financial stability may be more uncertain. As of 2004/2005, only eleven to fifteen percent of private primary care practices had implemented EMR.[3,4]

In a pair of May 2010 articles in the *Canadian Medical Association Journal* (CMAJ), author Paul Christopher Webster noted that without EMR, as much as thirty percent of patient care time is spent in a "paper chase."[5–6] Better known to medical students as "scut work," these tasks include tracking down laboratory results, radiology reports, and consultant's letters, as well as documenting clinical visits, writing prescriptions, making referrals, and ordering labs and imaging. As patients age and comorbidities accumulate, diagnostic and follow-up tests clog their medical records, causing chart size and physical space requirements to skyrocket.[7] Furthermore, multiple staff members frequently need to access a patient's chart simultaneously: nursing staff to chart the chief complaint and vitals, physician staff to document the visit and management plan, and secretarial staff to schedule follow-up tests, consults, and submit the visit for insurance reimbursement. As highlighted in the CMAJ articles, effective EMR reduces this astronomically frustrating paper chase, allowing physicians to function more efficiently and perform the duties they were trained for.[5–6]

Studies in the literature

A four-physician practice in rural upstate New York published a qualitative paper in 2007 describing its experience using EMR. Following the progressive implementation of a commercially available EMR system over one year, the practice saw an upswing in efficiency, evidenced by shorter turnaround times for prescription refill orders and school and work letters, improved internal communication, and fewer medication errors and calls from the pharmacy. Physician quality of life was improved by the installation of a virtual private network (VPN) that allowed physicians to access patient data and field after-hours calls from home, and allowed greater latitude in scheduling.[3] The observations from this practice were echoed in a publication from the outpatient clinic at Cincinnati Children's Hospital. Following the installation of EMR, the delay in medication refill turnaround was cut from two days to just twelve hours, and the time to generate school notes was halved. The number of paper chart pulls was reduced, allowing staff to perform their duties more efficiently. At the same time, the switch from paper to electronic records freed up space for the creation of two additional exam rooms.[7]

Several studies have cited an improvement in patient safety and quality of care with EMRs.[4,8] In part this is due to fewer medication errors from misreading prescriptions.[8] Additionally, a customizable EMR interface makes grouping disease-specific signs and symptoms possible, leading to more consistent and thorough questioning and examination


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by physicians,[8] which further allows for improved disease surveillance and adherence with guidelines and medication regimens.[3,4,8] Patients are also spending less of their time in the doctor's office, with a drop of 5.4 percent seen in one study.[4] Finally, another study shows an increase in the percentage of charts containing a problem list from twenty-nine percent to eighty-four percent over two years.[7]

Every benefit, however, has its price, and when it comes to EMR systems, the sticker shock can be staggering. In a study published in 2007, five offices with twenty-eight physicians at the University of Rochester Medical Center performed a staged implementation of an EMR system at a total capital cost of nearly $485,000, with an additional $25,000 in first-year expenses (about $18,000 per provider). Annual costs for years two and beyond averaged $114,000 (about $4,000 per provider).[4] The initial costs were recaptured within sixteen months, with ongoing annual savings of nearly $10,000 per provider. However, for many practices, particularly smaller groups, implementing EMR may be a serious gamble, as the large expense is divided among fewer physicians. Moreover, with the exception of this study, data on return from this investment is largely anecdotal.[4] For practices with deep pockets, fully-customized EMR systems can be linked to a practice's existing billing and scheduling systems, perform complex tasks, and be custom designed to fit client requirements.[3,8] But for more cash-strapped groups, off-the-shelf systems can be significantly cheaper.

To cover this expense, along with the other costs of running a practice, a doctor's office has to get paid. Reimbursement by insurance providers is based on a process known as coding. For a given situation (i.e., new patient evaluation, established patient visit, hospitalized patient, etc.), the level of complexity and scope of the history and physical determines the rate at which the encounter can be billed. For the sake of this discussion, we will use an established patient visit, where the current procedural terminology (CPT) codes vary from 99212 to 99215. The amount of history taken varies from a problem focused history (99212) to a comprehensive history (99215). The physical exam is stratified in a similar fashion. The third component of coding is what is referred to as "medical decision making," which is classified as straightforward, or low, moderate, or high complexity. Based on how the history, physical exam, and medical decision making qualify, a code is assigned, and a given amount of money is paid. The table following is a highly simplified overview of the process of coding. Physicians can also bill for ancillary services, which include reviewing labs and imaging, discussing a case with a colleague, and so forth.

The table illustrates that the process of coding is tedious and time consuming. Physicians and staff members without a solid working knowledge might easily undercode a visit (i.e., label what should be a 99214 as only a 99213) or neglect to bill for services for which they do not know the code, resulting in lower remuneration. A major benefit of EMR systems is that they store such information and reference it automatically. A ten percent drop in undercoding was seen in the study from rural New York, along with an increase in billing for ancillary services, resulting in an eleven percent increase in annual revenue in the first year after EMR installation, and twenty percent increase in the second year.[3] A significant decrease in 99211 and 99213 codes was seen in the study from the surgical practice discussed earlier, with a corresponding increase in 99214 and 99215 codes. This change netted the practice nearly $10 more per visit compared to their pre-EMR days. An increase in charge per visit of up to

Overview of the Process of Coding

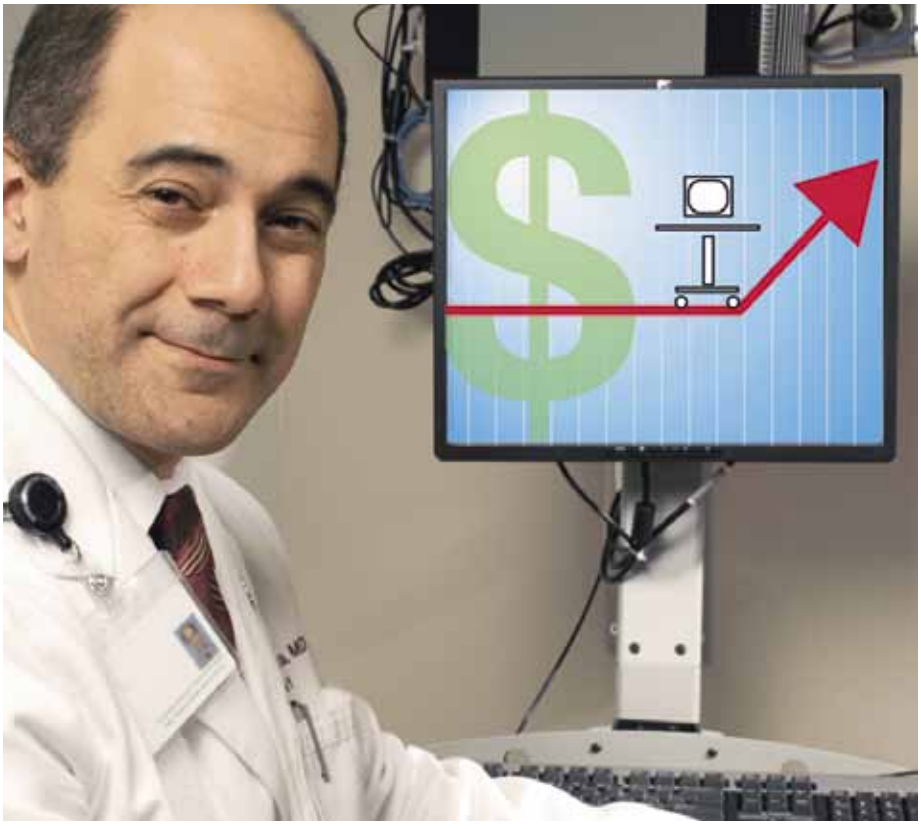
CPT Code	History	Physical Exam	Medical Decision Making (MDM)
99212	Problem focused history • Chief complaint (CC) • Brief HPI (1 to 3 descriptors*)	Problem focused exam • Limited to affected area/system	Straightforward MDM • Minimal diagnostic/treatment options • Minimal amount/complexity of data • Minimal risk of complications
99213	Expanded problem focused history • CC and HPI as above • Problem-pertinent review of systems (ROS)	Expanded problem focused exam • Affected area/system • Related systems (2 to 7)	Low complexity MDM • Limited diagnostic/treatment options • Limited amount/complexity of data • Low risk of complications/mortality
99214	Detailed history • CC • Extended HPI (4+ descriptors) • Extended ROS (2 to 9 systems) • Pertinent past medical, surgical, family, or social history (PMH, PSH, FH, SH)	Detailed exam • Extended exam of affected area/systems • Exam of other symptomatic or related areas/systems (2 to 7)	Moderate complexity MDM • Multiple diagnostic/treatment options • Moderate amount/complexity of data • Moderate risk of complications/mortality

This table uses an established patient as the example.
*Onset, location, quality, radiation, improving factors, exacerbating factors, severity, etc.
Note: For each CPT level, two out of three key components (History, Physical, MDM) must be satisfied for that coding level.

$26 has been reported in other studies.[4]

The paper from Cincinnati Children's Hospital above and a study from the Medical University of South Carolina (MUSC) both identified an improvement in chart completion rates, allowing for increased billing and reimbursement, as many insurance providers require visits to be submitted with completed documentation within thirty days.[7–8] In the MUSC study, completeness at seven days after the visit bumped from 75.3 percent to 78.7 percent, and at thirty days from 94 percent to 98.4 percent. At thirty days, this 4.4 percent increase in completed charts is equivalent to 4.4 percent more billable visits. With approximately 29,550 patient visits per year, this is roughly 1,300 more billable visits. Billable visits at this clinic average $72, and so this seemingly insignificant 4.4 percent increase in completeness results in an additional $93,600 annually.[8] These findings mirror those seen in the rural New York practice described above, where an increase in revenue was due in part to a drop in the number of claims rejected due to incomplete charting or submission beyond insurer deadlines.[3] Moreover, one study documents a decrease in the time from the initial visit to reimbursement of five days.[4]

Clearly, EMRs allow practices to capture revenue that may otherwise slip through the cracks. But EMRs also allow doctors offices to cut costs by removing paper charts from the equation, thus eliminating the materials costs associated with assembling new paper charts. In the study from the University of Rochester described above, 4,288 new charts costing $6.50 each were created annually before implementing EMR. The elimination of the charts saved the practice nearly $28,000 a year in materials,[4] as well as reducing the amount of time staff members spent gathering charts. By six months after EMR implementation, there was a 79 percent decrease in the need to track down paper charts, with a 96 percent decrease at two years. Based on the amount of time to pull one chart, the number of charts pulled annually, and the cumulative pay for the man-hours required, the authors estimated an annual savings of $250,000. There was also approximately $25,000 saved based on reduced filing time for placing documents into charts. In offices previously using transcription services, approximately $30,000 was saved annually.[4] Finally, office workflow was made so efficient by EMRs that two full-time positions were eliminated despite an additional six physicians added to the practice, saving the group approximately $90,000 annually.[4] The annual savings in this practice (excluding transcription service, which was used sporadically) thus



About Charles Rutter

I grew up in Ellicott City, Maryland, with my wonderful parents, Eugene and Mary, and my siblings, Cailin and Sean. My undergraduate education was at the University of Maryland, Baltimore County, where I majored in biology and met my beautiful wife Victoria. I then attended the University of Maryland School of Medicine, graduating in May 2011. I will spend my medicine intern year at St. Mary's Hospital in Waterbury, Connecticut, before heading to Yale-New Haven Hospital for a residency in Radiation Oncology. I thank Drs. Bui and Saxena of Hagerstown Family Medicine for their insight into the business of running a small private practice, my inspiration for writing this article.

total $393,000. This allowed the practice to break even with the initial costs of the EMR in sixteen months, and to save approximately $10,000 annually thereafter.[4] While this experience will not be representative of all practices, it certainly demonstrates that the large up-front costs of an EMR can be recaptured completely and quickly, and implementing it can allow significant savings thereafter.

One case study

Hagerstown Family Medicine is a small practice in western Maryland consisting of three physicians, two nurses, two medical assistants, and three administrative assistants. Prior to installing a commercially available EMR system several years ago, the practice used a combination of paper charts housed in the clinic and a warehouse, as well as a DOS-based records system. During the transition from old to new, forty to sixty hours of on-site training was supplied by the vendor, and implementation was performed all at once. The new system ties together nine computers, a printer, and over one thousand gigabytes of files via an office intranet. The practice utilizes an off-the-shelf EMR that includes billing and scheduling applications and fits its needs well while still remaining affordable.

Hagerstown Family Medicine invested approximately $70,000 up front for the EMR system, with annual license and support fees totaling about $20,000 (roughly $23,000 and $6,700 per provider, respectively). Following installation of the EMR system, the practice discontinued its transcription services, saving $24,000 to $30,000 annually ($8,000 to $10,000 per provider). The time requirement related to record keeping and finances decreased markedly, such that one staff position was no longer necessary, allowing additional savings. However, no changes were observed in the percentage of charges generating revenue, the percentage of claims rejected due to missing submission deadlines, coding trends, or time to reimbursement. The absence of these outcomes is explained, at least in part, by the fact that one of the practice physicians is a certified professional coder. The patient volume did not change following EMR installation. Notably, while overall revenue did not change with implementation of the EMR system, annual savings top $20,000, which allowed the practice to break even with its initial investment within two and a half years.

The most notable improvements experienced by Hagerstown Family Medicine are in the areas of practice efficiency and physician lifestyle. Adjustment to the new system was fast and very easy, allowing the providers to see fifteen patients in the first day following EMR installation. One of the major gains noted by the physicians is the ability to complete all documentation while in the room with the patient, shortening the working day. Writing prescriptions and refills is fast and easy because the EMR is capable of Internet faxing prescriptions to most local pharmacies. Lab tests are automatically uploaded within twenty-four hours of their release, allowing efficient review of results at patient visits. Doctor's notes for work and school can be created using predesigned templates. Charts are easily accessed both in-office and from home using the office's VPN, allowing easy coverage of after-hours calls from home. The VPN also allows administrative duties to be performed from home. These changes in data access have allowed a significant improvement in lifestyle and more time away from the office, while maintaining the quality of patient care.

In her 2006 article in the *New England Journal of Medicine*, Dr. Beverly Woo candidly discusses the good and bad of being a primary care physician—and the challenges facing the field. The highlights of her career, it seems, are the long-term relationships she has with patients and their families, the intellectual challenges posed by having to diagnose any one of a myriad of diseases and conditions presenting with such protean symptoms as fatigue and abdominal pain, and the opportunity to improve her patients' health by understanding and working within the confines of their sometimes-complicated social situations. However, she too is clearly distraught by the pressure placed on primary care physicians to see more patients in less time, the insufficient remuneration for her efforts, and the Everest-sized piles of paperwork that she and her colleagues slog through daily.[2] While EMR systems may not be the panacea for all that ails primary care medicine in the United States, their many benefits may be the shot in the arm that the field so desperately needs.

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