

dening busy frontline health care providers. Other members of a medical home team could efficiently follow up many of the alerts we encountered. Alert systems could also allow the sender to highlight relevant text within the note. Because clinician-to-clinician messaging is likely to increase as systems become more integrated, our study might be useful to others as they explore interventions to improve outpatient communication.

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## INVITED COMMENTARY

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### Electronic Medical Records and Preserving Primary Care Physicians' Time

We both hear strong complaints from primary care physicians (PCPs) about electronic medical records (EMRs) cutting their time efficiency. A long and detailed venting occurred 4 years ago when we were together at a social gathering and M.H.M. was bragging about his brother's (C.J.M.'s) involvement in the genesis of EMRs.<sup>1,2</sup> Two general internists—both women—did not agree that such involvement was praiseworthy. “Think Oppenheimer and the atomic bomb,” one said wryly, “the EMR steals sixty minutes a day from me!” The other had a 6-month-old baby and said, “He is sleeping by the time I get home,” and tears welled. There were positives. They loved its instant delivery of patient data. Computer order and prescription writing were probably okay. But note writing was a definite drag compared with paper, though they liked producing legible notes that were computer available. What vexed them the most was the EMR inbox. Compared with the paper version, it seemed to increase the number of work items, inflate the time to process each, and divert work previously done by office staff to them.

Murphy and colleagues<sup>3</sup> provide the smoking gun for the internists' complaints of time theft. In this issue of *Archives*, these authors report that nearly half of one kind of inbox message was unimportant and 80% of the message text within these messages was irrelevant. In a previous study they described the spectrum of inbox messages—including study reports, confirmation of consult requests and the return of consult reports, refill requests, signature requests, and so on. Patient e-mail was not mentioned as part of this content. They also reported that processing these messages consumed on average a whopping 49 minutes of PCP time per day.<sup>4</sup>

To get a current estimate of the effect that EMRs have on health care providers' free time and the relative effect

**Table. Responses by Primary Care Physicians to the Survey About Electronic Medical Records (EMRs)<sup>a</sup>**

Question	Response (No. Who Responded)	Median Response (95% CI)	Mean Response	Measure
How do you enter notes?	Dictation (1) Typing (5) Templates (3)	NA	NA	NA
Effect of computer on home free time (FT)	Much more FT (1) No effect (1) Somewhat less FT (4) Much less FT (3)	4.0 (2.5 to 5.0)	3.9	5-Point Likert scale: 1 = Much more; 5 = Much less
If it reduces/increases free time, how many min/d <sup>b</sup>	Reduces by -90 min (3) Reduces by -60 min (4) Reduces by -45 min (1) No effect, 0 min (1) Increases +30 min (1)	-60 (-75 to -15)	-48.3	Minutes
EMR compared with paper for patient data access	Greatly faster (5) Somewhat faster (4)	1.0 (1.0 to 2.0)	1.4	5-Point Likert scale: 1 = Greatly faster; 5 = Greatly slower
EMR compared with paper for writing prescriptions	Greatly faster (5) Somewhat faster (3) Somewhat slower (1)	1.0 (1.0 to 2.5)	1.7	5-Point Likert scale: 1 = Greatly faster; 5 = Greatly slower
EMR compared with paper for ordering and scheduling tests	Greatly faster (2) Somewhat faster (3) No effect (1) Somewhat slower (2) Greatly slower (1)	2.0 (1.5 to 4.0)	2.7	5-Point Likert scale: 1 = Greatly faster; 5 = Greatly slower
EMR compared with paper for writing notes	Greatly faster (2) Somewhat faster (3) Somewhat slower (2) Greatly slower (2)	2.0 (1.5 to 4.0)	2.8	5-Point Likert scale: 1 = Greatly faster; 5 = Greatly slower
EMR compared with paper for signing papers, managing calls/messages/refills, etc	Greatly faster (2) Somewhat faster (1) Somewhat slower (2) Greatly slower (4)	4.0 (2.5 to 5.0)	3.6	5-Point Likert scale: 1 = Greatly faster; 5 = Greatly slower

Abbreviations: FT, free time; NA, not applicable

<sup>a</sup>The survey was completed by 7 attending physicians and 2 residents. Questions have been abbreviated and 3 questions were excluded to minimize space. Interested parties can contact the corresponding author to obtain a full copy of the survey instrument. 95% CIs for median values were based on Wilcoxon rank sums with continuity correction. All statistical analyses were performed with R software.<sup>5</sup>

<sup>b</sup>One question asked for the amount of free time decreased and another asked for the amount increased. Respondents answered one or the other. We combined answers for analysis.

of different EMR functions, M.H.M. organized a pilot survey (exempted from human subject review by the University of Wisconsin and the National Institutes of Health human subjects offices) of 7 attending physicians and 2 residents from a nearby family practice clinic. Only health care providers who had experience with paper records and used their current EMR for at least 2 years were eligible. The survey was distributed on 1 day in November 2011 with no refusals. The questions and physician responses are given in the **Table**.

Seven respondents were woman and 2 were men. The survey results parallel the estimates the 2 general internists gave 4 years ago. No respondent reported that the EMR changed his or her average patient load (mean of 18 patients per day). The 9 PCPs reported a median of 60 min/d and a mean of 48 min/d of free time lost to the computer—numbers curiously similar to those in the study by Murphy et al.<sup>4</sup> Most respondents included written critical comments. Some examples include the following:

“Too much info. Too many clicks.”  
“Sometimes I can’t order something.”  
“I feel like I can’t escape work. It follows me home.”

Electronic medical record access to patient data was faster than with the paper system (no surprise). The same

was true for prescription writing. Physicians had mixed opinions about the effect of EMRs on the time to write orders and notes. Their opinions were more consistently negative about the EMR’s effect on message management—such as provided by the EMR inbox.

The 95% confidence intervals suggest that EMR systems consume enough extra PCP time to eat significantly into their free time, though prescription writing saves time. We suspect that PCPs in at least some other venues have the same problem because we hear these complaints from many quarters and almost all published studies report the same negative effect of EMRs on physician time.<sup>6</sup> One meticulous study reported no per-patient PCP time penalty based on a time motion study limited to clinic hours but reported a marked increase in total documentation time and a large overflow of documentation work to after-clinic hours based on physician surveys.<sup>7</sup> Our sample size does not let us identify the specific EMR function that explains this loss, but note writing and EMR inbox tending are our prime suspects.

Primary care physicians are already an endangered species. Fewer than 2% of medical students now plan to enter general internal medicine.<sup>8</sup> Institutions and policy makers should act to reduce the EMR time penalties on PCPs to increase the field’s attractiveness. Some suggestions in-

clude the following: eliminate mandates for direct physician note entry; provide alternatives, such as dictation, document scanning,<sup>9</sup> and/or scribes<sup>10</sup> for EMR note capture; make the EMR inbox smarter about when, and how, to present messages to PCPs; and train clinic support personnel to manage the same proportion of inbox messages they handled with paper systems and to think whether a message is important or just noise before pushing the so-convenient "Forward-to-PCP" button. If changes are not made to reduce or eliminate these time penalties on PCPs, there will be no PCPs left to penalize.

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**Additional Information:** Parties interested in obtaining the full survey instrument should contact the corresponding author.

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## RESEARCH LETTERS

### ONLINE FIRST

#### Young-Onset Colorectal Cancer: Is It Time to Pay Attention?

The 2010 *Annual Report to the Nation on Cancer* celebrated a steady decline in the incidence of colorectal cancer (CRC).<sup>1</sup> This progress has been largely attributed to CRC screening, recommended for adults 50 years or older since 1996.<sup>2</sup> In sharp contrast to overall trends, the incidence of CRC appears to be increasing among adults younger than 50 years,<sup>1,3</sup> a group for whom average-risk screening is not routine. Particularly concerning is a trend toward advanced-stage CRCs,<sup>1,3</sup> suggesting a potential role for increased clinical vigilance and more prompt evaluation of symptomatic patients. To raise clinical awareness and facilitate recognition, we undertook a cohort study to (1) examine incidence trends; (2) define the distinct clinicopathologic manifestations of young-onset CRC; and (3) identify risk factors for advanced-stage disease.

**Methods.** We used the National Cancer Database (NCDB), a hospital-based cancer registry sponsored by the American College of Surgeons and American Cancer society that captures 70% of all incident cancers annually.<sup>4</sup> We identified patients diagnosed as having invasive adenocarcinoma (behavior code 3 [malignant]; histology codes 8010, 8020-8022, 8140-8144, 8210-8211, 8260-8263, 8470-8473, 8480-8481, and 8490) of the colon and the rectum between January 1998 and December 2007, the most recent decade after the US Preventive Services Task Force (USPSTF) recommended CRC screening. Eligible patients (n=588 869) were stratified by tumor site (colon [site codes C180, 182-189, and 199] vs rectum [site code C209]) and by age at diagnosis (young onset [before age 50 years] vs later onset [at age 50 years or older]). Age-adjusted incidence rates (per 100 000 individuals) were calculated using the 2000 US standard population (SEER\*Stat software, version 7.0.4; National Cancer Institute). The temporal trend in the annual percentage change (APC) was identified (Joinpoint Regression Program, version 3.5.1; National Cancer Institute). For a subgroup (n=34 781) of young-onset CRCs diagnosed between 2003 and 2007—the following years after the USPSTF strengthened its screening recommendation in 2002<sup>5</sup>—independent predictors of advanced-stage disease (stages III and IV, nodal and distant metastatic disease) were identified by multiple logistic regression. This study was granted exemption status by The University of Texas MD Anderson Cancer Center institutional review board.

**Results.** We identified 64 068 young-onset (10.9%) and 524 801 later-onset (89.1%) CRCs. Age-adjusted incidence declined for later-onset CRCs after 2001 (APC, -2.5%; 95% CI, -3.0% to -2.0%) but has consistently increased since 2001 for young-onset disease (APC, 2.1%; 95% CI, 1.1% to 3.1%). The increase was greater for