

PHYSICIAN USE OF IT: RESULTS FROM THE DELOITTE RESEARCH SURVEY

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ABSTRACT

The authors analyzed 1,200 physician responses to a Deloitte Research/Fulcrum Analytics survey of office-based physician use of the Internet and other information technology (IT). Overall, the results suggest that 40 to 50 percent of all respondents are using, or are ready to use, IT for substantial clinical care. However, time and liability concerns about patient e-mail were pervasive across all IT user categories. The results also indicate that some public/private policies aimed at increasing physician IT use for clinical management should be tailored to specific segments of the physician IT user spectrum, rather than using a “one-size-fits-all” policy approach.

KEYWORDS

Physician IT use

Internet

PDA's

*Electronic medical record
(EMR)*

Clinical management

*E-mail between patients and
providers*

Patient, employer, and payer pressure on physician practices to adopt more information technology (IT) at the point of patient care is increasing. Recent Institute of Medicine reports suggest that nothing short of using electronic medical records (EMRs) can enable providers to achieve an acceptable level of patient safety and quality of care.^{1,2}

Understanding recent and expected physician use of IT, and physician attitudes toward use of IT, can provide

insights into the potential pace of physician adoption of IT that can substantially improve patient safety and quality of care. The diffusion of innovation literature, which has emphasized differences in types of innovation adopters,³ suggests that understanding differences in types of physician IT users can provide managers, IT vendors, and private/public policymakers with additional insights. This heterogeneity of physician IT users has implications for the likely pace of IT implementation, the pace of efficiency and quality gains that can be reaped from new IT, and policies required to increase that pace.

In this article, we use Fall 2001 survey data from 1,200 mostly solo/small group specialist physicians to provide an overview of physician use of IT, and to illustrate types of physician IT users, based on their recent and expected use of IT. In our view, policies aimed at increasing IT adoption can be effective only if designed to take into account this spectrum of physician IT use and attitudes.

Data and Methods

Survey Instrument. Data on physician IT use and attitudes came from telephone interviews conducted by Fulcrum Analytics (formerly Cyber Dialogue) and Deloitte Research in October-November 2001 with a national stratified random sample of 1,200 practicing physicians.

Fulcrum Analytics' 25-minute telephone survey instrument consisted of 72 closed-ended questions. Physicians were asked questions about personal work and non-work use of selected IT (e.g., using the Internet for e-mail) and about use of IT by other physicians and staff in their practice (e.g., electronic data exchange with third-party payers). In this article, we focus on interviewees' use of IT for work purposes, as physicians are most knowledgeable about that.

Further, we provide substantial detail on methods because commercial (as opposed to academic) surveys on physician IT use tend to get extensive media publicity, and yet the details of methods are often ignored. This is a problem because the publicized commercial surveys have limitations that should be understood in order to interpret them properly.

Study Sample. Prior to conducting telephone interviews, Fulcrum Analytics established a quota of obtaining 267 physicians for primary care (family medicine, general practice, internal medicine, and pediatrics), separate quotas of 50 to 75 physicians for each of 11 specialty categories (allergy, cardiology, endocrinology, hematology, nephrology, neurology, medical oncology, radiation oncology, psychiatry, rheumatology, and urology), and another quota of 278 physicians for other types of specialists.

These sampling quotas were motivated partly by the desire to obtain information from physicians who were relatively heavy prescribers. As a result of quotas, the sample was weighted towards specialists (77.8 percent of the total). The overweighting of specialists and exclusion of HMO staff and group model physicians contributed to the high proportion of solo/small group physicians (89 percent of the sample). Even in California, a state with a relatively sizable number of large groups, more than 60 percent of primary care physicians and 75 percent of specialists are in practices of 10 physicians or less.⁴

Fulcrum Analytics used a sampling frame developed by American Medical Information (AMI), which culls physician data from 5,000 Yellow Page and

Business White Page Directories, and from other sources such as professional directories. As of October 2001, AMI had 575,000 active, non-federal physicians in its database.

Eligible physician respondents had to be board-certified (or eligible), and see patients regularly. An attempt was made to contact each physician by telephone at least two or three times before drawing another physician telephone number from the sampling frame. Physicians were offered \$40, \$60, or \$80 to participate, the amount varying by specialty.

Fulcrum Analytics dialed 30,909 unique physician telephone numbers, left a message or contacted someone in the clinic in 23,492 cases (our denominator for the study), made contact with 2,759 physicians, and completed 1,200 interviews. Eliminating an estimate of physicians who were ineligible for the study, the response rate was 5.7 percent – quite low by academic standards,^{5,6} but apparently not dissimilar from other non-academic surveys, which often do not report response rate data, and in some cases do not release it upon request.

Nevertheless, some non-academic surveys receive wide media publicity. Even the recent American Medical Association "Study on Physician Use of the World Wide Web" achieved a 12 percent response rate,⁷ while another recent survey of physicians, practice managers, and executives on clinician use of IT achieved a 9 percent response rate,⁸ despite being sponsored by HIMSS and endorsed by four professional associations.

We believe that valuable information

can be obtained from this commercial survey of physicians, given the large number of respondents (1,200) that had a wide range of demographic characteristics, specialties, and views. Moreover, respondents were not predominantly young (and presumably more likely to use IT) – rather, mean age was 50.4 years.

However, some response bias is inevitable. A low response rate biases the sample toward physicians who use more IT and/or have more favorable attitudes toward IT. Such physicians are more likely to respond to a survey on IT use, thus somewhat over-estimating recent and anticipated physician IT use. The study should be seen as showing orders of magnitude of physician IT use, rather than precise point estimates.

Figure 1 provides data on the variables that we used to create the physician IT user categories, as well as basic demographic variables. Some 87.7 percent of respondents had used the Internet for a work purpose in the previous year, 26.2 percent used PDAs for work, and 12.9 percent were in practices using EMRs. For attitudes about the future, 66.8 percent agreed/strongly agreed that they would rely more on the Internet within five years. When we used other expected-use variables to categorize respondents, the pattern of differences among physician IT user types remained. Note that for most specific statistics reported on in this paper, missing data was relatively minor (less than 5 percent in most cases).

We based our general approach in

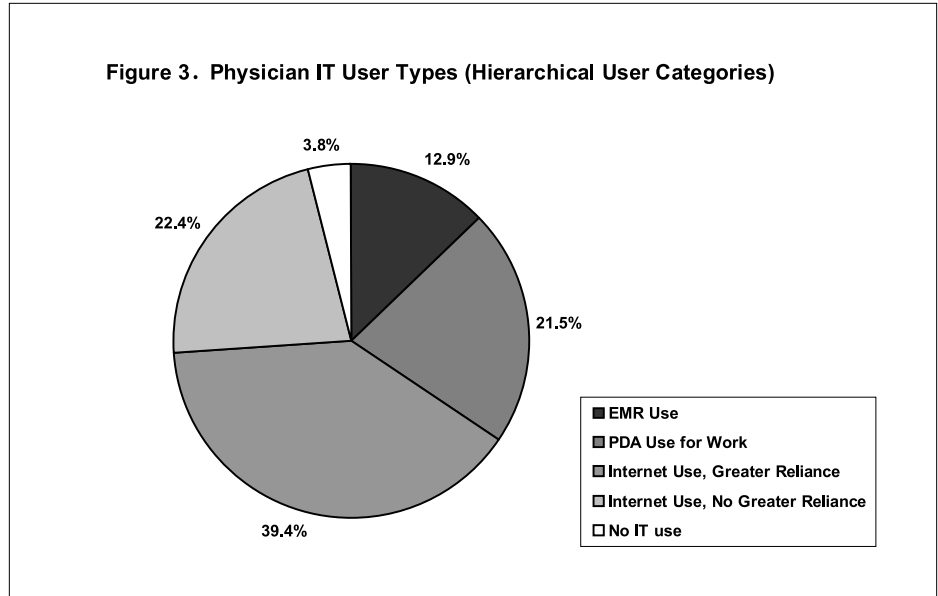
Figure 1. Variables Used to Create IT User Categories, and Basic Demographics

Variable	Percent	Frequency
Used the Internet for work in past year	87.7	1,052
Used a PDA for work	26.2	314
Practice had an EMR	12.9	155
Expects to rely more on the Internet within 5 years (% who agree/strongly agree)	66.8	802
Average age	50.4	1,193
Male	83.2	998
Primary care physician	22.3	267
Specialist	77.8	933
Solo practice	51.1	613
Median practice size	1.0	1,119
Mean practice size	11.0	1,119

part on the work of Rogers on diffusion of innovation, who identified five categories of innovation adopters – innovators, early adopters, early majority, late majority, and laggards.³ After examining different ways to categorize physicians, we too identified five categories of IT adopters: Three were based solely on their current IT use for professional or work-related purposes, and two others were based also on expected IT use. Our goal was to illustrate the usefulness of categorizing physicians as being at different stages of readiness for use of more sophisticated IT; we recognize that other categorizations are possible.

We created a hierarchical set of physician IT user types, based on their EMR use, PDA use for work, and Internet use for work (see figure 2). Thus EMR users constituted the most advanced category (regardless of their use of a PDA and the Internet for work) and were identified first; the remaining PDA users constituted the next most advanced category (regardless of their use of the Internet), and so on. The least advanced type were respondents who did not use the Internet or a PDA for work, or an EMR.

For the large group that used the Internet but not other IT, we created two categories based on whether they expected greater reliance on the Internet for work in five years. Again, we found that several other questions about future use of IT produced similar results. While it could be argued that the conceptual distance between each of these categories is not uniform, we



believe they represent a starting point for a reasonable typology of current IT users among practicing physicians in the United States.

Statistical Methods. Methods included use of Pearson’s chi-square and Kruskal-Wallis tests. We used ordered logistic regression to analyze the effect of demographic factors (e.g., age, gender) and practice characteristics (e.g., practice size) on the likelihood of being in a more advanced physician IT user type category.

Results

Physician IT User Types. Figure 3 shows the relative size of each type of IT user. The “EMR” user type category, containing the most IT-advanced users, included 12.9 percent of respondents

who stated that their practice used an electronic medical record (EMR). Based on other work conducted by one of us (Miller), some respondents very likely equated use of “EMRs” with their use of Microsoft Word or Access forms that they themselves developed for electronic documentation, rather than use of a commercial EMR system that provides integrated electronic viewing, documenting, ordering, and messaging functionality. Combined with some likely response bias toward physicians using more IT, the 12.9 percent overestimates EMR use, but still does group together respondents that are among the most advanced in IT use.

None of the respondents in the four remaining categories used an EMR. The “PDA Work” user type category included

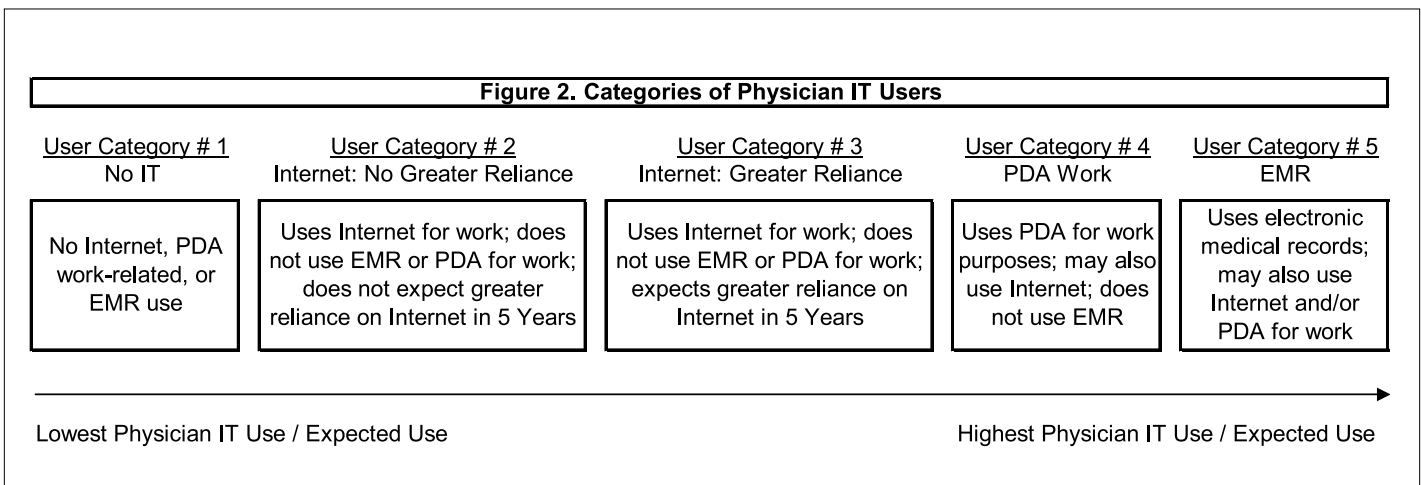


Figure 4. Characteristics of Survey Respondents by Physician IT User Type

	No IT	Internet - No Greater Reliance	Internet - Greater Reliance	PDA Work	EMR
Mean Age (years) *	59.1	52	50.1	48.0	49.2
Mean Practice Size (MDs) *	2.6	4.9	7.2	8.8	44.1
Median Practice Size (MDs)	1.0	1.0	1.0	2.0	4.0
Group Practice (%) *	17.8%	35.5%	47.4%	55.8%	74.8%
Male (%)	80.0%	80.7%	85.4%	81.8%	83.9%
Specialist (%)	77.8%	74.7%	76.5%	79.5%	83.9%

* Differences among categories are statistically significant at the .01 level.

21.5 percent of respondents who used a PDA for work (but did not use an EMR). Combining the EMR and “PDA Work” physician IT user type categories, about one-third of respondents already used more IT than just the Internet for their clinical work purposes.

The “Internet – Greater Reliance” user type category included 39.4 percent of respondents that used the Internet for work (but not an EMR or PDA), and expected to rely more on the Internet in five years. The “Internet – No Greater Reliance” user type category included 22.4 percent of respondents who used the Internet for work (but not an EMR) but did not expect to rely more on the Internet five years from now. The “No IT” user type category, containing the least advanced users, included 3.8 percent of respondents, who did not use the Internet, PDAs, or EMRs for work purposes.

Demographic Factors Affecting Type of Physician IT User. As indicated in figure 4, practice size was the main demographic factor associated with greater IT use. For example, the percentage of physicians in group practice (2 physicians or more) increased uniformly

from the least to most advanced IT user category, from 17.8 percent for “No IT” users to 74.8 percent for “EMR” users. Similarly, median practice size increased from 1.0 for the “No IT” user type to 4.0 for “EMR” users.

Although differences in age (with the

exception of the least advanced category) and gender were not strong among user categories, both variables were statistically significant predictors in an ordered logistic regression model including all demographic characteristics. Not surprisingly, in the multivariate analysis, increasing practice size was the key statistically significant predictor of a more advanced IT user type category. Being a primary care physician (rather than specialist) had no statistically significant effect on user type.

Use of Specific Types of IT.

Internet use for work. Some 87.7 percent of respondents had used the Internet for work in the past year, while 66 percent used the Internet daily for either work or non-work purposes. These figures are roughly consistent with another recent survey.⁷ About 75 percent of respondents had office access to the Internet, and 26 percent had broadband (cable modem, DSL, or T-1 line) office Internet access.

Figure 5 shows the extent of online activities by different categories of IT users. Mean weekly hours online for work purposes increased steadily, from 2.3 hours for Internet users not expecting greater reliance on Internet use to 4.0 hours for EMR users.

Figure 5. Use of Internet for Work-Related Purposes by Physician IT User Type

	No IT	Internet - No Greater Reliance	Internet - Greater Reliance	PDA Work	EMR
Mean time online per week (hours) *	0.0	2.3	2.7	3.3	4.0
Info Search: Literature Databases (%) *	0.0	29.7%	42.1%	49.2%	60.7%
Info Search: Drug Information (%) *	0.0	16.7%	27.5%	40.7%	40.0%
Info Search: Patient Education Materials (%) *	0.0	13.4%	18.0%	27.5%	27.7%
Info Search: Prof Society (%) *	0.0	15.2%	18.4%	26.4%	20.7%
Info Search: Clinical Trials (%) *	0.0	6.3%	14.8%	20.2%	20.6%
Communications: Colleagues (%) *	0.0	21.2%	32.4%	53.1%	54.8%
Communications: Patients (%) *	0.0	13.4%	23.7%	31.8%	29.7%

* Differences among categories are statistically significant at the .01 level.

Respondents used the Internet for two main purposes: information retrieval and e-mail. For information retrieval, respondents personally used the Internet daily or weekly to search for medical literature (41.7 percent), drug information (28.5 percent), patient education materials (19.6 percent), clinical trials information (19.0 percent), and professional society information (14.3 percent). Another 10.3 percent took CME courses. For communication purposes, over one-third of respondents used e-mail to communicate with colleagues, nearly one-quarter communicated with patients via e-mail, and more than half of those communications pertained to patient symptoms/treatment. For both information retrieval and e-mail, Internet use increased uniformly from the “Internet – No Greater Reliance” to the “PDA Work” and “EMR” user types combined. By definition, the “No IT” user type did not use the Internet for work purposes.

PDA use for work purposes. About one-quarter of respondents used a PDA for work, and twice as many were interested in starting PDA use. By definition, 100 percent of respondents in the PDA category used PDAs, and no respondents in less advanced categories did so. About

36 percent of EMR users also used PDAs for work (figure 6). Interest in future PDA use was substantial.

Responses on future PDA use were sensitive to how the question was posed. When asked if they were interested in using a PDA in the future, 22.8 percent stated they were interested or very interested. However, when asked a more specific question – if they were interested in starting PDA use for one of six clinical tasks – 53.2 percent stated they were interested or very interested, ranging from 44.4 percent for the “No IT” user type to 82.5 percent for the “Internet – Greater Reliance” user type. Using the latter responses, nearly four-

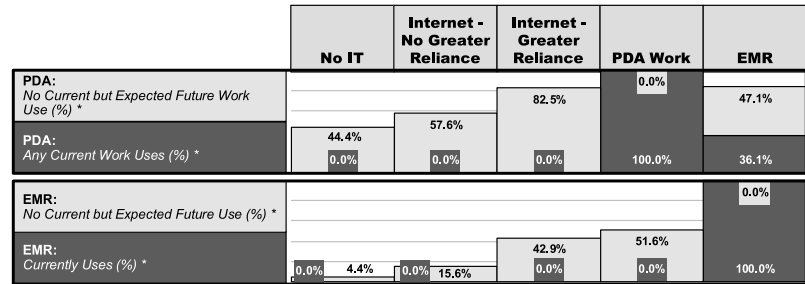
fifths of all respondents used or were interested in using a PDA for work.

EMR use. Although only one in eight respondents (12.9 percent) stated their practices used EMRs, another 31.7 percent of all respondents (excluding current EMR users) stated they were interested or very interested in using “online medical records that can be remotely accessed via the Internet.” Respondents were not asked about their interest in EMRs that were not online. Interest in EMRs was high among “Internet – Greater Reliance” and “PDA Work” IT users – 42.9 percent and 51.6 percent of respondents, respectively, expressed interest in online EMRs (figure 6). Presumably interest would be even greater in all EMRs, not just those that can be remotely accessed via the Internet. Overall, 44.6 percent of respondents either used or expressed interest in using an EMR.

Overall Use of IT for Clinical Management. An important overview of differences in current types of physician IT users is given by current and planned use of IT for clinical management activities, regardless of type of IT (i.e., EMR, PDA, or Internet). Clinically focused IT use has the greatest potential effect on quality of care improvement, and on physician workflow and time. Clinical management activities measured in the survey included use of IT for utilization review, case management, disease management, use of clinical protocols, and drug management. The last three activities are especially central to quality improvement.

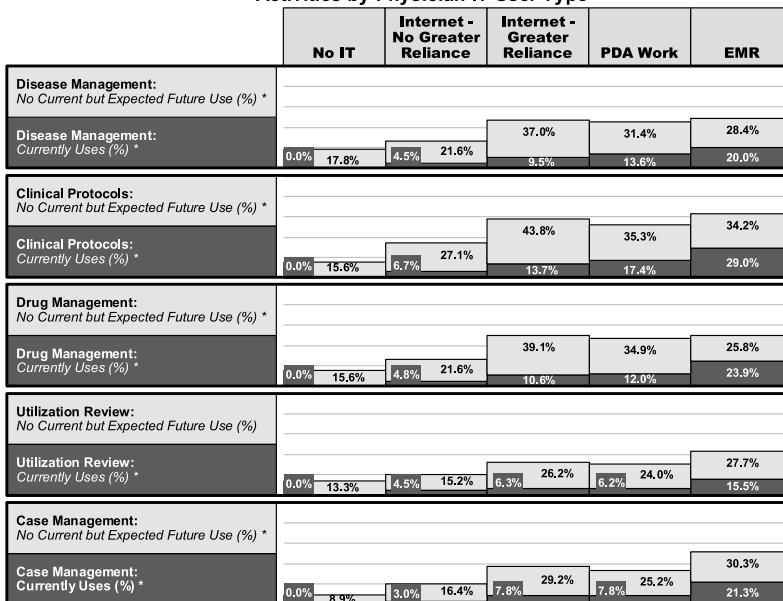
Several key findings emerged: First,

Figure 6. Current and Future Expected PDA and EMR Use by Physician IT User Type



* Differences among categories are statistically significant at the .01 level.

Figure 7. Current and Future Expected Use of Electronic or Online Clinical Management Activities by Physician IT User Type



* Differences among categories are statistically significant at the .01 level.

physicians used little IT for clinical management purposes, ranging from a mere 6.8 percent for utilization review to 14.4 percent for clinical protocols. IT use for clinical management increased monotonically from “Internet – No Greater Reliance” users to EMR users (figure 7). Not surprisingly, the “EMR” user type was three to seven times more likely to use an electronic/Internet-based clinical management activity than the “Internet – No Greater Reliance” type.

For example, 29 percent of EMR users

currently used electronic/Internet-based clinical protocols, versus 6.7 percent for the “Internet – No Greater Reliance” user type. The largest consistent gap in clinical functionality use was between EMR users and all other user types, reflecting the much greater clinical functionality available in EMRs.

A second finding was the relatively low level of use of electronic clinical management by EMR users – even though EMRs have substantial clinical management capabilities, including care

management and follow-up, and are especially well-suited for disease management, drug management, and use of clinical protocols. This suggests substantial under-use of potential EMR capabilities, which is consistent with findings on physician EMR use by one of us (Miller).⁹ Presumably, many EMR users use it for viewing and documenting, and potentially for ordering and messaging, and (correctly) distinguish between such activities and those involving active, systematic clinical management.

A third finding was the relatively high level of planned electronic/Internet-based clinical management activity by all categories, including the “Internet – Greater Reliance” and “PDA Work” user types. This suggests substantial potential demand for greater IT use for clinical management. For example, 43.8 percent of the “Internet – Greater Reliance” use type planned to use electronic/Internet-based clinical protocols, 39.1 percent planned to use electronic drug management, and 37 percent planned to use disease management electronic/Internet-based capabilities.

Current and planned use of IT for clinical management combined is another important indicator of overall physician orientation to IT use. A substantial proportion of physicians either used, or planned to use, IT for clinical management activities that are likely to improve quality, ranging from 40.8 percent for disease management to 50.3 percent for use of clinical protocols. In general, physicians were somewhat less enthusiastic about IT use for activities mainly likely to contain cost.

For clinical management activities, the largest gap in planned use, and in current and planned use combined, was between the three most advanced categories (which had similar percentages) and two least advanced categories (which had similar, and substantially lower, percentages).

The Current and Potential Role of PDA Use in Clinical Care. Current “PDA Work” users used their PDAs predominantly for scheduling (71.7 percent) and drug information retrieval (58.3 percent) (see figure 8). Far fewer used PDAs

Figure 8. PDAs: Current Uses and Interest in Future Use By Physician IT User Type

PDA uses	Current PDA use for work		Interested/very interested in PDA use	Current use for work + interested/very interested in PDA use
	Uses PDA for Work	All respondents	All respondents	All respondents
Any work related purpose	100.0	26.2	53.2	79.4
Professional scheduling	71.7	18.8	#	--
Charge capture	6.4	1.7	32.5	34.0
Write/enter clinical notes	18.8	4.9	#	--
Access drug information	58.3	15.3	47.0	62.3
Access clinical decision support	18.5	4.8	39.0	43.8
Prescribe medication	12.1	3.2	42.8	46.0
View lab results	4.1	1.1	53.4	54.5
Access medical records	4.8	1.3	49.3	50.6

Question not asked.

Figure 9. Physician Views About Online Interaction With Patients by Physician IT User Type

	No IT	Internet - No Greater Reliance	Internet - Greater Reliance	PDA Work	EMR
Currently communicates via e-mail with patients (%) *	0.0%	13.4%	23.7%	31.8%	29.7%
Does not e-mail patients due to liability concerns (%) *	40.0%	56.9%	48.6%	45.0%	47.7%
Believes that e-mail presents a threat to patients' privacy *	24.4%	43.1%	36.2%	32.2%	36.1%
Does not e-mail patients due to fear of too many e-mails (%) *	53.3%	59.1%	57.1%	51.2%	49.0%
Believes that e-mail adds to workload of busy day (%) *	31.1%	55.4%	53.5%	57.0%	47.1%
Believes that e-mail must be dealt with outside of workday *	31.1%	48.0%	56.9%	55.0%	51.0%
Does not use e-mail due to lack of reimbursement (%) *	46.7%	38.7%	32.6%	36.8%	27.7%

* Differences among categories are statistically significant at the .01 level.

for any clinical care purpose other than information retrieval. For example, only 18.8 percent of “PDA Work” users entered clinical notes, 18.5 percent accessed clinical decision support, 12.1 percent used PDAs for e-prescribing, and less than 5 percent used PDAs to view lab results or access medical records (i.e., only about 1 percent of all physician respondents).

Nevertheless, physicians had substantial interest in using PDAs for clinical care purposes. Between 39 percent and 53.4 percent of respondents were interested in starting to use PDAs for four key clinical care purposes: clinical decision support, medical records, prescribing medications, and viewing lab results. Relatively fewer were interested in potential PDA use for charge capture.

E-mail to/from Patients.

Extent of e-mail use and purpose.

Some 23 percent of physicians stated that their offices interacted with patients online, again increasing in frequency from “Internet – No Greater Reliance” through “PDA Work” and EMR user type combined (figure 9). Respondents used e-mail for several clinical care purposes,

including discussing symptoms/treatment with patients online (13.4 percent), determining whether an office visit is indicated (8.1 percent), and notifying patients of test results (6.5 percent). Few handled prescription refills online (4 percent). About 5 percent of physicians used e-mail to schedule appointments or respond to billing inquiries.

“Physicians expect that a 15-minute online consultation with an established patient would be \$56...”

Interest in future patient e-mail.

Exceptionally few physicians were interested in starting to communicate with patients online – a mere 5.6 percent overall. As a result, in communicating with patients, a large majority of respondents – more than 71 percent – did not use e-mail, and were not interested in

doing so.

Common concerns about e-mail use.

One key finding was that physician time and liability concerns about patient e-mail were quite substantial and remarkably consistent across physician IT user type categories (figure 9). More than half of all respondents expressed concerns over time as a reason for not interacting with patients online: 55.1 percent feared too many e-mails, about 53 percent saw e-mails as adding to existing workflows and taking place outside of the current workday, and 35.2 percent did not interact due to lack of reimbursement.

Liability also figured prominently: some 63.6 percent of all respondents were concerned about the liability of e-mail communication and some 49 percent of all respondents gave liability as a reason for not communicating online. Some 36 percent of physicians were concerned about threats of online communication to patient privacy. In contrast, only 19.5 percent of physicians were concerned that e-mails would replace in-person visits.

When asked what would increase their willingness to interact with patients online, 41 percent said insurance reimbursement, and approximately 30 percent mentioned the ability to see more patients, reduce payroll, reallocate staff, increase patient satisfaction scores, and spend less time on the phone. Physicians expect that a 15-minute online consultation with an established patient would be \$56 – this figure was nearly uniform across the categories of physicians.

Note that, at the practice level, 33 percent of physicians reported having a web site, ranging from 13 percent in the least advanced to 53 percent in the most advanced user type categories.

Physician Views on Consumer Use of the Internet.

A substantial number of physicians viewed patients’ use of the Internet favorably (figure 10). Although respondents stated that, on average, only 7.4 percent of patients brought Internet search results to an office visit, 57 percent agreed that patients who access health information are more engaged, 46.2 percent felt it was a good thing

Figure 10. Physician Views About Consumer, Their Own Use of Internet by Physician IT User Type

	No IT	Internet - No Greater Reliance	Internet - Greater Reliance	PDA Work	EMR
Percent of patients who bring online search results to visit (%)	4.0%	5.9%	7.1%	9.2%	9.2%
Feels that patient who use online resources are more engaged (%)	33.3%	41.6%	63.6%	60.1%	65.2%
Feels it is a good thing when patients bring Internet searches (%)	31.1%	37.5%	48.0%	50.8%	52.3%
Feels Internet helps patients understand and discuss needs (%)	24.4%	19.7%	40.4%	40.7%	41.9%
Feels that Internet is essential to practice (%)	8.9%	7.1%	27.7%	30.6%	36.1%
Feels that Internet improves practice efficiency (%)	6.7%	7.1%	30.2%	24.8%	38.1%
Feels that Internet improves clinical knowledge and abilities (%)	6.7%	13.8%	41.4%	47.3%	54.8%
Feels that Internet has potential to radically improve communication (%)	31.1%	26.8%	75.3%	67.1%	72.9%

* Differences among categories are statistically significant at the .01 level.

when patients bring Internet searches, and 35.4 percent agreed that the Internet helps patients understand/discuss their needs. Responses for the two least advanced categories (“No IT” and “Internet – No Greater Reliance”) were similar and lower than responses for the three most advanced categories (which were similar).

The Internet’s Overall Value to Physicians. The value proposition of the Internet was clear to only a minority of respondents. Approximately one quarter of respondents agreed that the Internet was essential to their practice or that the Internet helped them operate more efficiently. A somewhat larger percentage (36.9 percent) agreed that the Web improved their clinical abilities and knowledge. Looking forward, two-thirds of respondents anticipated greater reliance on the Internet and three-fifths felt the Internet had the potential to radically improve communication between provider and patient.

Differences between the two least advanced and three most advanced physician IT user types were pronounced. For the three questions on the current value of the Internet, such differences were particularly stark, underscoring the split in the large group that only used the Internet for work (figure 10). As for the future, some 67-75 percent of physicians in the mid- to high-use categories agreed that the Internet has the potential to radically improve communication among patients, physicians, and health insurance companies, compared with 27-31 percent for the lowest IT use categories.

Study Limitations

Our study has several limitations discussed above, including potential error from non-response, which likely leads to over-estimation of the rates of IT use and anticipation of future use. Moreover, by design, our survey sample focused on office-based solo/small group specialist practitioners, and thus was not intended to be representative of all physicians. As a result, the sample differs from the national physician work force in terms of geographic distribution,

age distribution (physicians age 45 to 64 are over-represented), type of practice (office-based practice is over-represented), practice size (solo practice is over-represented), and type of specialty (specialties are over-represented).

Despite these limitations, the study has data from a large number of physician respondents, and reflects a wide range of physician demographics, spe-

cialties, and opinions about IT. Although the study should not be used to show precise point estimates, it very likely shows orders of magnitude, in terms of use and attitudes toward use for solo/small groups, given the strong patterns of results found here.

Summary and Conclusions

We analyzed 1,200 responses to a Deloitte Research/Fulcrum Analytics survey on physician use of the Internet and other IT. By design, the sample consisted mostly of office-based specialists in solo/small groups (10 or fewer physicians). A somewhat hopeful picture of current and expected physician use of IT emerges, especially of IT that could improve quality of care.

The study results suggest that physicians are not technophobes. About 96 percent of the sample used some IT (the Internet, a PDA, or an EMR) for work-related purposes, including 88 percent that used the Internet for work, about 26 percent that used PDAs for work, and 13 percent that used EMRs. Taken together, over one third of respondents (34.4 percent) used PDAs and/or EMRs for work. In other words, a substantial minority of the sample was already using somewhat or very sophisticated IT for work. Moreover, interest in using PDAs for clinical purposes, and

in using EMRs, was high. The results do not support the stereotype that only young physicians embrace IT – although increasing age was statistically significant in predicting increasing IT use, its effect size was not great.

Two findings about use of IT for clinical management summarize the “bad news” and “good news” of physician IT use. On the one hand, there was very low current IT use for systematic clinical management, including disease management (10.3 percent), drug management (10.9 percent), and clinical protocols (14.4 percent). On the other hand, the results indicate very substantial interest in beginning IT use for the three systematic clinical management activities among all respondents: 30.5 percent for disease management, 31.7 percent for drug management, and 35.9 percent for clinical protocol use. Taking the two results together, about two-thirds of respondents used, or wanted to use, at least one of the three electronically enabled, systematic clinical management activities. Because electronically enabled activities are central to improvement of future patient care quality, this is of vital importance.

The survey results support the usefulness of thinking about a spectrum of physician and other healthcare IT user types,^{10,11} which is consistent with the more general thinking about different types of IT innovation adopters.⁵ We created five hierarchical categories that included respondents who used EMRs (12.9 percent), used PDAs for work (21.5 percent), used the Internet but not other IT for work and expected to rely more on the Internet in five years (39.4 percent) or rely less on the Internet (22.4 percent), and did not use IT (3.8 percent).

Current IT usage for various clinical activities tended to decrease, in some cases monotonically, as one moved down the category hierarchy. Users of PDAs for work and EMR users had remarkably similar responses to many questions, suggesting that many such users have already begun to adopt new IT and are looking forward to greater use of IT.

Overall, the results suggest that a sub-

“The study results suggest that physicians are not technophobes.”

stantial majority in the three more advanced IT user categories are using, or are ready to use, IT for substantial clinical care purposes that could lead to quality improvement. The diffusion of innovation literature suggests that private and public policy attention should be focused on such IT user types – those most favorable to increased adoption and most likely to succeed in IT use for clinical management.

The survey did not directly address several key obstacles to using IT for clinical management that need to be addressed, either by the market or by private/public policy or both. Needed improvements include technology usability (especially for documentation purposes), financial incentives that could motivate greater IT use for quality improvement, comparative information

about what “works” in using IT, and ubiquitous electronic clinical data exchange (e.g., lab results that can be directly imported into an EMR).^{2,9,12} Over time, such improvements could help convert the substantial interest in electronically enabled processes shown in this survey into actual use of IT that can improve quality of care.

Given that the process of IT diffusion among the physician workforce may well continue to be slow and policy interventions to hasten the process may be costly, identifying those most likely to succeed in using IT for quality improvement, and focusing policies on such physicians, could conserve resources, while producing positive experiences that could inspire those who are more reluctant to use IT in their clinical work.

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