Electronic Medical Records: The *FPM* Vendor Survey

The advent of Internet-based EMR systems gives you new options. Here we report on 23 conventional systems and five Internet-based ones.

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The year 2000 seemed like the perfect time to conduct *Family Practice Management*'s third survey of electronic medical record (EMR) vendors. The market and products have changed considerably since the last survey was conducted in 1997. The most noticeable change has been the migration of EMRs from the desktop to the Internet. The Application Service Provider (ASP) model, as it's called, enables practices to "rent" EMR software from vendors. Physicians can download the software from the vendor's Web site and run it on their own systems, or they can use a browser to interact with it. Data is stored at an off-site location rather than on a file server in the physician's office. Many of these Internet-based EMRs allow patients access to their personal medical records, which raises security and confidentiality concerns, but also presents the opportunity for patients to participate more fully in the decision making and treatment planning processes. (For more information on Application Service Providers, see "Lowering the Cost of Practice Management," *FPM,* June 2000, page 69.)

Other significant changes in EMR product design include the availability of biometric identifiers and a broader range of data entry methods. Biometric identifiers use physical characteristics unique to a particular individual, such as a fingerprint or retinal pattern, to identify users. This technology might eventually make password protection obsolete. Data entry methods have also evolved; more vendors now offer light pens, touch screens and voice recognition as alternatives to the keyboard and mouse.

KEY POINTS:

- Four systems received five-star ratings for general design: ChartWare, EpicCare, Health Probe and QD Clinical.

- Four systems received five-star ratings for their provider features: ChartWare, EpicCare, Health Probe and Logician.

- Two systems received five-star ratings for their patient features: EpicCare and Logician.

- Three systems received an overall five-star rating: ChartWare, EpicCare and Health Probe.

Survey design

The questionnaire was based on the versions used in 1995 and 1997 but was reviewed and updated to include questions about ASP-model EMRs. It was 31 pages long and divided into four sections: I. General Design Attributes, II. Functionality for Health Care Providers, III. Functionality for Patients, and IV. EMR System Market, Functional Requirements and Costs. Each section had multiple subsections. (A more detailed description of the instrument is included in the online version of this article at www.aafp.org/fpm/20010100/46elec.html.)

Two important caveats to keep in mind as you review the results:

• Literally hundreds of products are identified as EMRs, and while we made a good faith effort to contact as many vendors as possible, many chose to not respond. ▶

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• The survey findings are based on what *vendors* said about their *own* products.

Respondent characteristics

As in 1997, 28 surveys were returned, but this time they came from only 25 vendors. Three submitted questionnaires on both conventional systems and ASP systems. Overall, responses covered 23 conventional systems and five ASP systems. Four companies reported having launched their EMR systems in the 1980s; the remainder launched their products in the 1990s.

Only nine of the respondents to our 1997 survey responded to the 2000 survey. This can be attributed at least in part to the dynamic nature of the EMR market. Some vendors have gone out of business, some have been acquired, and some have decided to no longer develop or support EMRs. For example, while the survey was being conducted, MedicaLogic and Medscape merged under the Medscape name. Pharmaceutical companies have also ventured into the EMR business. Glaxo Wellcome Inc. formerly supported HealthMatics, and Pfizer is presently supporting PenChart. The market is in a state of disequilibrium and will continue to be for some time. (With that in mind, remember that the features listed for any of the systems may have changed since our data was collected in mid-2000.)

Operating systems. Windows 95/98/2000 versions are available for all 28 products and Windows NT versions for 24. Unix versions are available for 11, Linux for three, Novell for six, and Macintosh for three. None of the vendors reported offering a DOS version.

Intended markets. The majority of the products are intended for practices of any size. ENTITY, Logician, NextGen and Clinical Works Module (ASP) are designed for practices with four or more physicians and multiple sites. EpicCare, PEARL and Physician Practice Solution (conventional system) are designed for practices with 10 or more physicians and multiple sites. Although these products are designed for use at multiple sites, they can be used by practices with just one site.

Live sites. When the survey was conducted, two of the products, O-HEAP and ComChart, had just entered the market and reported one live site each. One other product had fewer than 10 live sites. Five products had fewer than 100 live sites and the remainder reported 100 or more live sites.

Cost. The range of prices submitted by the vendors for different office configurations varied greatly, and the most common responses reported by the vendors were "variable" or "depends on practice." Given the complexity of EMR pricing, we can appreciate why some vendors were ambivalent about responding. Some EMR products are priced per user license. Others charge more for the first license

Composite ratings of 28 CPR systems

Scores for the systems were determined as follows:

★★★★★ Has more than 90 percent of the important functionality
★★★★ Has 76 percent to 90 percent of the important functionality
★★★ Has 51 percent to 75 percent of the important functionality
★★ Has 25 percent to 50 percent of the important functionality
★ Has less than 25 percent of the important functionality

The overall score is based on an unweighted average of the three individual scores, rounded to the nearest integer.

EMR system	General design	Functionality for health care provider	Functionality for patient	Overall score
ChartWare	★★★★★	★★★★★	★★★★	★★★★★
Charting Plus	★★★	★	★	★★
ComChart	★★★	★★	★	★★★
DOCU*MENTOR	★★★★	★★	★★★	★★★
Dossier	★★★★	★★★	★	★★★
Dr. Notes Program	★★★★	★★★	★★	★★★
ENTITY	★★★	★★	★★	★★★
EpicCare	★★★★★	★★★★★	★★★★★	★★★★★
Health Probe Patient Information Manager	★★★★★	★★★★★	★★★	★★★★★
HealthMatics	★★★★	★★	★	★★★
Logician	★★★★	★★★★★	★★★★★	★★★★
MedicWare EMR	★★★★	★★	★	★★★
NextGen	★★★★	★★★★	★★★	★★★★
O-HEAP	★★★★	★★★	★★★	★★★
Partner	★★★	★★	★★★	★★★
PEARL	★★★★	★★★	★★★	★★★★
Physician Practice Solution	★★★★	★★★	★★	★★★★
PowerMed EMR	★★★★	★★★	★	★★★★
Practice Partner Patient Records	★★★★	★★★★	★★★	★★★★
QD Clinical	★★★★★	★★★★	★★★	★★★★
SOAPware	★★★★	★★★★	★★★	★★★★
VersaForm CPR	★★★	★★	★	★★★
Welford Chart Notes	★★★★	★★★	★★★	★★★★
Clinical Works Module (ASP)	★★★★	★★★	★★★★	★★★★
Logician Internet (ASP)	★★★	★★	★★	★★
NextGen (ASP)	★★★★	★★★★	★★★	★★★★
Physician Practice Solution (ASP)	★★★★	★★★	★★	★★★★
topsChart (ASP)	★★★★	★★★★	★★★	★★★★

and discount subsequent licenses depending on the number of users. Some vendors bundle the costs of the hardware and software.

Another thing to consider is how much it might cost you to add functionality in the future. For example, some low-priced EMR products are available, but their functionality is limited. These types of EMRs may be ideal starter systems, but you'll have to pay a premium to add bells and whistles later. On the other hand, you could spend a lot of money on a full-featured system and use only 5 to 10 percent of its functionality.

The most commonly reported pricing structure for ASP systems was a start-up fee plus a monthly subscription rate. Some ASP systems (none of those who responded to the survey) also charge transaction fees. Our best advice is to find a practice similar to yours that is using an EMR system you're interested in and inquire about specific costs.

There is not much information available on return on investment for EMR systems. We'd suggest adding up how much your practice spends each year on chart supplies, forms, transcription fees, photocopying and storage. Factor in the hidden costs of time spent looking for lost charts, reconstructing charts, etc. Undoubtedly, you are spending a great deal more than you think.

General design

For an overview of the designs of systems covered in our survey, see "General design features of 28 EMR Systems" on page 50.

Data elements. All the products incorporate an extensive array of data elements, either by coded entry or by free text. The percentage of codable data elements that are coded ranges from 33 percent (VersaForm CPR) to 100 percent (ChartWare, EpicCare and NextGen's conventional system and ASP).

Structure and organization of data. All but three conventional systems and one ASP system support problem orientation. On the other hand, less than half of all systems support family orientation. All but one system (O-HEAP) include built-in diagnosis and procedure codes. Most of the systems include or allow the inclusion of several coding systems, and most have data dictionaries. All but four systems feature graphical interfaces. Eight have character-based interfaces. All systems except O-HEAP and Clinical Works Module (ASP) have rapid screen updates of 1 to 2 seconds. O-HEAP and Clinical Works Module

do not allow highlighting of important data. HealthMatics and MedicWare EMR are the only two products that do not allow any type of customizable views. All products except DOCU*MENTOR provide summary views. Twenty-six products allow multiple parts of records to be viewed simultaneously, but only nine conventional systems and two ASP systems can display multiple records at one time. All products except Charting Plus and PEARL allow users to search for specific patient data by date or problem and 17 of the systems support searching by text strings. All systems support data entry by keyboard, 27 by mouse, 19 by light pen, 19 by touch screen and 20 by voice recognition.

Accessibility. All systems except for two of the ASP systems (Logician Internet and topsChart) allow more than one user to access an individual record or data element simultaneously. The majority of systems support access by modem or the Internet and more than half of the systems allow records to be downloaded to a portable device (e.g. a laptop, a pen tablet or a hand-held), updated, and later uploaded to the main system. Estimated downtime per 24-hour period was reported as none for 23 systems, zero to 1 hour for four systems and 1 to 2 hours for one system.

Interfaces and e-mail. All products except Dr. Notes Program, O-HEAP and Logician Internet incorporate interfaces with practice management software. Twenty-two interface with appointment scheduling software and 18 interface with financial software. All but five products have internal e-mail systems, and 17 systems support external e-mail.

Training. Fourteen products provide context-sensitive help from all system screens. Twenty-four provide printed training materials for all user types. All but two products (ComChart and QD Clinical) provide complete training manuals online and in hard copy. Seventeen vendors provide multimedia tutorials, and all but four provide live tutorials on site. Physician training time for the ASP systems does not differ significantly from the conventional systems.

Confidentiality. All 28 systems have password protection, although only 12 require password changes at regular intervals. Seven systems generate passwords automatically.

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Seven products also support biometric (e.g. fingerprint) identification. All systems except Partner limit access by specific functions: 22 to specific records, 22 to subsections of records, and 21 by discrete data elements. All products except Charting Plus, Partner and PowerMed EMR generate audit trails of access to the system, but only 10 warn the system administrator of unauthorized access. Twenty products incorporate automatic screen time-outs to limit unintended access.

Accuracy and integrity. Twenty products have error-checking algorithms for all data that aren't free text, and 21 will limit data entry to specific users. All but two systems had mechanisms in place to track which users enter new data or make changes to existing data. Sixteen systems store the original data entry even after changes have been made. Database integrity is maintained by redundant real-time storage in 24 systems and by backup in 26 systems.

Overall. Conventional EMRs having the most complete design features include Chart-Ware, EpicCare, Health Probe and QD Clinical. The ASP EMRs having the most complete design features include Clinical Works Module, NextGen, Physician Practice Solution and topsChart.

Characteristics of vendors and EMR systems

Vendor name	Program name	Version number	Mode of operation	Intended market [1]	Operating systems [2]	Contact information	Date vendor established
ChartWare	ChartWare	32	Conventional	S, M, L, U2-5, U6+	W95, WNT, N, Unix, Linux, Other, Internet	www.chartware.com	1995
MediNotes Corp	Charting Plus	4	Conventional	S, M, L, U2-5, U6+	W95, WNT	www.medinotes.com/charting.htm	
ComChart	ComChart		Conventional	S, M, L	W95, WNT, Mac	www.comchart.com	1999
A*A Data	DOCU*MENTOR	1	Conventional	S, M, L, U2-5, U6+	W95, WNT, N	A*A Data, Lubbock, TX (806) 763-5775	1984
Purkinje	Dossier	2	Conventional	S, M, L, U2-5, U6+	W95, WNT, Unix	www.purkinje.com	1978
Datamed	Dr. Notes Program	1.6	Conventional	S, M, L, U2-5, U6+	W95, WNT	www.drnotes.com	1987
Health Care Data Systems	ENTITY	3.1	Conventional	M, L, U2-5, U6+	W95, WNT	www.hcds.com/products/products.htm	1982
Epic	Epic Care		Conventional	L, U2-5, U6+	W95, WNT, Unix, Linux, Other	www.epiccare.com/products.html	1979
Health Probe	Health Probe Patient Information Manager	5	Conventional	S, M, L, U2-5, U6+	W95, WNT	www.healthprobe.com	1985
A4 Health Systems	HealthMatics	4.5	Conventional	S, M, L, U2-5, U6+	W95, Unix	www.a4healthsystems.com	
Medicalogic/Medscape	Logician	5.2	Conventional	M, L, U2-5, U6+	W95, WNT, Unix	www.medicalogic.com	1985
MedicWare	MedicWare EMR	4	Conventional	S, M, L, U2-5, U6+	W95, WNT	www.medicware.com	1980
Clinitic	NextGen	3.21	Conventional	M, L, U2-5, U6+	W95, WNT, Other	www.nextgen.com	1994
Intelligent Medical Objects	O-HEAP		Conventional	S, M, L, U2-5, U6+	W95, WNT	www.imo-online.com	1994
PCC	Partner	3.1	Conventional	S, M, L, U2-5, U6+	W95, Unix, Mac, Linux	www.pcc.com/support/solution.html	1983
Medical Information Management	PEARL	3.2	Conventional	L, U2-5, U6+	W95, Unix	www.imrac.com	1993
Cerner Corp.	Physician Practice Solution		Conventional	L, U2-5, U6+	W95, WNT, N, Unix	www.cerner.com	1979
Power Med Corporation	PowerMed EMR	6	Conventional	S, M, L, U2-5	W95, WNT, Mac,	www.powermed.com	1995
Physician Micro Systems, Inc.	Practice Partner Patient Records	7.2	Conventional	S, M, L, U2-5, U6+	W95, WNT, N, Unix	www.physicianmicrosystems.com	1983
STAT! Systems	QD Clinical	3.4	Conventional	S, M, L, U2-5, U6+	W95, WNT, N	www.statsystems.com	1989
DOCS, Inc.	SOAPware	4	Conventional	S, M, L, U2-5, U6+	W95, WNT	www.docs.com	1995
Versaform	VersaForm CPR		Conventional	S, M, L, U2-5	W95, WNT, Unix	www.versaform.com	1981
Medcom Information Systems Inc.	Welford Chart Notes		Conventional		W95, WNT	idt.net/~medcom19/welford.html	1991
IDX Systems Corporation	Clinical Works Module	4.3	ASP	M, L, U2-5, U6+	W95, WNT	www.idx.com	1969
Medicalogic/ Medscape	Logician Internet	2	ASP	S, M	W95	www.medicalogic.com	1985
Clinitic	NextGen	3.21	ASP	M, L, U2-5, U6+	W95, WNT, Other	www.nextgen.com	1994
Cerner Corp.	Physician Practice Solution ASP		ASP	S, M, L, U2-5, U6+	W95, WNT, N, Unix	www.cerner.com	1979
e-MDs	topsChart	2	ASP	S, M, L, U2-5, U6+	W95, WNT, Internet	www.topschart.com	

1. Intended market: S = 1-3 providers; M = 4-9 providers; U2-5 = organizations with 2 to 5 sites; U6+ = organizations with 6 or more sites

Health care provider functionality

Features of particular interest to physicians — records management, case management and reporting features — are displayed in "Health care provider features of 28 EMR systems," page 52.

Records management. Twenty-three products incorporate results-reporting features (allowing the physician or another provider to review and electronically sign reports, including notes for visits and telephone calls, laboratory data, ancillary studies, consultations and hospital discharge summaries.) Two conventional systems (HealthMatics and Partner) and one ASP system (Logician Internet) incorporate some of these features. Two conventional systems (Charting Plus and VersaForm CPR) incorporate none.

Release date	Employees	Small (1-3 providers)	Medium (4-9 providers)	Large (> 10 providers)	Multisite (2-5 sites)	Multisite (>5 sites)	Total practices	Total physicians
1995							250	350
	20	500	80	10	300	5	1000	1300
1999	1	1					1	1
1985	3	6						
1994	90	200	20	5	2	1	225	800
1992	22						450	1200
1994	100	4	6	6				
1992	387			4	6	21	31	30000
1986		1000	25				1000	1000
1985	300							
1994	600	12	18	15	5	2	52	220
1995	110	15	70	10	60	40	150	1500
	24	1						
1990	30	25	100	25	25	3	200	700
1995	40	1	2	2	4	3	13	281
1995	2700							
1995	17	325	25		2		350	550
1987	65	300	90	60	40	10	500	2300
1992	20	1200	500	50	10		1800	2500
1995		2000	100		10		2100	2600
1998	10	21					21	21
1992	25	230	80	35	15	1	360	750
1996	3670	59						
1999	1000							4000
1995	110	15	70	10	60	40	150	1500
1995	2700							
1999	45						662	

2. Operating systems: Mac = Macintosh; N = Novell; W95 = Windows 95/98/2000; WNT = Windows NT

Individual case management. Twenty-four systems have at least two of the three chart maintenance features we asked about in our survey (prompts to update problem, medication and allergy lists). The twenty-six systems that support problem orientation all maintain the record's problem orientation when problem lists are modified. One conventional system (Charting Plus) did not include any of these features. Each ASP incorporated them all. All but three systems (ComChart, O-HEAP and Logician Internet) support forms, such as insurance, school and/or sports physicals, and referral letters. Twenty-six systems enable patient visit summaries.

Twenty-six products provide some type of preventive services tracking and reminder functions. Eight conventional systems and two ASP systems provide the complete range of features, including default algorithms, the ability to modify algorithms by practice and patient, tracking of patient refusals, and issuing of reminders for health care providers. Eight conventional systems and two ASP systems provide complete features of disease-specific reminders.

Twenty products allow tracking of health-related quality-of-life or functional-status measures. Twenty-three products allow graphical displays of data over time, and 20 have pediatric growth charts. Thirteen products can produce statistical control charts that can be used to display time series of clinical data in individual patients and for quality improvement projects. DOCU*MENTOR and Logician Internet do not include any of these features.

Nine systems interface with expert-system software, with ChartWare and Welford Chart Notes providing the most related features. Twenty-one systems provide access to practice guidelines and other literature, either through an integrated browser or another interface.

Twenty-six systems enable users to enter orders, and 19 enable direct communication with the unit responsible for executing the order. Twenty-five systems provide audit trails, and 22 track order completion. Twenty-four products allow ordering of diagnostic tests. One ASP, NextGen, offered the entire range of order entry options, as did four conventional systems.

Twenty-four products offer some combination of therapeutic services order-entry features, including test inventory, cost, insurance coverage, local availability, performance characteristics, alternative tests and standard order sets. Charting Plus, ENTITY, O-HEAP and Partner provided none. Seven systems provided the entire range of functions.

Twenty-three products offer some pharmaceutical management functions, such as a drug database, multiple formularies, allergy checking, drug/drug interaction checking, etc. Charting Plus, Partner and Logician Internet did not include any of these features. Five systems included all the pharmaceutical management functions we asked about. Twelve systems maintain information about consultants and insurance coverage. Eleven systems do neither.

Text continues on page 54 after tables.

General design features

Legend:
● = Most or all of the elements (76 to 100 percent)
◗ = Some of the elements (25 to 75 percent)
○ = Few or none of the elements (0 to 24 percent)

Data elements / Structure and organization

Product	Patient identifiers	Activity status	Historical database	Social history	Family history	Basic risk indicators	Problem lists	Visit notes	Vital signs	Laboratory data	Images	Drawings	Medication lists	Immunization records	Preventive services	Hospitalization information	Consultation reports	Written correspondence	Reports of ancillary studies	Percentage coded	Unlimited entries	User/site definable elements	Family orientation	Problem orientation	DX & Tx codes built-in	ICD-9	ICD-10	ICPC	UMLS	DRG	ICHPPC	CPT-4
ChartWare	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	100%	✓	✓	✓	✓	✓							✓
Charting Plus	●	●	●	●	●	●	◗	●	●	●	○	◗	●	●	○	◗	●	●	○	61%		✓	✓	✓	✓							✓
ComChart	●	◗	●	◗	●	●	◗	◗	●	●		○	●	●	◗	●	○	●	◗	50%		✓		✓		✓						✓
DOCU*MENTOR	●	●	●	●	●	●	●	●	●	●	●	●	●	●	◗	●	●	●	●	79%	✓	✓		✓	✓	✓						✓
Dossier	●	●	●	●	●	●	●	●	◗	●	●	●	●	●	●	●	●	●	●	86%	✓		✓	✓	✓							✓
Dr. Notes Program	●	●	●	◗	●	●	●	●	●	●	◗	●	●	●	◗	●	●	●	●	90%	✓		✓	✓	✓							✓
ENTITY	●	◗	●	●	●	●	●	●	●	●	○	●	○	◗	○	○	○	○	○	77%	✓	✓	✓	✓	✓							✓
EpicCare	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	100%	✓	✓	✓	✓	✓							✓
Health Probe Patient Information Manager	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	55%	✓		✓	✓	✓							✓
HealthMatics	●	●	●	●	●	●	●	●	●	◗	◗	●	●	○	●	●	●	●	●	81%	✓		✓	✓	✓							✓
Logician	◗	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	89%	✓	✓	✓	✓	✓	✓						✓
MedicWare EMR	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	◗	●	●	●	85%	✓		✓	✓	✓							✓
NextGen	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	●	●	●	100%	✓		✓	✓	✓							✓
O-HEAP	●	●	●	●	●	●	●	●	●	●	●	◗	●	●	◗	○	●	●	●	83%	✓	✓	✓	✓		✓						✓
Partner	●	●	●	◗	◗	○	◗	◗	○	◗	○	○	◗	○	◗	◗	◗	◗	○	59%	✓	✓	✓	✓	✓							✓
PEARL	●	●	●	●	●	●	●	●	●	●	●	●	◗	●	●	●	●	●	●	88%	✓		✓	✓	✓							✓
Physician Practice Solution	●	●	●	●	●	●	●	●	◗	◗	●	●	●	●	●	●	●	●	●	93%	✓		✓	✓	✓	✓						✓
PowerMed	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	76%	✓		✓	✓	✓							✓
Practice Partner Patient Records	●	●	●	●	●	●	●	●	●	●	◗	●	●	●	●	●	●	●	●	58%	✓		✓	✓	✓							✓
QD Clinical	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	94%	✓	✓	✓	✓	✓				✓			✓
SOAPware	●	●	●	●	●	●	●	●	●	●	●	◗	●	●	●	●	●	●	●	39%	✓		✓	✓	✓					✓	✓
VersaForm CPR	◗	○	●	◗	●	●	●	●	●	●	●	○	●	●	●	●	●	●	●	33%	✓		✓	✓	✓							
Welford Chart Notes	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	73%	✓	✓		✓	✓							✓
Clinical Works Module (ASP)	●	●	●	●	●	●	●	●	●	○	○	●	●	●	◗	◗	◗	◗		65%	✓	✓	✓	✓	✓							✓
Logician Internet (ASP)	◗	◗	●	●	●	●	●	●	●	○	○	○	◗	●	○	○	○	○	○	40%	✓			✓	✓	✓						✓
NextGen (ASP)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	100%	✓		✓	✓	✓							✓
Physician Practice Solution (ASP)	●	●	●	●	●	●	●	●	●	●	◗	◗	●	●	●	●	●	●	●	93%	✓		✓	✓	✓	✓						✓
topsChart (ASP)	●	●	●	◗	●	●	●	●	●	●	●	●	●	●	●	●	●	●	◗	99%	✓	✓	✓	✓	✓					✓	✓

Interfaces / E-mail / Training / Confidentiality / Access limitations

Product	Financial/appointment	Access to apps from EMR	Access to financial from EMR	Integrated word processor	Integrated dictation program	Laboratory data	Radiology reports	Other diagnostic tests	Consultation reports	Discharge summaries	Within practice	Outside practice	Patient-physician	Context-sensitive help	Manuals for all user types	Manuals online & printed	Multimedia tutorials	Onsite tutorials available	Training hrs: Physician	Training hrs: Nurse	Training hrs: Administrator	Password access	Auto. password generation	Req. password changes	Biometric user ID	By function	By record	By record subsection	By data element	Access audit trail
ChartWare	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	0-4	0-4	0-4	✓	✓	✓	✓	✓	✓	✓	✓	✓
Charting Plus	✓			✓	✓										✓	✓	✓		8-16	8-16	8-16	✓				✓		✓		
ComChart	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓					✓	4-8	0-4	4-8	✓				✓			✓	✓
DOCU*MENTOR	✓	✓		✓						✓	✓	✓		✓			✓	✓	4-8	0-4	>24	✓				✓			✓	✓
Dossier	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓		4-8	4-8	8-16	✓				✓	✓	✓		✓
Dr. Notes Program			✓		✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	4-8	4-8	8-16	✓		✓	✓	✓	✓	✓	✓	✓
ENTITY	✓	✓	✓	✓	✓	✓					✓	✓			✓			✓	8-16	8-16	16-24	✓				✓		✓	✓	✓
EpicCare	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	4-8	4-8	8-16	✓	✓	✓	✓	✓	✓	✓	✓	✓
Health Probe Patient Information Manager	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0-4	0-4	0-4	✓		✓	✓	✓	✓		✓	✓
HealthMatics	✓	✓	✓	✓		✓					✓			✓				✓	8-16	4-8	8-16	✓		✓		✓	✓		✓	✓
Logician	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	4-8	4-8	4-8	✓				✓	✓	✓	✓	✓
Medic Ware EMR	✓	✓			✓	✓	✓	✓	✓	✓		✓	✓	✓			✓		4-8	0-4	4-8	✓				✓			✓	✓
NextGen	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	4-8	4-8	>24	✓	✓			✓	✓	✓	✓	✓
O-HEAP									✓	✓	✓			✓	✓				4-8	0	0			✓		✓	✓	✓	✓	✓
Partner	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	0-4	0-4	0-4	✓				✓	✓	✓	✓	✓
PEARL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						✓	4-8	8-16	>24	✓				✓	✓	✓	✓	✓
Physician Practice Solution	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓			✓		4-8	8-16	16-24	✓	✓	✓	✓	✓	✓	✓	✓	✓
PowerMed	✓			✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	0-4	0-4	0-4	✓				✓	✓	✓	✓	
Practice Partner Patient Records	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				4-8	4-8	4-8	✓				✓	✓	✓	✓	✓
QD Clinical	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	4-8	4-8	8-16	✓	✓	✓		✓	✓	✓	✓	✓
SOAPware	✓			✓	✓	✓	✓	✓	✓				✓			✓	✓		0-4	0-4	0-4	✓			✓	✓	✓	✓	✓	✓
VersaForm CPR	✓	✓			✓									✓		✓	✓	✓	4-8	4-8	8-16	✓				✓	✓	✓		✓
Welford Chart Notes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓	4-8	0-4	8-16	✓				✓	✓	✓	✓	✓
Clinical Works Module (ASP)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓		✓		0-4	0-4	0-4	✓			✓	✓	✓		✓	✓
Logician Internet (ASP)				✓										✓	✓	✓	✓		0-4	0-4	0-4	✓				✓				✓
NextGen (ASP)	✓	✓	✓	✓	✓	✓					✓	✓	✓		✓	✓	✓		4-8	4-8	>24	✓	✓			✓	✓	✓	✓	✓
Physician Practice Solution (ASP)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	4-8	8-16	16-24	✓	✓	✓	✓	✓	✓	✓	✓	✓
topsChart (ASP)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			0-4	0-4	0-4	✓			✓	✓	✓		✓	✓

Ease of use — **Accessibility**

SNOMED	Other	Data dictionaries	Character-based	Graphical	Object oriented	Text	Tables	Graphics	Audiovisual	Screen updates in 1-2 sec.	Highlights important info.	Views site-customizable	Views user-customizable	Views user-type-customizable	Summary view	View multiple parts of rec.	View multiple records	By date	By problem	By text search	By family	Keyboard	Mouse	Light pen [stylus]	Touch screen	Voice/speech recognition	Enter data once	Multiple simultaneous users	Dial-in to dedicated server	Citrix WinFrame	World Wide Web	Other mode of access	Download to portable	Access by touch tone	Routine downtime/24 h	Actual downtime/24 h
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		0	0-1
			✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓						✓	✓	✓	✓	✓	✓	✓			✓				0	0-1
			✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓			✓	✓	✓		✓				0	0-1
	✓		✓		✓			✓	✓	✓	✓	✓		✓	✓	✓		✓	✓		✓	✓	✓			✓					✓	✓		0	0
	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				0-1	0-1
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓							0	0-1
			✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓			✓	✓	✓					✓		0	0
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	0-1
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	0-1	1-2
✓		✓		✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓		✓	✓		✓	✓		✓		✓	✓	✓	✓					1-2	1-2
✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					0	0-1
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓			0-1	0-1
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	✓	✓	✓		✓	✓		✓	✓	✓		✓	✓		✓	✓	✓	✓		✓		✓	✓	✓		✓	✓		✓		✓			0-1	0-1
	✓		✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓					0	0-1
✓		✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓	✓	✓	✓		✓					0	0-1
	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	0	0-1
✓		✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			0	0-1
		✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			0	0-1
		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			0	0-1
		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓				0	0
	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	0	0-1
✓		✓		✓	✓	✓	✓			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓				0	0-1
	✓		✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓		✓	✓			✓			✓			0	0-1
	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	0-1
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	✓		✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓			✓		0	0-1

Accuracy and integrity — Audit trails

Improper access warning	Screen time-outs	Error-checking on all but free text	Data entry limited by user	Entering new data	Changing existing data	Copy kept of data changed	Redundant data storage	Backup
✓	✓		✓	✓		✓	✓	✓
				✓	✓		✓	✓
		✓	✓	✓	✓			✓
			✓		✓			
		✓		✓	✓	✓	✓	✓
		✓	✓	✓	✓	✓	✓	✓
	✓						✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓	✓
✓		✓	✓	✓	✓	✓	✓	✓
✓	✓	✓		✓	✓		✓	✓
	✓	✓	✓	✓	✓		✓	✓
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	✓	✓	✓	✓	✓	✓	✓	✓
		✓	✓	✓			✓	✓
	✓	✓		✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓
		✓	✓					✓
		✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓		
	✓			✓	✓	✓	✓	✓
		✓	✓	✓	✓		✓	✓
✓	✓	✓		✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓		✓	
	✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓		✓	✓
	✓	✓		✓	✓	✓	✓	✓
	✓	✓		✓	✓	✓	✓	✓

Health care provider features

Records management / Forms completion and record transmission / Case management

Product	Notes for own visits and calls	Notes for visits with other providers	Notes for calls with other providers	Laboratory studies	Radiology reports	Consultation reports	Discharge summaries	Insurance forms	School exam forms	Sports exam forms	Work and school excuse forms	Referral letters	Summaries for patients	Test report letters	Print patient record	Transmit patient record	Transmit with encryption	Problem list update	Allergy list update	Medication list update	Keeps problem orientation	Services tracked	Algorithms available (general population)	Algorithms available (risk groups)	Modifiable for practice	Modifiable for patient	Tracks provider exclusions	Tracks patient refusals
ChartWare	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓		✓
Charting Plus											✓	✓		✓														
ComChart	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓							✓	✓	✓	✓	✓	✓	✓	✓
DOCU*MENTOR	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		✓
Dossier	✓	✓	✓	✓	✓	✓	✓				✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓		✓
Dr. Notes Program	✓	✓	✓	✓	✓	✓	✓				✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			✓
ENTITY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓		✓		✓	✓		
EpicCare	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Health Probe Patient Information Manager	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
HealthMatics	✓	✓	✓	✓	✓				✓	✓	✓	✓			✓	✓	✓	✓	✓	✓								
Logician	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
MedicWare EMR	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓				✓	✓		✓	✓		✓		✓	✓		
NextGen	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓		✓		✓	✓		✓
O-HEAP	✓	✓	✓	✓	✓	✓	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Partner	✓		✓	✓				✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓		✓		✓	✓		
PEARL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓			✓
Physician Practice Solution	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓
PowerMed	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
Practice Partner Patient Records	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
QD Clinical	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SOAPware	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
VersaForm CPR								✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓					
Welford Chart Notes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Clinical Works Module (ASP)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Logician Internet (ASP)	✓	✓													✓				✓	✓	✓	✓						
NextGen (ASP)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Physician Practice Solution (ASP)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓						✓	✓
topsChart (ASP)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Decision support - order entry with test-ordering support

Product	Order entry functions	Communication with units responsible	Audit trails	Order completion tracking	Complete test inventory	Costs	Insurance coverage	Local availability	"Sensitivity, specificity, etc."	Alternative tests	Standard order sets	Modifiable by provider	Complete service inventory	Efficacy	Costs	Insurance coverage	Local availability	Standard order sets	Modifiable by provider	Drug database	Multiple formularies	Formulary linked to patient	Costs	Dosage algorithms	Allergy checking	Adverse reaction checking	Drug-drug interaction checking	Drug-disease interaction checking	Drug administration information checking	Easy prescription information renewal	Consultant list by condition
ChartWare	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Charting Plus																															
ComChart	✓		✓	✓	✓							✓							✓			✓						✓	✓		
DOCU*MENTOR	✓	✓			✓				✓	✓	✓		✓	✓	✓	✓		✓		✓											✓
Dossier		✓	✓		✓			✓	✓			✓	✓	✓	✓	✓				✓	✓	✓		✓	✓				✓	✓	
Dr. Notes Program	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓		✓			✓			✓			✓	✓	✓		✓	✓	✓	✓
ENTITY	✓		✓	✓	✓					✓								✓	✓	✓			✓	✓	✓			✓			
EpicCare	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Health Probe Patient Information Manager	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓	✓	✓	✓	✓
HealthMatics	✓	✓	✓	✓	✓						✓						✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	
Logician	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MedicWare EMR	✓	✓	✓	✓	✓						✓						✓	✓	✓	✓	✓	✓	✓	✓	✓				✓		
NextGen	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓			✓	✓		
O-HEAP	✓				✓		✓			✓	✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Partner	✓		✓	✓		✓																								✓	
PEARL	✓		✓	✓	✓	✓	✓			✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓		
Physician Practice Solution	✓	✓	✓	✓	✓		✓	✓		✓		✓		✓	✓	✓		✓		✓			✓	✓	✓			✓	✓		
PowerMed	✓	✓	✓	✓	✓			✓	✓	✓				✓	✓		✓	✓	✓	✓	✓					✓	✓				
Practice Partner Patient Records	✓		✓	✓	✓	✓	✓			✓	✓		✓	✓		✓		✓	✓	✓	✓						✓	✓		✓	
QD Clinical	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
SOAPware	✓	✓	✓	✓	✓			✓	✓		✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		
VersaForm CPR	✓			✓						✓	✓	✓					✓	✓												✓	
Welford Chart Notes	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Clinical Works Module (ASP)	✓	✓	✓	✓	✓				✓	✓						✓	✓		✓	✓		✓	✓	✓	✓	✓		✓	✓		
Logician Internet (ASP)	✓		✓				✓				✓			✓															✓		
NextGen (ASP)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓			✓	✓		
Physician Practice Solution (ASP)	✓	✓	✓	✓	✓		✓	✓		✓		✓		✓	✓	✓		✓		✓			✓	✓	✓			✓	✓	✓	
topsChart (ASP)	✓	✓	✓	✓	✓			✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	

Top table

Section headers: **Chronic disease / medications** · **Health and functional status** · **Clinical variable control charting** · **Decision support – expert systems** · **Decision support – guidelines and literature**

Column headers (left to right):

1. Tracks screening results
2. Reminders for providers
3. Services tracked
4. Algorithms available
5. Modifiable for practice
6. Modifiable for patient
7. Tracks provider exclusions
8. Tracks patient exclusions
9. Reminders for providers
10. Health status tracked
11. Reminders for providers
12. Functional status tracked
13. Reminders for providers
14. Time series graphs
15. Growth charts
16. Plots of X against Y
17. Statistical control charts
18. Interface with expert system
19. Expert system linked to patient data
20. Usable in real time: patient
21. Usable in real time: group
22. Integrated with Browser
23. AHRQ Clinical Guidelines
24. National Guideline Clearinghouse
25. USPSTF Guidelines
26. NIH Consensus Guidelines
27. Other guidelines
28. "MEDLINE" etc."
29. Full-text resources
30. Link w/o redundant entry: patient
31. Link w/o redundant entry: group

Bottom table

Section headers: *Consultations* · **Documentation tools** · **Administrative reports, CQI and COPC** (Administrative data, UR & CQI / Research & COPC) · **Patient features** (**Reminders** / **Access to information** / **Educational resources**)

Column headers (left to right):

1. Consultant list by specialty
2. Insurance coverage
3. Note templates
4. Pick lists
5. Merge existing data
6. Genograms
7. Drawing templates
8. Authentication by electronic signature
9. Patient population profiles
10. Patient satisfaction tracking
11. Productivity tracking
12. Utilization tracking
13. Regular reports
14. Protocol-adherence tracking
15. Comparative reports
16. Statistical control charts
17. Query functions and report generator
18. Mail merge
19. Export data for analysis
20. Simple searches in < 1 minute
21. Complex report in < 30 minutes
22. Save and rerun reports
23. Appointment reminders
24. Reminders based on plan
25. Reminders based on protocols
26. Preventive services reminders
27. Reminders by phone
28. Practice-controlled patient access
29. Access at practice location
30. Access by home computer
31. Access by telephone
32. Patient education materials
33. Printable patient information
34. List of materials in practice
35. Classes and groups
36. Patient access to Web
37. Clinical database linkage

All 28 systems have all three note-writing features we asked about, including pre-formatted templates, pick lists and the ability to insert pre-existing data into a note. Seven systems (six conventional systems and one ASP system) do not incorporate electronic signatures. Nine systems support both genograms and drawing templates, and nine systems support neither.

Administrative and quality reports. Twenty-two systems can compile patient profiles based on demographic data, disease states and other variables. Eleven track measures of patient satisfaction. Twenty report on provider productivity (e.g. patient volume) and 22 report on provider utilization of diagnostic tests, medications and consultations. Twenty-six products have at least one of the following capabilities: queries/reports, mail merge, data export for analysis, simple searches in less than 1 minute, complex reports in less than 30 minutes and the ability to save and rerun reports.

Overall. Conventional EMRs having the most complete functionality for health care providers include ChartWare, EpicCare, Health Probe and Logician. ASP EMRs having the most complete functionality for health care providers include NextGen and topsChart.

Patient functionality

The functions of the EMR systems that are of particular relevance to patients are presented in "Patient features of 28 EMR systems," page 53.

Appointment reminders. Twenty-one products produce patient reminders of scheduled appointments that are suitable for mailing. Six products do not offer any type of appointment reminder functions. Many products can produce mailable patient reminders to schedule follow-up appointments:

- Twenty-one can produce reminders based on previously designed treatment plans.
- Seventeen systems can produce reminders based on treatment protocols.
- Seventeen systems can automatically schedule patient appointments based on preventive services.

In addition, 13 can produce automatic telephone reminders for patients using computer-generated voice technology.

Access to information. This category clearly separates the ASP systems from the conventional systems. Fewer than half of the conventional systems allow patients access to their own personal medical records, either in the office or by remote means. Four out of the five ASP systems allow patient access. This is a "cutting-edge" feature of the new generation of EMRs.

Patient education. Twenty-four systems provide some type of patient education material — printed handouts, a bibliography or a list of classes and groups. Fourteen systems allow the patient access to Web-based patient information materials, and 14 allow linking of patient information to the clinical database in such a way that patients can be automatically informed of materials suitable for their conditions. Four systems do not provide any type of patient education materials, and four offer patient education in every form cited on the questionnaire.

Overall. Conventional EMRs having the most complete patient functionality include EpicCare and Logician. The ASP EMR having the most complete patient functionality was Clinical Works Module.

Ranking the systems

The chart on page 46 displays the composite ratings of all the EMR products. But be careful not to put more weight on our findings than they can bear, given the inherent limitations of the survey format. As we stated earlier in the article, we're presenting what vendors say about their own products — or rather, what they said in mid-2000. Based on these conditions and the findings of this survey, three conventional EMR systems received a rating of five stars: ChartWare, EpicCare and Health Probe. None of the ASP EMRs received an overall five-star rating, but four products did receive four-star ratings: Clinical Works Module, NextGen, Physician Practice Solution and topsChart.

If you're interested in purchasing an EMR system, we hope you'll use the results of this survey as one starting point for your investigation. Another resource to help you plan for implementation of a EMR system is the AAFP monograph *How to Select a Computer System for a Family Physician's Office* (www.aafp.org/fpnet/guide). Other resources include previously published *FPM* articles and the AAFP's EMR e-mail mailing list (to subscribe to the e-mail list, send an e-mail request with your name, e-mail address and AAFP ID number (if applicable) to Susan Rehm, at srehm@aafp.org).

A "one size fits all" EMR system does not exist. But with careful research, planning and implementation, an EMR system can make your life much easier and help you provide better care for your patients. Good luck. **FPM**

Three systems received our highest rating.