

Becoming a Digital Office

Chapter FastFACTS

- 1. Newer EHR systems provide guidance based on clinical guidelines and measure quality as part of the workflow.**
- 2. EHRs may make it easier to document e-mail than telephone communication with patients.**
- 3. Patients like having a virtual communication option with their physicians, such as e-mail communication, video, or real-time chats.**
- 4. Some companies act as intermediaries for virtual visits, verifying and delivering patient requests to physicians.**
- 5. Ensuring the privacy of e-mail and Web-based communication includes providing a secure patient portal as well as secure Websites and Web-based communication.**

How do you identify your diabetes patients in your patient record system? When Karim Keshavjee, MD, CEO of InfoClin, a Toronto-based health information management consulting company, led a workshop recently, he asked 12 physicians from the same practice that question. Their answers included “DM,” “diabetes mellitus,” and “NIDDM”—among others. “There were 12 doctors and there were six different terms they used for the same thing,” Dr. Keshavjee recalls.

By not having an agreed-upon naming standard, the practice’s EHR system couldn’t work properly. In order to identify and track patient populations, such as those with diabetes, systems must be programmed to attach specific terms to specific dis-

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I have type 2 diabetes. This is...

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Model is for illustrative purposes only.

Indications and usage

Levemir® is indicated for once- or twice-daily subcutaneous administration for the treatment of adult and pediatric patients with type 1 diabetes mellitus or adult patients with type 2 diabetes mellitus who require basal (long-acting) insulin for the control of hyperglycemia.

Important safety information

Levemir® is contraindicated in patients hypersensitive to insulin detemir or one of its excipients.

Hypoglycemia is the most common adverse effect of all insulin therapies, including Levemir®. As with other insulins, the timing of hypoglycemic events may differ among various insulin preparations. Glucose monitoring is recommended for all patients with diabetes. Levemir® is not to be used in insulin infusion pumps. Any change of insulin dose should be made cautiously and only under medical supervision. Concomitant oral antidiabetes treatment may require adjustment.

Inadequate dosing or discontinuation of treatment may lead to hyperglycemia and, in patients with type 1 diabetes, diabetic ketoacidosis. Levemir® should not be diluted or mixed with

any other insulin preparations. Insulin may cause sodium retention and edema, particularly if previously poor metabolic control is improved by intensified insulin therapy. Dose and timing of administration may need to be adjusted to reduce the risk of hypoglycemia in patients being switched to Levemir® from other intermediate or long-acting insulin preparations. The dose of Levemir® may need to be adjusted in patients with renal or hepatic impairment.

Other adverse events commonly associated with insulin therapy may include injection site reactions (on average, 3% to 4% of patients in clinical trials) such as lipodystrophy, redness, pain, itching, hives, swelling, and inflammation.

*Whether these observed differences represent true differences in the effects of Levemir®, NPH insulin, and insulin glargine is not known, since these trials were not blinded and the protocols (eg, diet and exercise instructions and monitoring) were not specifically directed at exploring hypotheses related to weight effects of the treatments compared. The clinical significance of the observed differences in weight has not been established.

For your patients with type 2 diabetes,
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Levemir® helps patients with diabetes achieve their A1C goal.^{2,3}

- 24-hour action at a once-daily dose^{4,5}
- Provides consistent insulin absorption and action, day after day^{4,6,7}
- Less weight gain^{8*}

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References: 1. Data on file. Novo Nordisk Inc, Princeton, NJ. 2. Meneghini LF, Rosenberg KH, Koenen C, Meriläinen MJ, Lüddeke H-J. Insulin detemir improves glycaemic control with less hypoglycaemia and no weight gain in patients with type 2 diabetes who were insulin naive or treated with NPH or insulin glargine: clinical practice experience from a German subgroup of the PREDICTIVE study. *Diabetes Obes Metab.* 2007;9(3):418-427. 3. Hermansen K, Davies M, Derezinski T, Ravn GM, Clauson P, Home P, for the Levemir Treat-to-Target Study Group. A 26-week, randomized, parallel, treat-to-target trial comparing insulin detemir with NPH insulin as add-on therapy to oral glucose-lowering drugs in insulin-naive people with type 2 diabetes. *Diabetes Care.* 2006;29(6):1269-1274. 4. Klein O, Lyngé J, Endahl L, Damholt B, Nosek L, Heise T. Albumin-bound basal insulin analogues (insulin detemir and NN344): comparable time-action profiles but less variability than insulin glargine in type 2 diabetes. *Diabetes Obes Metab.* 2007;9(3):290-299. 5. Philit-Tsimikas A, Charpentier G, Clauson P, Ravn GM, Roberts VL, Thorsteinsson B. Comparison of once-daily insulin detemir with NPH insulin added to a regimen of oral antidiabetic drugs in poorly controlled type 2 diabetes. *Clin Ther.* 2006;28(10):1569-1581. 6. Danne T, Endahl L, Haahr H, et al. Lower within-subject variability in pharmacokinetic profiles of insulin detemir in comparison to insulin glargine in children and adolescents with type 1 diabetes. Presented at: 43rd Annual Meeting of the European Association for the Study of Diabetes; September 17-21, 2007; Amsterdam, Netherlands. Abstract O189. 7. Heise T, Nosek L, Ravn BB, et al. Lower within-subject variability of insulin detemir in comparison to NPH insulin and insulin glargine in people with type 1 diabetes. *Diabetes.* 2004;53(6):1614-1620. 8. Data on file. NDA21-536. Novo Nordisk Inc, Princeton, NJ.



Levemir®

insulin detemir (rDNA origin) injection



Please see brief summary of Prescribing Information on adjacent page.

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Levemir®

insulin detemir (rDNA origin) injection

Rx ONLY

BRIEF SUMMARY. Please see package insert for prescribing information.

INDICATIONS AND USAGE

LEVEMIR is indicated for once- or twice-daily subcutaneous administration for the treatment of adult and pediatric patients with type 1 diabetes mellitus or adult patients with type 2 diabetes mellitus who require basal (long acting) insulin for the control of hyperglycemia.

CONTRAINDICATIONS

LEVEMIR is contraindicated in patients hypersensitive to insulin detemir or one of its excipients.

WARNINGS

Hyperglycemia is the most common adverse effect of insulin therapy, including LEVEMIR. As with all insulins, the timing of hyperglycemia may differ among various insulin formulations.

Glucose monitoring is recommended for all patients with diabetes.

LEVEMIR is not to be used in insulin infusion pumps.

Any change of insulin dose should be made cautiously and only under medical supervision. Changes in insulin strength, timing of dosing, manufacturer, type (e.g., regular, NPH, or insulin analogs), species (animal, human), or method of manufacture (rDNA versus animal-source insulin) may result in the need for a change in dosage. Concomitant oral antidiabetic treatment may need to be adjusted.

PRECAUTIONS

General

Inadequate dosing or discontinuation of treatment may lead to hyperglycemia and, in patients with type 1 diabetes, diabetic ketoacidosis. The first symptoms of hyperglycemia usually occur gradually over a period of hours or days. They include nausea, vomiting, drowsiness, flushed dry skin, dry mouth, increased urination, thirst and loss of appetite as well as acetone breath. Untreated hyperglycemic events are potentially fatal.

LEVEMIR is not intended for intravenous or intramuscular administration. The prolonged duration of activity of insulin detemir is dependent on injection into subcutaneous tissue. Intravenous administration of the usual subcutaneous dose could result in severe hypoglycemia. Absorption after intramuscular administration is both faster and more extensive than absorption after subcutaneous administration.

LEVEMIR should not be diluted or mixed with any other insulin preparations (see PRECAUTIONS, Mixing of Insulins).

Insulin may cause sodium retention and edema, particularly if previously poor metabolic control is improved by intensified insulin therapy.

Lipodystrophy and hypersensitivity are among potential clinical adverse effects associated with the use of all insulins.

As with all insulin preparations, the time course of LEVEMIR action may vary in different individuals or at different times in the same individual and is dependent on site of injection, blood supply, temperature, and physical activity.

Adjustment of dosage of any insulin may be necessary if patients change their physical activity or their usual meal plan.

Hypoglycemia

As with all insulin preparations, hypoglycemic reactions may be associated with the administration of LEVEMIR. Hypoglycemia is the most common adverse effect of insulins. Early warning symptoms of hypoglycemia may be different or less pronounced under certain conditions, such as long duration of diabetes, diabetic nerve disease, use of medications such as beta-blockers, or intensified diabetes control (see PRECAUTIONS, Drug Interactions).

Such situations may result in severe hypoglycemia (and, possibly, loss of consciousness) prior to patients' awareness of hypoglycemia.

The time of occurrence of hypoglycemia depends on the action profile of the insulins used and may, therefore, change when the treatment regimen or timing of dosing is changed. In patients being switched from other intermediate or long-acting insulin preparations to once- or twice-daily LEVEMIR, dosages can be prescribed on a unit-to-unit basis; however, as with all insulin preparations, dose and timing of administration may need to be adjusted to reduce the risk of hypoglycemia.

Renal Impairment

As with other insulins, the requirements for LEVEMIR may need to be adjusted in patients with renal impairment.

Hepatic Impairment

As with other insulins, the requirements for LEVEMIR may need to be adjusted in patients with hepatic impairment.

Injection Site and Allergic Reactions

As with any insulin therapy, lipodystrophy may occur at the injection site and delay insulin absorption. Other injection site reactions with insulin therapy may include redness, pain, itching, hives, swelling, and inflammation. Continuous rotation of the injection site within a given area may help to reduce or prevent these reactions. Reactions usually resolve in a few days to a few weeks. On rare occasions, injection site reactions may require discontinuation of LEVEMIR.

In some instances, these reactions may be related to factors other than insulin, such as irritants in a skin cleansing agent or poor injection technique.

Systemic allergy: Generalized allergy to insulin, which is less common but potentially more serious, may cause rash (including pruritus) over the whole body, shortness of breath, wheezing, reduction in blood pressure, rapid pulse, or sweating. Severe cases of generalized allergy, including anaphylactic reaction, may be life-threatening.

Intercurrent Conditions

Insulin requirements may be altered during intercurrent conditions such as illness, emotional disturbances, or other stresses.

Information for Patients

LEVEMIR must only be used if the solution appears clear and colorless with no visible particles. Patients should be informed about potential risks and advantages of LEVEMIR therapy, including the possible side effects. Patients should be offered continued education and advice on insulin therapies, injection technique, life-style management, regular glucose monitoring, periodic glycosylated hemoglobin testing, recognition and management of hypo- and hyperglycemia, adherence to meal planning, complications of insulin therapy, timing of dosage, instruction for use of injection devices and proper storage of insulin. Patients should be informed that frequent, patient-performed blood glucose measurements are needed to achieve effective glycemic control to avoid both hyperglycemia and hypoglycemia. Patients must be instructed on handling of special situations such as intercurrent conditions (illness, stress, or emotional disturbances), an inadequate or skipped insulin dose, inadvertent administration of an increased insulin dose, inadequate food intake, or skipped meals. Refer patients to the LEVEMIR "Patient Information" circular for additional information.

As with all patients who have diabetes, the ability to concentrate and/or react may be impaired as a result of hypoglycemia or hyperglycemia.

Patients with diabetes should be advised to inform their health care professional if they are pregnant or are contemplating pregnancy (see PRECAUTIONS, Pregnancy).

Laboratory Tests

As with all insulin therapy, the therapeutic response to LEVEMIR should be monitored by periodic blood glucose tests. Periodic measurement of HbA_{1c} is recommended for the monitoring of long-term glycemic control.

Drug Interactions

A number of substances affect glucose metabolism and may require insulin dose adjustment and particularly close monitoring.

The following are examples of substances that may reduce

the blood-glucose-lowering effect of insulin: corticosteroids, danazol, diuretics, sympathomimetic agents (e.g., epinephrine, albuterol, terbutaline), isoniazid, phenothiazine derivatives, somatropin, thyroid hormones, estrogens, progestogens (e.g., in oral contraceptives).

The following are examples of substances that may increase the blood-glucose-lowering effect of insulin and susceptibility to hypoglycemia: oral antidiabetic drugs, ACE inhibitors, disopyramide, fibrates, fluoxetine, MAO inhibitors, propoxyphene, salicylates, somatostatin analog (e.g., octreotide), and sulfonamide antibiotics.

Beta-blockers, clonidine, lithium salts, and alcohol may either potentiate or weaken the blood-glucose-lowering effect of insulin. Pentamidine may cause hypoglycemia, which may sometimes be followed by hyperglycemia. In addition, under the influence of sympatholytic medicinal products such as beta-blockers, clonidine, guanethidine, and reserpine, the signs of hypoglycemia may be reduced or absent.

The results of *in-vitro* and *in-vivo* protein binding studies demonstrate that there is no clinically relevant interaction between insulin detemir and fatty acids or other protein bound drugs.

Mixing of Insulins

If LEVEMIR is mixed with other insulin preparations, the profile of action of one or both individual components may change. Mixing LEVEMIR with insulin aspart, a rapid acting insulin analog, resulted in about 40% reduction in AUC_(0-2h) and C_{max} for insulin aspart compared to separate injections when the ratio of insulin aspart to LEVEMIR was less than 50%.

LEVEMIR should NOT be mixed or diluted with any other insulin preparations.

Carcinogenicity, Mutagenicity, Impairment of Fertility

Standard 2-year carcinogenicity studies in animals have not been performed. Insulin detemir tested negative for genotoxic potential in the *in-vitro* reverse mutation study in bacteria, human peripheral blood lymphocyte chromosome aberration test, and the *in-vivo* mouse micronucleus test.

Pregnancy: Teratogenic Effects: Pregnancy Category C

In a fertility and embryonic development study, insulin detemir was administered to female rats before mating, during mating, and throughout pregnancy at doses up to 300 nmol/kg/day (3 times the recommended human dose, based on plasma Area Under the Curve (AUC) ratio). Doses of 150 and 300 nmol/kg/day produced numbers of litters with visceral anomalies. Doses up to 900 nmol/kg/day (approximately 135 times the recommended human dose based on AUC ratio) were given to rabbits during organogenesis. Drug-dose related increases in the incidence of fetuses with gall bladder abnormalities such as small, bilobed, bifurcated and missing gall bladders were observed at a dose of 900 nmol/kg/day. The rat and rabbit embryofetal development studies that included concurrent human insulin control groups indicated that insulin detemir and human insulin had similar effects regarding embryotoxicity and teratogenicity.

Nursing mothers

It is unknown whether LEVEMIR is excreted in significant amounts in human milk. For this reason, caution should be exercised when LEVEMIR is administered to a nursing mother. Patients with diabetes who are lactating may require adjustments in insulin dose, meal plan, or both.

Pediatric use

In a controlled clinical study, HbA_{1c} concentrations and rates of hypoglycemia were similar among patients treated with LEVEMIR and patients treated with NPH human insulin.

Geriatric use

Of the total number of subjects in intermediate and long-term clinical studies of LEVEMIR, 85 (type 1 studies) and 363 (type 2 studies) were 65 years and older. No overall differences in safety or effectiveness were observed between these subjects and younger subjects, and other reported clinical experience has not identified differences in responses between the elderly and younger patients, but greater sensitivity of some older individuals cannot be ruled out. In elderly patients with diabetes, the initial dosing, dose increments, and maintenance dosage should be conservative to avoid hypoglycemic reactions. Hypoglycemia may be difficult to recognize in the elderly.

ADVERSE REACTIONS

Adverse events commonly associated with human insulin therapy include the following:

Body as Whole: allergic reactions (see PRECAUTIONS, Allergy).

Skin and Appendages: lipodystrophy, pruritus, rash. Mild injection site reactions occurred more frequently with LEVEMIR than with NPH human insulin and usually resolved in a few days to a few weeks (see PRECAUTIONS, Allergy).

Other:

Hypoglycemia: (see WARNINGS and PRECAUTIONS).

In trials of up to 6 months duration in patients with type 1 and type 2 diabetes, the incidence of severe hypoglycemia with LEVEMIR was comparable to the incidence with NPH, and, as expected, greater overall in patients with type 1 diabetes (Table 4).

Weight gain:

In trials of up to 6 months duration in patients with type 1 and type 2 diabetes, LEVEMIR was associated with somewhat less weight gain than NPH (Table 4). Whether these observed differences represent true differences in the effects of LEVEMIR and NPH insulin is not known, since these trials were not blinded and the protocols (e.g., diet and exercise instructions and monitoring) were not specifically directed at exploring hypotheses related to weight effects of the treatments compared. The clinical significance of the observed differences has not been established.

Table 4: Safety Information on Clinical Studies

Treatment	# of subjects	Weight (kg)		Hypoglycemia (events/subject/month)		
		Baseline	End of treatment	Major*	Minor**	
Type 1						
Study A	LEVEMIR	N=276	75.0	75.1	0.045	2.184
	NPH	N=133	75.7	76.4	0.035	3.063
Study C	LEVEMIR	N=492	76.5	76.3	0.029	2.397
	NPH	N=257	76.1	76.5	0.027	2.564
Study D	LEVEMIR	N=232	N/A	N/A	0.076	2.677
	Pediatric NPH	N=115	N/A	N/A	0.083	3.203
Type 2						
Study E	LEVEMIR	N=237	82.7	83.7	0.001	0.306
	NPH	N=239	82.4	85.2	0.006	0.595
Study F	LEVEMIR	N=195	81.8	82.3	0.003	0.193
	NPH	N=200	79.6	80.9	0.006	0.235

* Major = requires assistance of another individual because of neurologic impairment

** Minor = plasma glucose <56 mg/dL, subject able to deal with the episode him/herself

OVERDOSAGE

Hypoglycemia may occur as a result of an excess of insulin relative to food intake, energy expenditure, or both. Mild episodes of hypoglycemia usually can be treated with oral glucose. Adjustments in drug dosage, meal patterns, or exercise may be needed. More severe episodes with coma, seizure, or neurologic impairment may be treated with intramuscular/subcutaneous glucagon or concentrated intravenous glucose. After apparent clinical recovery from hypoglycemia, continued observation and additional carbohydrate intake may be necessary to avoid recurrence of hypoglycemia.

More detailed information is available on request.

Rx only

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eases. For example, the system could provide appropriate reminders and recommend educational materials for all patients coded as “DM.” The doctor then could track the progress of these patients as a group by using the same code to determine, for example, whether the office was meeting quality improvement goals for the percentage of patients receiving recom-



“The [electronic] chart looks like a big e-mail inbox with each document on a line telling you what it is. Any document can be attached to an e-mail, so if a patient wants tests or results or an actual scan, it’s one click and they can open it, print it, and take it to a specialist.”

Richard J. Baron, MD

Greenhouse Internists, Philadelphia

mended foot exams. As a result, the practice was inadvertently letting care for many patients with diabetes fall through the cracks. “The alerts and reminders were not popping up in half of the cases because patients weren’t being identified in the system,” Dr. Keshavjee says.

It’s not unusual to find practices underusing their systems by just using them as databases to enter and retrieve information and failing to take advantage of their sophisticated information management capabilities, such as population tracking, says Dr. Keshavjee, a family physician. Consequently, it often appears that EHRs are not living up to the promise of producing better patient care and outcomes when the real issue is that physicians are not making changes in the way they manage patient information.

While the transition from paper to computerized records can be frustrating even for technologically savvy physicians, all providers soon begin to appreciate the benefits, such as “the ability to review charts at home rather than having to come into the office to [do so],” says Dr. Keshavjee, who advises more than 200 physicians on using EHRs. Another advantage, he says, are “reminders that give you that extra little nudge you need, especially when a patient is complicated.”

Being able to look at and use information differently—for example, tracking your patient populations to improve quality—will not only fulfill the promise of EHRs, but also help you create a cutting-edge “digital office” that can better meet your patients’ needs. This chapter will show how to maximize the use of your EHR as well as other ways that being a digital office can enhance patient care and communication, including e-mail consultations, secure Web portals, interactive Websites, and other tools. The chapter will also examine security and privacy issues.

Going for ‘A New Digital Paradigm’

It’s one thing to make the effort to get the right system for your practice; it’s another to use information differently. In a study that Dr. Keshavjee presented at a 2007 e-health conference, researchers analyzed technology use among 112 family physicians in small practices that had had EHRs for seven years. The researchers found that 35% of the physicians were not using their EHRs, and 60% of those who were using their EHRs were maintaining duplicate paper processes. Dr. Keshavjee, who co-authored the study, concluded that many practices taking the first step from paper to electronic records are struggling to make the transition from passive record keeping on individual patients to pro-active management of patient populations.

“They need a new digital paradigm,” Dr. Keshavjee says. He works with primary care practices to achieve that goal by helping physicians understand how to transition from managing documents—the focus of a paper-based system—to managing information, which allows physicians to track populations.

Harnessing the power of EHRs requires a change in the way physicians think about patient care. “Paper files are great for dealing with one patient, but they can’t help me find all the information about a particular kind of patient,” he notes. Once you have that information, you can, for example, identify all of your patients with diabetes or heart disease and track them to make sure they are getting appropriate care at the right time.



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Technologically savvy practices are also going beyond pop-up alerts and reminders with their clinical support systems, says ACP's Dr. Barr. Newer systems provide content-sensitive guid-



“We use [virtual visits] for acute problems such as nausea, vomiting, or skin rash.”

Susan R. Miller, RN
Administrator

Family Practice Associates, Lexington, Ky.

ance based on clinical guidelines, he explains. “EHRs need to measure quality as part of the workflow. If I’m completing a note on someone, the EHR should be compiling information I will need to reflect back to me on how I’m doing on quality measures,” he says. “That same process should allow me to report those measures externally, and the guideline driving those measures should be in the back informing the clinical-decision support to inform my conversations with patients.”

Charles S. Burger, MD, an internist with Martin’s Point Health Care in Bangor, Me., says that using clinical-decision support tools “lets our whole staff move up a level.” For example, a triage tool allows the practice’s patient service representatives to better prioritize calls and treat acute minor illnesses, such as urinary tract infections, he explains. “That unloads a lot of work from [the physicians],” he says.

EHRs can offer additional services that help physicians at the point-of-care. For example, the LDM Group (www.ldmgrp.com) partners with EHR and e-prescription companies to provide ScriptGuide, which delivers messages to patients at the time the prescription is being written. The LDM Group works with pharmaceutical companies to provide relevant information on common conditions, such as hypertension, asthma, or depression. The idea is that reinforcing the physician’s instructions and having access to related resources will make patients more likely to adhere to their prescriptions.

“It is staggering to think that across a variety of chronic therapies one-in-three prescriptions may go unfilled,” said Michael Nissenbaum, CEO, Aprima Medical Software, Inc., a developer of EHR and practice management systems. “This lack of compliance creates unnecessary costs within the healthcare industry. Through LDM’s ScriptGuide solution we are providing results for the patient, physician, and healthcare industry as a whole. Our clients—healthcare professionals—can experience improved compliance rates 8% on average and as high as 19% in some therapeutic categories.”

Virtual Visits

Although some physicians worry that answering patient e-mails will take up too much time, physicians at Greenhouse Internists in Philadelphia have found that doing so can be easier than trying to communicate with patients by telephone.

“In our experience, e-mail is easier to handle,” Dr. Baron says, explaining that the practice’s e-mail is fully integrated with its EHR system. “On the phone, I have to document both sides of the conversation whereas with e-mail, patients document their half; and it goes directly into the record.” He says the system has vastly improved communication with patients as well as patients’ access to their own health information.

Physicians at the practice can also electronically sign forms, such as a prescription for a mammogram, saving the office the cost of mailing and saving patients a trip to the office. “The [electronic] chart looks like a big e-mail inbox with each document on a line telling you what it is,” Dr. Baron explains. “Any document can be attached to an e-mail, so if a patient wants tests or results or an actual scan, it’s one click and they can open it, print it, and take it to a specialist.”

Recent research suggests that patients like having a virtual option, which can expand from e-mail communication to include video or even real-time chats. In a study that compared desktop videoconferencing to conventional face-to-face visits for common problems in general practice, 175 patients gave similar ratings to virtual and face-to-face visits. Patients were asked to rate the visits according to time spent with physician, ease of interaction, and personal aspects of the interaction. The study, pub-

lished in the May 2009 *Journal of Telemedicine and Telecare*, concluded that virtual visits are a viable alternative for accessing primary care services.

Doctors are getting the message. Almost 40% of physicians are currently communicating with patients online via e-mail, instant messaging, or secure messaging systems, up from 16% in 2004, according to Manhattan Research, a market research and advisory firm. Physician-patient online interaction has doubled since 2003—growth that can be attributed to the prevalence of e-mail as a communication channel and the fact that physicians are spending a larger portion of their workday online, according to Manhattan Research’s “Taking the Pulse 2009.”

Web Portal or Office Visit?

Of course, Web visits are only appropriate for certain types of complaints. It makes sense, for example, to treat simple conditions such as infections or flu symptoms via a secure Web portal, while requiring patients to come into the office if they report more serious symptoms such as chest pain. In addition, some state medical boards require that physicians see patients in order to prescribe medications.

Family Practice Associates of Lexington, Ky., clearly informs patients that virtual visits should be used for non-urgent symptoms only. “We use it for acute problems such as nausea, vomiting, or skin rash,” says Susan R. Miller, RN, administrator for the 11-physician practice. Because the virtual visit is meant to treat simple problems, the practice charges \$20 for it. But if the problem can’t be treated online, the patient is asked to make an office appointment.

Some companies, such as RelayHealth and Medfusion, act as intermediaries for virtual visits, authenticating and delivering patient requests to physicians, and handling fees charged to patients or insurers. An increasing number of insurers will reimburse physicians who use these services for Web consultations. Medicare does not specifically cover electronic consultations, although physicians can account for time spent on e-mail when determining the level of evaluation and management service to bill for a related face-to-face visit.

In a document guiding patients on the appropriate use of e-

mail, the Canadian Medical Association lists the following “approved uses” for using e-mail to communicate with their physicians:

- Request prescription refills
- Clarify or confirm doctor’s instructions
- Receive test results
- Learn how to prepare for tests and procedures
- Ask questions prior to a medical procedure
- Get post-procedure instructions
- Ask questions about a condition you have already discussed with the doctor in person
- Ask questions about a new condition or symptom
- At the doctor’s request, provide basic medical history to be reviewed at your next appointment

Cutting-edge practices are going a step further by offering real-time virtual visits using video or live chat. OptumHealth, part of insurer UnitedHealth Group, recently announced that it would begin offering a service called NowClinic nationwide. The service allows patients and doctors to communicate by video chat, using technology created by American Well Corp. UnitedHealth offers a free video tour that goes through the steps for enrolling, using, and getting paid for using NowClinic at www.nowclinic.com.

Interactive Websites

When Family Practice Associates invited patients to sign up for its new secure patient portal in July 2009, thousands of responses poured in; as of February 2010, 7,700 patient accounts had been set up.

Patients who log onto the practice’s Website can view their personal record, request appointments or prescription renewals,

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download or update health forms, or pay their bills. The site also offers access to the AAFP's self-care charts and handouts, educational videos on various diseases and health issues, and profiles of staff physicians.

"We wanted to understand more about our patients and what their problems were," Ms. Miller says. "We wanted to go to the next level in being proactive in our care."

An ideal Web portal, according to the Ambulatory Practice of the Future model, allows patients to create or update a shared care plan online with their providers and share personal information that isn't always included on standard medical forms, such as dietary restrictions or family information. The portal should also allow patients to do the following:

- Schedule appointments, send e-mail, request refills, and receive updates from their physicians;
- Meet with their care team online through video chats and instant messaging;
- Have unrestricted access to their personal records including visit notes, lab test results, and medication information;
- Compare and track their health data and test results over time, and
- View and manage medication lists.

To find companies that can help you establish a Website and more, see "Setting Up Your Website, Virtual Visits, and E-mail," opposite.

Ensuring Privacy and Security

Your transition to an electronic environment must include ensuring the privacy of e-mail and Web-based communication, as required by HIPAA. For more information, see "Checking up on Privacy and Security," p. 60.

For example, Greenhouse Internists maintains a secure patient portal on its Website so that communication between patient and doctor never goes out across the Internet. When patients e-mail a doctor, they get a reply telling them that a message is waiting for them on the secure site. One click takes them to the secure server, where they sign in before viewing the doctor's message.

Physicians can choose from an array of encryption options in order to ensure that e-mail communications are secure, from

Setting Up Your Website, Virtual Visits, and E-mail

Many firms offer help with setting up and maintaining medical Websites and facilitating virtual visits or secure e-mail. A few are listed below.

- AmericanWell Corp.: www.americanwell.com
- DocInTouch: <https://www.fcrintouch.com/>
- MD email.net: www.mdemail.net
- Medfusion: www.medfusion.net
- RelayHealth: www.relayhealth.com

password-protected files to secure Web messaging and Websites. The AHRQ offers a guide to the various kinds of encryption, which vary according to how much security you want (a higher “bit” number equals more security) and cost. Password-protected files are the cheapest option but not very efficient because the patient often has to have certain software in order to respond securely. A similar option is public key infrastructure, or PKI, which requires an exchange of “keys” between sender and recipient, and can become an administrative burden.

More common are newer technologies that use network software or Web-based transmission. These include the following:

Secure Web-based messaging: Install software or hardware on a network or hire an ASP to transmit data over a secure Web platform. The patient receives a link to your Website and may be required to log on with a password in order to access data and respond. This is a reasonably priced option for small practices.

Secure Websites: A secure Web server and software are used to allow patients to view password-protected confidential information on a practice Website. This is similar to technology used to view bank statements or make purchases online.

Secure wireless: Hardware is installed on the network and remote devices, such as laptops, to communicate with a wireless server. Wireless encryption software secures data transmitted between the laptop and the wireless server on the organization’s network.

Practices that engage in virtual visits also should have policies that govern how e-mail communications should be initiated and conducted. Yale University offers an example of guidance that might be provided to physicians on the use of e-mail con-

Checking Up on Privacy and Security

AHRQ Health IT Tools includes a privacy and security collaboration tool kit.

http://healthit.ahrq.gov/portal/server.pt?open=512&objID=919&parentname=CommunityPage&parentid=5&mode=2&in_hi_userid=3882&cached=true

American Health Information Management Association offers a privacy and security section.

<http://www.ahima.org/emerging%5Fissues/PrivacyandSecurity.asp>

Healthcare Information Management Systems Society has a privacy and security resource section.

http://www.himss.org/ASP/topics_privacy.asp

HHS has a page on health information privacy.

<http://www.hhs.gov/ocr/privacy/>

taining personal health information. On the issue of e-mail between patients and physicians, the policy states the following:

Either the patient or the provider can initiate the e-mail contact; but to proceed, the patient must approve such electronic communications in the context of other options—such as phone or fax—and provide informed consent to the electronic message exchange by an acknowledgement or completing an “Agreement for e-mail Communication.” As with a phone- or fax-based consultation, the provider must maintain documentation of that informed consent and consider the nature of the transaction and, if appropriate, add suitable notes to the patient’s medical record.

While a patient may request electronic communication, the provider is not obligated to respond electronically, and such response must be conducted with care: If the provider has any concerns about the legitimacy of the e-mail query or the identity of the e-mail correspondent, the provider must seek additional identifying information or refer the patient to a phone or in-person consultation.

The e-personal health information in any such communication must be the minimum necessary; and in no event may the communication include highly sensitive information, such as that relating to HIV/AIDS, mental health, or substance abuse.

In addition to these policies, you should also take specific pre-

cautions when it comes to liability issues. For more information, see “Liability and Your Website,” below.

Other Electronic Tools

Doctors and patients are increasingly using cell phones and other mobile devices to boost efficiency and improve care to the point where a new term has been coined to describe accessing and exchanging health information via mobile devices: mHealth.

According to a 2009 report sponsored by the California Healthcare Foundation, mobile technology is transforming

Liability and Your Website

Sensitive issues can arise when deciding what to post on your practice’s Website. The Doctors Agency, a medical liability insurer, recommends considering the following when posting information:

- You are responsible for the information you put online.
- Advertising, promotions, or marketing materials might subject physicians to liability. Be wary of posting materials relating to cosmetic procedures, off-label drug use, and non-FDA-approved procedures.
- Post a disclaimer page between your Website and links to third-party Websites. Advise visitors that they are leaving your Website when they click on third-party links, and state that you are not responsible for the content of those Websites.

It’s also a good idea to include a “consent exchange” in any e-mail communication with patients in order to establish informed consent. Yale University provides the following example:

I will be happy to respond to your query; but in order for me to do so via e-mail, you must provide your consent, recognizing that e-mail is not a secure form of communication. There is some risk that any protected health information that may be contained in such e-mail may be disclosed to, or intercepted by, unauthorized third parties. I will use the minimum necessary amount of protected health information to respond to your query. If you wish to conduct this discussion via e-mail, please indicate your acceptance of this risk with your e-mail reply. Alternatively, please call my office to arrange a phone conversation or office visit.

chronic-care management. In the report, “Participatory Health: Online Mobile Tools Help Chronically Ill Manage Their Care,” health economist Jane Sarasohn-Kahn discusses how mHealth can improve care for patients with chronic illnesses:

The “Pill Phone” is a wireless application that allows people to look up drug interactions and schedule pill reminders on their phone. Similarly, personal health-record applications available at Apple’s iTunes Store can wirelessly transfer clinical readings and observations into patients’ EHRs.

Applications to improve medication compliance, links patients with their pharmacy and physician. A pharmacist packages the medication in a blister pack, which is loaded onto a medication delivery unit in the patient’s home. The unit, which operates via wireless, two-way, Web-based communications software, automatically identifies the medication and sends alerts to the patient. The unit also allows physicians to remotely manage prescriptions. Similarly, “smart phone” applications, such as eMedMobile, send alerts to caregivers when a medication is skipped.

Mobile tracking applications can help patients with diabetes keep track of medications, record observations, and share glucose test results with their physicians. Johnson & Johnson’s LifeScan unit, for example, combines a glucometer with the iPhone, which will automatically chart results, calculate sugar intake, and allow the user to adjust behaviors accordingly.

The increased use of mobile technology means you need to consider related risk-management issues. For details, see “Risk Management and Remote Access to Information,” opposite.

Support for virtual interactions is one of seven essential components needed to promote a “truly people-centered healthcare system,” say Aviv Shachak, PhD, and Alejandro R. Jadad, MD, DPhil, in “Electronic Health Records in the Age of Social Networks and Global Telecommunications,” published in the Feb. 3, 2010, issue of *The Journal of the American Medical Association*.

“With the rapid convergence of the Web with mobile telecommunication devices, it is now easy to embed resources in EHRs that could support exchanges of information by members of the public with healthcare professionals in a wide range of modalities,” the authors write. “Patients are increasingly expecting to access care from various locations at practically any time.”

Risk Management and Remote Access to Information

With the growing use of portable devices to enable offsite access, the HHS has issued specific guidance on what physicians must do to ensure security of health information when it is accessed via laptops, other mobile devices, or external hardware that is used to access protected health information. The guidance specifically includes laptops; home-based personal computers; PDAs and smart phones; hotel, library, or other public workstations and wireless access points; USB flash drives and memory cards; floppy disks; CDs; DVDs; backup media; e-mail; smart cards; and remote access devices (including security hardware). The guidance warns that, "In general, covered entities should be extremely cautious about allowing the offsite use of, or access to, information."

Some examples of appropriate use of remote access to patient information, according to HHS, are these:

- A home health nurse collecting and accessing patient data using a PDA or laptop during a home health visit
- A physician accessing an e-prescribing application on a PDA, while out of the office, to respond to patient requests for refills
- A health-plan employee transporting back-up enrollee data on a media storage device to an offsite facility

The policy also states that physicians and other covered entities must implement policies and procedures to ensure safe transmission of electronic protected health information (EPHI). Here's an example of a risk and possible preventative strategies:

Risk: Data intercepted or modified during transmission

Risk management strategy:

- Prohibit transmission of EPHI via open networks, such as the Internet, where appropriate.
- Prohibit the use of offsite devices or wireless access points (e.g., hotel workstations) for non-secure access to e-mail.
- Use more secure connections for e-mail via SSL and the use of message-level standards such as S/MIME, SET, PEM, PGP, etc.
- Implement and mandate appropriately strong encryption solutions for transmission of EPHI (e.g., SSL and HTTPS). SSL should be a minimum requirement for all Internet-facing systems that manage EPHI in any form, including corporate Web-mail systems.

For more information, go to www.hhs.gov/ocr/privacy/hipaa/administrative/securityrule/remotese.pdf