

## POLICY & PRACTICE

### Payment and Access to Imaging

Endocrinologists gained a powerful ally in the fight to stop impending cuts to the Medicare technical payments for in-office imaging services when the delegates to the American Medical Association's annual meeting voted in June to support the delay or repeal of the cuts. The Deficit Reduction Omnibus Reconciliation Act of 2005 (section 5102) calls for reducing the technical component payment, including the technical component of the global payment, for imaging services under the physician fee schedule if the service ex-

ceeds the hospital outpatient department payment amount under Medicare. These cuts are scheduled to take effect in January 2007 and would apply to imaging and computer-assisted imaging services, including x-rays, ultrasound, nuclear medicine, magnetic resonance imaging, computer tomography, and fluoroscopy. If the cuts go into effect, some physicians will be forced to discontinue providing in-office imaging services, which would, in turn, limit patient access and increase wait times for imaging, according to the AMA resolution. The resolution was introduced by

the American Association of Clinical Endocrinologists.

### Diabetes Patient Care Survey

Type 2 diabetes patients say they know a lot more about their disease than their physicians say they do, according to an online survey commissioned by the American Association of Diabetes Educators. The Harris Interactive survey of 784 adult type 2 patients and 406 primary care physicians who see at least three type 2 patients per month found that while 83% of patients who say they are on a healthy, balanced diet think they follow their health care provider's instructions on diet "well"

or "very well," only 29% of physicians believe this to be true of their type 2 patients. Also, 55% of patients surveyed didn't know their hemoglobin A<sub>1c</sub> level, have not had it checked in the past 6 months, or are unsure if they've had it tested, according to the survey. "The survey shows a glaring information gap between what patients think they know about self-management of their disease and what doctors think patients actually know," Dr. Sethu K. Reddy, chairman of the department of endocrinology, diabetes, and metabolism at the Cleveland Clinic, said at a press conference. The survey was sponsored by a grant from Merck & Co.

## 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

**Hypoglycemia is the most common adverse effect of insulin therapy, including LEVEMIR. As with all insulins, the timing of hypoglycemia 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<sub>1c</sub> 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<sub>(0-2h)</sub> and C<sub>max</sub> 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<sub>1c</sub> 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** |       |
| <b>Type 1</b> |               |             |                  |                                     |         |       |
| 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 |
|               | NPH           | N=115       | N/A              | N/A                                 | 0.083   | 3.203 |
| <b>Type 2</b> |               |             |                  |                                     |         |       |
| 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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### Smoking and Obesity: Bad Combo

The proportion of U.S. citizens who are both cigarette smokers and obese is higher among low-income populations, according to a study by Cheryl G. Heaton, Dr.P.H., of Columbia University and colleagues. The researchers used data from a national health interview survey of more than 29,000 adults to estimate how many people were both smokers and obese. They found that overall, 5.3% of men and 4.2% of women were both—about 9 million people altogether. "This proportion is higher in African Americans than in other racial or ethnic groups," the authors wrote. "A greater proportion of people with lower income and education levels smoke and are obese." The authors called for treatments to be developed to target this patient group. The study was funded by the American Legacy Foundation; Dr. Heaton is the group's president and CEO.

### Global Diabetes Campaign

The International Diabetes Federation has launched a global campaign to highlight the "alarming rise" of diabetes worldwide and encourage government support for a United Nations resolution on diabetes. The "Unite for Diabetes" campaign will try to get a resolution passed on or around World Diabetes Day on Nov. 14, 2007. "The number of people living with diabetes is expected to grow to 350 million in less than 20 years if action is not taken," the campaign noted in a press release. "If nothing is done, diabetes will place severe economic, social, and health burdens on the countries that can least afford it." Dr. Martin Silink, president-elect of the federation, noted that "The diabetes epidemic will overwhelm health care resources everywhere if governments do not wake up and take action now."

### Rapid Response Teams Cut Deaths

An 18-month campaign to get hospitals to adopt quality control measures has saved more than 100,000 lives. That's according to estimates by the Institute for Healthcare Improvement, the nonprofit organization behind the campaign. The IHI bases its estimates on raw mortality data from inpatient admissions only, which is submitted to the organization by participating hospitals. So far, at least 3,000 hospitals have signed up to participate. They agreed to implement some or all of a checklist of six quality improvement initiatives, including establishing rapid response teams that are activated when a patient's condition is deemed to be worsening.

—Joyce Frieden