

# Endoscopy Guidelines Benefit Diabetes Patients

*Recommendations target glucose control during the fasting period prior to the procedure itself.*

BY HANNAH BROWN  
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GLASGOW, SCOTLAND — Specific guidelines for patients with diabetes who have a scheduled endoscopy can help avoid an overnight hospital stay and also reduce complications, according to research presented at the Diabetes U.K. Annual Professional Conference.

The usual requirements for patients undergoing endoscopy include pre-procedure fasting and bowel preparation, which can make it difficult for diabetic patients to maintain good glucose control, putting them at risk of dysglycemia during or after the procedure. However, developments in the management of diabetes, including use of basal insulins, mean that there are now opportunities to help diabetic patients manage these difficult situations.

Recognizing the inadequacy of current endoscopy guidelines at her hospital, Dionne Wamae, a diabetes specialist nurse (DSN) at Worthing and Southlands Hospitals NHS Trust, Worthing, England, along with fellow DSN Alison McHoy, developed new recommendations to help diabetes patients prepare for endoscopies.

"Before we started our study, patients on insulin were being admitted overnight and the guidelines didn't take account of the many different types of insulin available," said Ms. Wamae. Furthermore, non-health professionals were frequently giving advice to patients before their procedures, and DSNs were giving varied, non-evidence-based advice, Ms. Wamae added.

Ms. Wamae and Ms. McHoy used literature searches, prescribing information for oral agents and insulins, and existing endoscopy guidelines to put together a set of 16 scenarios for management of patients with diabetes who are going to undergo endoscopy.

"Variations of the guidelines were developed to reflect the most common treatments, the type of procedure, and the time of day for which the patient was booked," said Ms. Wamae.

For example, one guideline gives advice for someone on a basal-bolus regimen who is scheduled to have an endoscopy in the afternoon. Depending on the specific formulation of treatment they are taking, patients should adhere to normal treatments on the day before the procedure and the following morning, eating and drinking as normal, but omit their lunchtime dose of rapid-acting insulin and take an additional rapid-acting insulin dose with the evening

meal after the procedure is complete. Another guideline describes what someone on oral agents for diabetes should do to prepare for a morning procedure. There are also additional recommendations included within the guidelines for monitoring of blood glucose.

There were no baseline standards available to see how diabetes patients fared on standard endoscopy guidelines. However, Ms. Wamae and Ms. McHoy did an audit to assess whether patients following the new guidelines successfully completed their planned procedures without an increase in the frequency of hypoglycemia or hyperglycemia.

The audit was undertaken for 16 weeks between November 2004 and March 2005, and included any adult with diabetes who was being treated with insulin or oral medication and who also was scheduled for an endoscopy or colonoscopy as an outpatient. The study sample included 40 patients.

During the course of the audit, the endoscopy department advised patients to call a DSN for advice 2 weeks prior to their procedure. The nurse instructed patients on how best to modulate their insulin or oral agent treatment in accordance with the new guidelines. Patients were then telephoned 5 days after they should have started their preprocedure preparation and asked about blood glucose control. In all, 68% of patients required preprocedure advice and 40% required advice on follow-up, but 32% asked for no advice at all.

According to Ms. Wamae, the audit showed that the guidelines worked well and improved the safety of patients. "Out of the 40 patients, none had an increase in number of hypoglycemic episodes, and some of the 12 patients who normally experience frequent hypoglycemia had fewer, possibly because of the benefits of having advice," she said. Two patients experienced an increase in hyperglycemic episodes from the day they began preparation for their endoscopy.

An important finding from the study was that patients were more anxious if their procedure was later in the day, especially if they were on insulin. "All patients treated with insulin should be first on the procedure list in the morning," said Ms. Wamae.

The guidelines are now hospital policy for both inpatient and outpatient endoscopies, and Ms. Wamae's colleagues at the hospital also have adapted them for day surgery procedures that normally take less than 1½ hours. "Feedback has been very positive," she said. ■

# Hyperglycemia, Hypertension Risk Factors for Diabetic Macular Edema

BY BRUCE K. DIXON  
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Patients with type 1 diabetes may be better protected from diabetic macular edema by improved control of glycemia, LDL cholesterol levels, and blood pressure, according to a 15-year follow-up study.

The prospective study was launched in 1990 with a cohort of 112 consecutive type 1 diabetes patients who did not have diabetic retinopathy or nephropathy at the time, according to Dr. Pedro Romero and colleagues at the Hospital Universitario Sant Joan de Reus, Universidad Rovira y Virgili, Spain.

"Our objective was to determine the epidemiological risk factors that influence the development of diabetic macular edema, in particular renal diabetic lesion (microalbuminuria or overt nephropathy)," according to Dr. Romero and colleagues.

The half-male, half-female cohort had a mean age of 40 years and a mean diabetes duration of 23.4 years. Arterial hypertension was present in 39% of patients.

Diabetic retinopathy was evaluated by photographs, through dilated pupils, of two 50-degree fields of each

eye centered. The results were then classified as mild nonproliferative, moderate proliferative, severe proliferative, and proliferative (*J. Diabetes Complications* 2007; 21:172-80).

Macular edema was considered present when retinal thickening involved or was within 500 μm of the center of the macula; when hard exudates were at or within 500 μm of the macula, if it was associated with a thickening of the adjacent retina (but no hard exudates remained after retinal thickening disappeared); and when the zone(s) of retinal thickening was (were) one disc area (or larger) in size, any part of which was within one disc diameter of the center of the macula.

The clinical classification used was the International Clinical Diabetic Retinopathy Disease Severity Scale, the investigators wrote.

After 15 years, one-half of the cohort had diabetic retinopathy (DR) and one-fifth of the cohort had diabetic macular edema (DME). More than half of those with DME had the focal type, a third were the diffuse form, and two patients had diffuse associated form to cystoid form (which is associated with diffuse form).

The mean visual acuity in patients with DME after 15 years was 0.31 in the Snellen chart test and 1.26 in the LogMAR test. The mean macular thickness was 356.21 μm.

Factors found to be significant to the development of DME included:

► High levels of glycated hemoglobin. Glycemic control was classified into two groups: hemoglobin A<sub>1c</sub> greater than 7.5% or less than 7.5% in concordance with the European Diabetes Policy Group. The value included in statistical analyses was the

mean of all values obtained over the trial period.

► High levels of LDL cholesterol as defined by the American Diabetes Association categories (3.35 mmol/L or higher). In contrast to previously published research, no lipid parameters were associated with the progression of diabetic retinopathy or with proliferative diabetic retinopathy after adjustment for glycated hemoglobin and other risk factors, the investigators explained.

► The presence of macroangiopathy. For this, one or more of the following had to be present: symptoms of angina pectoris, history of myocardial infarction, coronary artery bypass grafting, percutaneous transluminal coronary angioplasty, symptoms of or operation for intermittent claudication, history of amputation, transient ischemic attack, and stroke.

The authors maintained that this relationship between macroangiopathy and DME "may be explained, in part, by the increased incidence of macular edema with increased levels of lipids, which was strongly associated with the development of macroangiopathic lesions in" previous studies (*Br. J. Ophthalmol.* 2002;86:84-90; *Ophthalmology* 2002;109:1225-34).

► The presence of arterial hypertension, defined as a systolic measurement of 140 mm Hg or higher and a diastolic measurement of 90 mm Hg or higher.

This result contradicted an earlier finding from a 10-year study showing that the level of diastolic blood pressure was not a predictor in type 1 diabetes patients (*Arch. Ophthalmol.* 1995;113:601-6).

"However, a precedent study of that same group, at four years, found a positive relationship between diastolic blood pressure and the incidence of macular edema," Dr. Romero and colleagues wrote.

► The severity of diabetic retinopathy, a finding which confirms previous studies.

The researchers expressed surprise that the study found no association with cigarette smoking, although an earlier study also failed to link cigarette smoking with DME (*Ophthalmology* 1996;103:1438-42). The current investigators hypothesize that cigarette smoking, through its deleterious effects on the retinal vasculature, may affect diabetic maculopathy.

"We did not demonstrate this effect, but if we had studied the angiographic findings in patients with diabetic macular edema, we may not have associated cigarette smoking with an increase in the development of areas of macular ischemia," the investigators said.

"Our data suggest that better control of glycemia, LDL cholesterol levels, and blood pressure in type 1 diabetes patients may be beneficial in reducing the incidence of diabetic macular edema," the researchers concluded, adding that their results validate the current guidelines for ophthalmologic care for the detection of diabetic macular edema over the long-term course of diabetes. ■

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