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Update on Diabetes Classification 1
Celeste C. Thomas and Louis H. Philipson

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The goal in diagnosing diabetes mellitus is to identify those with significantly increased premature mortality and increased risk of microvascular and cardiovascular complications. This brief review shows the evolving nature of the classification of diabetes mellitus. No classification scheme is ideal, and all have some overlap and inconsistencies. Diabetes mellitus classification will continue to evolve as we work to fully understand the pathogenesis of the major forms.

Internet Blood Glucose Monitoring Systems Provide Lasting Glycemic Benefit in Type 1 and 2 Diabetes: A Systematic Review 17
Hugh D. Tildesley, Michelle D. Po, and Stuart A. Ross

Internet blood glucose monitoring systems (IBGMS) are associated with improved glycemic control in patients with type 2 diabetes (T2D) who are pharmacologically managed, using oral agents or insulin. IBGMS improves glycemic levels in patients with type 1 diabetes (T1D). IBGMS has not led to increased hypoglycemia. Mechanisms underlying IBGMS-associated glycemic improvement extend beyond optimizing insulin dose titration. The most important effects seem to be associated with increased patient self-motivation and improved patient-physician communication. IBGMS have been recommended in clinical practice guidelines, and their effectiveness and safety in trials suggest that this approach is appropriate for patients with T1D or T2D.

Monitoring Glycemia in Diabetes 35
Sara J. Healy and Kathleen M. Dungan

Monitoring of glycemic control is a key component of the diabetes treatment plan. Patients who are not meeting targets often require more intensive monitoring, ranging from frequent self-monitored glucose to continuous glucose monitoring in order to facilitate medication and lifestyle changes. However, more intensive monitoring demands more training and a structured plan for interpretation and use of the data. Better patient and provider tools to support decision-making and progress toward an artificial pancreas may help to alleviate this burden.
Hyperglycemia is the unifying metabolic abnormality for all forms of diabetes mellitus, forming the basis for its diagnosis and treatment. The strong epidemiologic associations between hyperglycemia and the complications of diabetes have given rise to the glucose hypothesis—that the complications of diabetes are caused by hyperglycemia and that they can be prevented by normalizing glucose levels. Herein the authors review the epidemiologic relationships between hyperglycemia and the complications of diabetes, the major trials of glucose lowering, and the extent to which the glucose hypothesis is supported by these studies and how this information can be translated into clinical practice.

Diabetes now affects more than 29 million Americans, and more than 9 million of these people do not know they have diabetes. In adults, type 2 diabetes accounts for about 90% to 95% of all diagnosed cases of diabetes and is the focus of this article. Lifestyle intervention is part of the initial treatment as well as the ongoing management of type 2 diabetes. Lifestyle intervention encompasses a healthful eating plan, physical activity, and often medication to assist in achievement of glucose, lipid, and blood pressure goals. Patient education and self-care practices are also important aspects of disease management.

The epidemic of type 2 diabetes mellitus has been met by evolving strategy and clinical tactics, including the generally-accepted recommendation to initiate drug therapy concurrent with therapeutic lifestyle changes. Barring contraindications, metformin should be the first drug treatment prescribed, based on considerations of cost, efficacy, and safety. When metformin monotherapy fails to produce the goal for glycemic control, add-on therapy can include a sulfonylurea, a sodium-glucose transporter type 2 inhibitor, an alpha-glucosidase inhibitor, or a thiazolidinedione. New niche therapies include colesvevelam and bromocriptine mesylate. Consideration should be given to the effect of the drug therapy on cardiovascular disease.

Incretin hormones, namely glucagon-like peptide 1 (GLP-1) and gastric inhibitory peptide, have been recognized for some time as playing a key role in glucose homeostasis, with the effects of incretin hormones believed to be responsible for up to 60% of postprandial insulin release. Two predominant therapeutic strategies have been developed to augment the incretin response: (1) GLP-1 receptor agonists resistant to degradation by the enzyme dipeptidyl peptidase 4 (DPP-4); and (2) DPP-4 inhibitors. With an expanding arsenal of incretin-based therapies available, understanding...
the differentiating efficacy and safety profiles for available agents is important in optimizing drug selection and patient outcomes.

Sodium Glucose Cotransporter 2 Inhibitors
John R. White Jr

This article provides an overview of the physiologic basis, pharmacology, and current clinical experience with sodium glucose cotransporter 2 (SGLT2) inhibitors. It details the role of the kidneys in glucose homeostasis and the impact on that regulatory system of the use of SGLT2 inhibitors. The article also includes an overview of the impact of SGLT2s on glycemic control in patients with diabetes. In addition, it outlines the potential benefits and problems encountered with the use of these agents.

Insulin Therapy in Type 1 Diabetes
Elizabeth Stephens

Although not curable, type 1 diabetes is controllable. Intensive insulin therapy provides primary care providers with a blueprint for reducing the frequency of the devastating complications of diabetes that were all too common in the recent past. Considering the remarkable advances in contemporary therapy, including multiple daily injections and subcutaneous insulin infusions, the likelihood of even greater future improvements in quality of life and survivability can be anticipated. Success requires patient engagement and education, an informed primary care provider, and an interdisciplinary team to maximize the benefits of insulin therapy and avoid the risks of hypoglycemia.

Insulin Tactics in Type 2 Diabetes
Farah Meah and Rattan Juneja

Type 2 diabetes is a heterogeneous disorder with multiple pathophysiologic defects resulting in an inability to maintain euglycemia. When exogenous insulin is used in its treatment, it is important to take into account its pharmacokinetic properties and attempt to match its peaks and troughs with those of glucose. In this article, the authors discuss strategies on introducing insulin as a treatment option in patients with Type 2 diabetes and how to decrease it when other noninsulin drugs are added to the treatment regimen.

Nonglycemic Targets in Diabetes
Dawn DeWitt, David C. Dugdale, and William R. Adam

New treatment target guidelines for the treatment of hypertension, lipids, and nephropathy have recently been released for patients with diabetes, including new treatment targets for geriatric patients. In general, these guidelines have simplified care for patients with diabetes and for their providers. This article reviews these targets in detail. Also, because mental health is key to treatment adherence, the authors summarize the treatment guidelines for important diagnostic and treatment issues related to mental health. Finally, the authors include clinical target recommendations related to driving safety for patients with diabetes.
Screening and Treatment by the Primary Care Provider of Common Diabetes Complications 201
Matthew P. Gilbert

Diabetes is the leading cause of end-stage renal disease, blindness, and nontraumatic lower-limb amputation. The largest reductions in cardiovascular events are seen when multiple risk factors are addressed simultaneously. The benefit of aspirin as secondary prevention in patients with previous stroke or myocardial infarction has been well established. Regular, dilated eye examinations are effective in detecting sight-threatening diabetic retinopathy and have been shown to prevent blindness. The use of appropriate tools and clinical examination/inspection provides greater than 87% specificity in detecting diabetic peripheral neuropathy. Early treatment of risk factors, including hypertension, hyperglycemia, and dyslipidemia can delay or prevent diabetic nephropathy.

Polycystic Ovarian Syndrome 221
Subbulaxmi Trikudanathan

Polycystic ovarian syndrome (PCOS) is a complex and phenotypically heterogeneous endocrine disorder that typically presents in reproductive-aged women. Key clinical components include hyperandrogenism, menstrual irregularities, infertility, and cardiometabolic abnormalities. Definition of PCOS has been confusing and controversial because of the lack of consistent diagnostic criteria. Management choices in women with PCOS should target the phenotype and individual needs of the patient. Oral contraceptives remain the first line of treatment for hyperandrogenic symptoms and menstrual dysfunction. Lifestyle modifications and metformin improve metabolic abnormalities. Particular attention should be placed on addressing and preventing the long-term cardiometabolic implications of PCOS.

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