suggest that individualized risk assessment and persons with well-controlled DM and no retinopathy at baseline can be safely examined at 2- to 3-year intervals.[501,502] The ophthalmologic examination can also detect other common conditions such as cataracts, glaucoma, and macular degeneration. The use of nonmydriatic fundus cameras equipped with digital transmission technology enables large-scale point-of-care (POC) screening for retinopathy.[503] Screening programs have been most successful in defined populations with government-organized health care systems, such as in the United Kingdom and Scandinavia and in American Indian tribes rather than in the general population of the United States.[503-506] Persons with abnormal retinal photographs are referred to an ophthalmologist for a complete eye examination. This two-step approach can be an effective strategy for retinopathy screening at the population level, particularly in remote areas.[507]

Artificial intelligence approaches to screening for diabetic retinopathy have progressed to the point of utility and cost-effectiveness.[508-513] Given the relatively low prevalence of proliferative retinopathy and/or macular edema in persons with T2D during the first decade after diagnosis, however, the suggestion is now being made that persons with T2D who have had a negative ophthalmologic examination may safely have the screening interval increased to 2 or 3 years.[514-517] Retinopathy develops over a period of 5 or more years from initial hyperglycemia, so screening should be initiated within 5 years of diagnosis in persons with T1D.[518] Pregnancy is a risk factor for progression of retinopathy, and ophthalmologic examinations should be performed repeatedly during pregnancy and for 1 year postpartum.[519] Persons with active lesions may be followed more frequently, whereas those who have had repeatedly normal eye findings can be seen less frequently. Elevated prepregnancy A1C and duration of T1D >10 years predict progression.[520] Teenage girls may have more difficulty controlling T1D than do teenage boys and thus risk more complications.[521] Thus, multiple systemic factors influence the risk of the development and progression of diabetic retinopathy.

Management of retinopathy requires attention to multiple systemic and ocular factors. Optimization of glucose and BP are the proven strategies for primary prevention of diabetic retinopathy and for slowing the progression of preexisting nonproliferative retinopathy.[78,185,186,193,522,523]

Other options that can stabilize retinopathy include lifestyle intervention or bariatric surgery in persons with T2D or physical activity in persons with T1D.[524-527] One study suggested that dietary marine omega-3 fatty acids may slow sight-threatening retinopathy, but further investigation is needed.[528]

In addition, pharmacologic treatment approaches may have specific benefit in diabetic retinopathy, including ACE inhibitors, ARBs,[529,530] and fibrate lipid-lowering agents.[531-533] Research into other novel pharmacologic agents with potential benefits may lead to additional medical treatments.[534]

The ophthalmic treatment of proliferative retinopathy has evolved in the past decade. Panretinal laser photocoagulation has been the primary treatment for decades because it provides enduring effects. Anti-vascular endothelial growth factor (VEGF) antibodies also inhibit neovascularization.[535] However, after 5 years of follow-up, the rate of visual field sensitivity is equivalent in the drug- and laser-treated groups.[536] Moreover, persons who fail to return for continued anti-VEGF treatments are at risk of losing vision.[537,538] Therefore, treatment should be individualized, in some cases combining panretinal photocoagulation and anti-VEGF therapy.[539] Vitrectomy effectively restores vision for many persons with persistent vitreous hemorrhage, vitreous scarring, and detachment.[540] Diabetic macular edema in the absence of proliferative retinopathy is most commonly treated with repeated anti-VEGF injections.[541]

Question 8: How should neuropathy be diagnosed and managed in persons with DM?

Recommendation 8.1

Diabetic peripheral neuropathy (DPN) is a clinical diagnosis. A comprehensive differential diagnosis should be considered to rule out nondiabetic neuropathies.
Grade B; BEL 2

Recommendation 8.2

Screening for DPN should be done at diagnosis of T2D, within 5 years of the diagnosis of T1D, and subsequently annually or whenever symptoms occur, by performing a clinical history and physical exam.
Grade B; BEL 2

Recommendation 8.3

Assessments for DPN should include a careful history to assess target symptoms and a combination of at least two of the following: vibration sensation using a 128-Hz tuning fork, pinprick sensation, temperature discrimination, 10-g monofilament testing on the dorsal aspect of the great toe bilaterally, and ankle reflexes. All these assessments should follow the typical DPN pattern, starting distally (the dorsal aspect of the hallux) on both sides and move proximally until a sensory threshold is identified.
Grade A; BEL 2, upgraded by expert opinion of task force

Recommendation 8.4

Screening for CV autonomic neuropathy (CAN) should be considered at diagnosis of T2D and at 5 years after the diagnosis of T1D, including youth. Screening for CAN should also be considered in the presence of DPN, DKD, 2 or more CV risk factors, hypoglycemia unawareness, high glucose variability, in persons with HF, perioperatively, or in individuals presenting with autonomic symptoms. A careful differential to exclude other comorbidities or drug effects/interactions that could mimic CAN should be performed.
Grade B; BEL 2

Recommendation 8.5

CV reflex tests (deep breathing, Valsalva, supine to standing) remain the gold standard and are recommended for assessment of CAN. Indices of heart rate variability (HRV) derived from electrocardiogram recordings could also be used as an easier alternative for screening for CAN.
Grade A; BEL 2, upgraded by expert opinion of task force

Recommendation 8.6

Diabetic foot exams should be performed at every visit (in person or virtual) to identify deformities and to identify those at risk for late complications such as ulcerations and amputations.
Grade A; BEL 1

Recommendation 8.7

Intensive glucose control applied as early as possible is recommended to prevent the onset of DPN and CAN in T1D. Achieving optimal control of glucose, BP, and lipid levels along with lifestyle interventions, including weight loss and exercise, are recommended to prevent DPN and CAN in T2D. Lifestyle interventions are