

STANDARDS OF MEDICAL CARE IN DIABETES 2016

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STANDARDS OF CARE

- Funded out Association's general revenues and *does not use* industry support.
- Slides correspond with sections within the Standards of Medical Care in Diabetes—2016.
- Reviewed and approved by the Executive Committee of the Association's Board of Directors.

PROCESS

- ADA's Professional Practice Committee (PPC) conducts annual review & revision.
- Searched Medline for human studies related to each subsection and published since January 1, 2015.
- Recommendations revised per new evidence, for clarity, or to better match text to strength of evidence.

[Professional.diabetes.org/SOC](https://professional.diabetes.org/SOC)

CLINICAL PRACTICE RECOMMENDATIONS EVIDENCE GRADING SYSTEM

A

- Clear evidence from adequately-powered, well-conducted, generalizable RCTs, including evidence from a multicenter trial or meta-analysis that incorporated quality ratings in the analysis;
- Compelling nonexperimental evidence;
- Supportive evidence from adequately-powered, well-conducted RCTs.

B

- Supportive evidence from a well-conducted cohort studies
- Supportive evidence from a well-conducted case-control study
- Supportive evidence from poorly controlled or uncontrolled studies or evidence from observational studies with high potential for bias

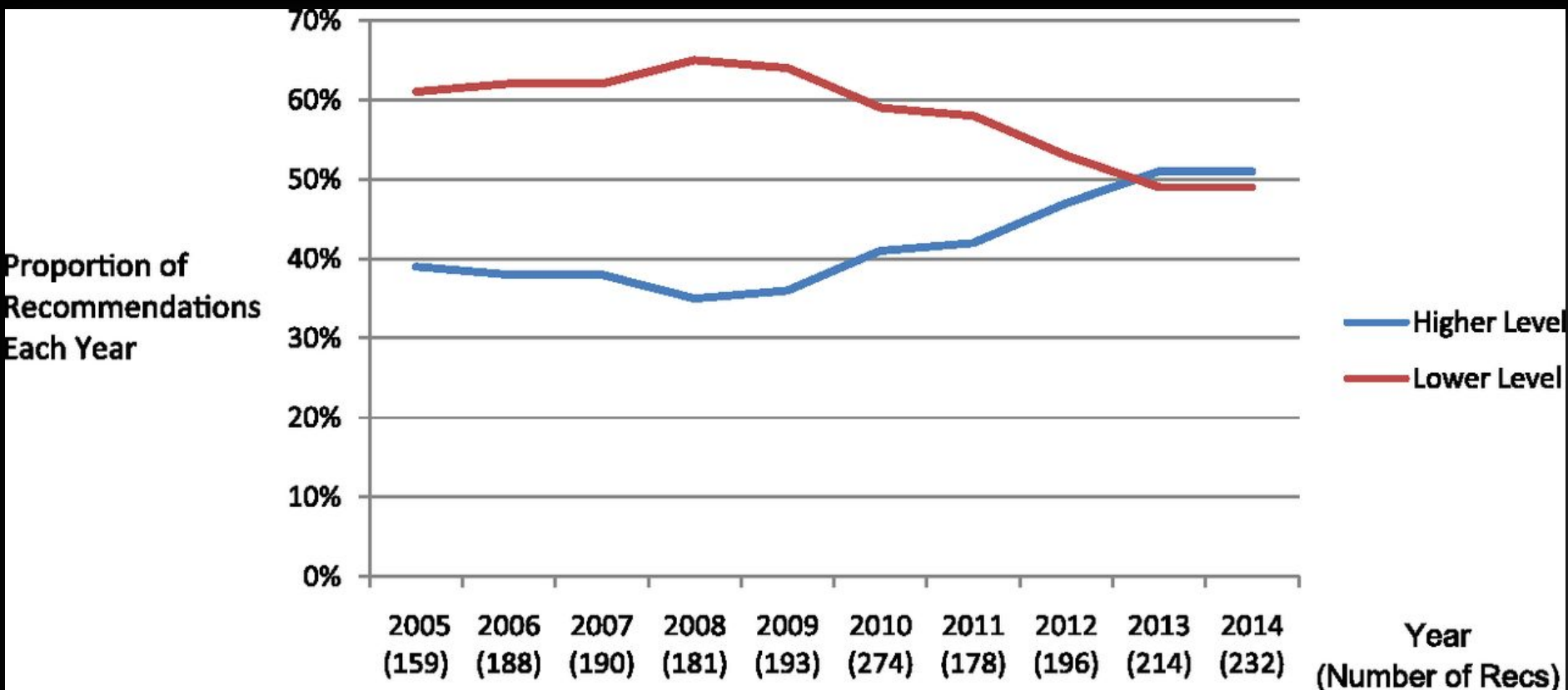
C

- Evidence from case series or case reports
- Conflicting evidence with the weight of evidence supporting the recommendation

E

- Expert consensus or clinical experience

TRENDS IN THE NUMBER AND PROPORTION OF HIGHER AND LOWER LEVEL RECOMMENDATIONS

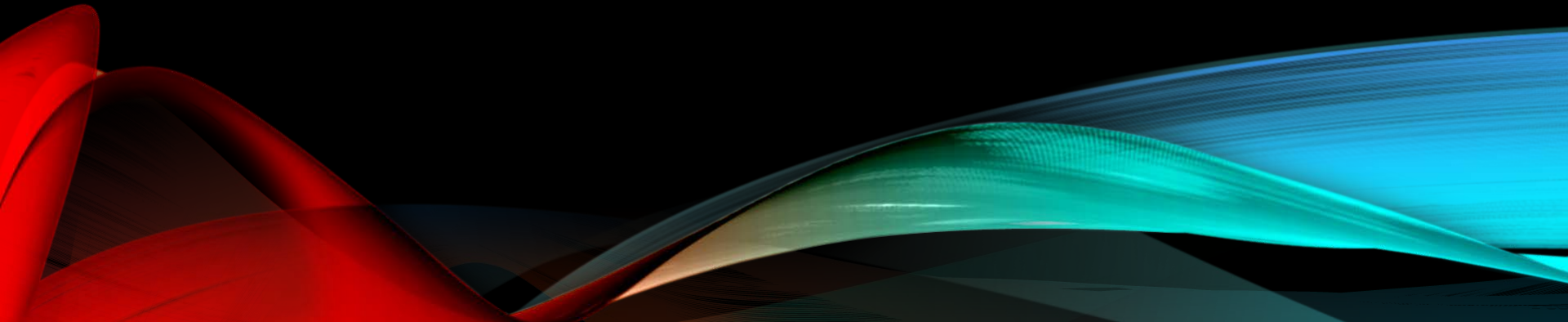


- Higher level recommendations defined as A or B evidence grades
- Lower level recommendations defined as C or E evidence grades

TERMINOLOGY

- No longer using the term “diabetic.”
- Diabetes does not define people.
- People with diabetes are individuals with diabetes, not “diabetics.”
- “Diabetic” will continue to be used related to complications, e.g., “diabetic retinopathy.”

1. STRATEGIES FOR IMPROVING DIABETES CARE



CARE DELIVERY SYSTEMS

- 33-49% of patients still do not meet targets for A1C, blood pressure, or lipids.
- 14% meet targets for all A1C, BP, lipids, and nonsmoking status.
- Progress in CVD control is slowing.
- Substantial system-level improvements are needed.
- Delivery system is fragmented, lacks clinical information capabilities, duplicates services & is poorly designed.

CHRONIC CARE MODEL

Six Components:

1. Delivery system design
2. Self-management support
3. Decision support
4. Clinical information systems
5. Community resources & policies
6. Health systems

www.BetterDiabetesCare.nih.gov

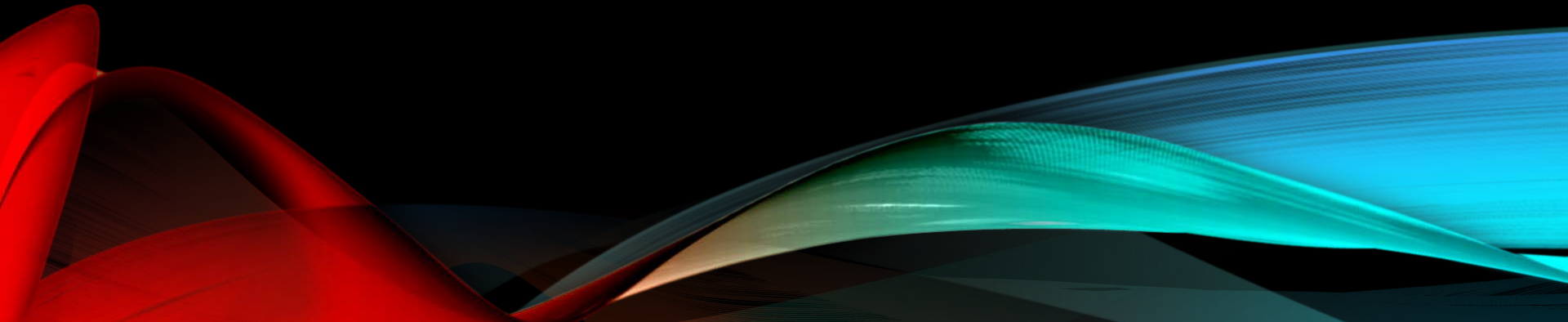
WHEN TREATMENT GOALS AREN'T MET

- Seek evidence-based approaches that improve clinical outcomes and quality of life.
- Recent reviews of quality improvement strategies have not identified one approach that's more effective than others.
- Translating Research Into Actions for Diabetes (TRIAD) study provided objective data.

HEALTH DISPARITIES

- Lack of health insurance
- Food insecurity (FI)
 - Carefully evaluate hyperglycemia and hypoglycemia and propose solutions **A**
 - Recognize that homelessness, poor literacy, and poor numeracy often occur with food insecurity; appropriate resources should be made available for patients with diabetes. **A**

2. Classification and Diagnosis of Diabetes



CLASSIFICATION OF DIABETES

1. Type 1 diabetes
 - β -cell destruction
2. Type 2 diabetes
 - Progressive insulin secretory defect
3. Gestational Diabetes Mellitus (GDM)
4. Other specific types of diabetes
 - Monogenic diabetes syndromes
 - Diseases of the exocrine pancreas, e.g., cystic fibrosis
 - Drug- or chemical-induced diabetes

CRITERIA FOR THE DIAGNOSIS OF DIABETES

**Fasting plasma glucose (FPG)
≥126 mg/dL (7.0 mmol/L)**

OR

**2-h plasma glucose ≥200 mg/dL
(11.1 mmol/L) during an OGTT**

OR

A1C ≥6.5%

OR

**Random plasma glucose
≥200 mg/dL (11.1 mmol/L)**

CRITERIA FOR THE DIAGNOSIS OF PREDIABETES

**FPG 100–125 mg/dL
(5.6–6.9 mmol/L): IFG**

OR

**2-h plasma glucose 140–199 mg/dL
(7.8–11.0 mmol/L): IGT**

OR

A1C 5.7–6.4%

* For all three tests, risk is continuous, extending below the lower limit of a range and becoming disproportionately greater at higher ends of the range.

A1C $\geq 6.5\%$

- Performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay –
www.ngsp.org
- POC testing not recommended
- Greater convenience, preanalytical stability, and less day-to-day perturbations than FPG and OGTT
- Consider cost, age, race/ethnicity, anemia, etc.

RECOMMENDATIONS: SCREENING FOR TYPE 2 DIABETES

- Consider testing in asymptomatic adults of any age with BMI ≥ 25 kg/m² or ≥ 23 kg/m² in Asian Americans who have 1 or more add'l dm risk factors. **B**
- For all patients, testing should begin at age 45 years. **B**
- If tests are normal, repeat testing carried out at a minimum of 3-year intervals is reasonable. **C**

RECOMMENDATIONS: SCREENING FOR TYPE 2 DIABETES (2)

- FPG, 2-h PG after 75-g OGTT, and the A1C are equally appropriate. **B**
- In patients with diabetes, identify and, if appropriate, treat other CVD risk factors. **B**
- Consider testing for T2DM in overweight/obese children and adolescents with 2 or more add'l diabetes risk factors. **E**

RECOMMENDATIONS: PREDIABETES

- Testing should begin at age 45 for all patients, particularly those who are overweight or obese. **B**
- Consider testing for prediabetes in asymptomatic adults of any age w/ BMI ≥ 25 kg/m² or ≥ 23 kg/m² (in Asian Americans) who have 1 or more add'l risk factors for diabetes. **B**
- If tests are normal, repeat at a minimum of 3-year intervals. **C**

RECOMMENDATIONS: PREDIABETES (2)

- FPG, 2-h PG after 75-g OGTT, and A1C, are equally appropriate for prediabetes testing. **B**
- In patients with prediabetes, identify and, if appropriate, treat other CVD risk factors. **B**
- Consider prediabetes testing in overweight/obese children and adolescents with 2 or more add'l diabetes risk factors. **E**

CRITERIA FOR TESTING FOR T2DM IN CHILDREN & ADOLESCENTS

- Overweight plus any 2 :
 - Family history of type 2 diabetes in 1st or 2nd degree relative
 - Race/ethnicity
 - Signs of insulin resistance or conditions associated with insulin resistance
 - Maternal history of diabetes or GDM
- Age of initiation 10 years or at onset of puberty
- Frequency: every 3 years
- Screen with A1C

RECOMMENDATIONS: DETECTION AND DIAGNOSIS OF GDM

- Test for undiagnosed T2DM at the 1st prenatal visit in those with risk factors. **B**
- Test for GDM at 24–28 weeks of gestation in women not previously known to have diabetes. **A**
- Screen women with GDM for persistent diabetes at 6–12 weeks postpartum, using the OGTT. **E**

RECOMMENDATIONS: DETECTION AND DIAGNOSIS OF GDM (2)

- Women with GDM history should have lifelong screening for development of diabetes or prediabetes at least every 3 years. **B**
- Women with GDM history found to have prediabetes should receive lifestyle interventions or metformin to prevent diabetes. **A**

BASIS FOR INITIAL CARE

- Diabetes Self-Management Education (DSME)
- Diabetes Self-Management Support (DSMS)
- Medical Nutrition Therapy (MNT)
- Physical activity education
- Smoking cessation counseling
- Guidance on routine immunizations
- Psychosocial care

RECOMMENDATIONS: DIABETES SELF-MANAGEMENT EDUCATION & SUPPORT

- All people with diabetes should participate in DSME and DSMS both at diagnosis and as needed thereafter. **B**
- Effective self-management, improved clinical outcomes, health status, and quality-of-life are key outcomes of DSME and DSMS and should be measured and monitored as part of care. **C**
- DSME/S should be patient-centered, respectful, and responsive to individual patient preferences, needs, and values that should guide clinical decisions. **A**

RECOMMENDATIONS: NUTRITION

Effectiveness of Nutrition Therapy:

- An individualized MNT program is recommended for all people with type 1 and type 2 diabetes. **A**
- For people with T1DM or those with T2D who are on a flexible insulin program, education on carb counting or estimation. **A**
- For patients on a fixed insulin program, having a consistent pattern of carbohydrate intake with respect to time and amount can result in improved glycemic control and a reduced risk of hypoglycemia. **B**

RECOMMENDATIONS: PHYSICAL ACTIVITY

- Children with diabetes/prediabetes: at least 60 min/day physical activity **B**
- Adults with diabetes: at least 150 min/wk of moderate-intensity aerobic activity over at least 3 days/week with no more than 2 consecutive days without exercise **A**
- All individuals, including those with diabetes, should reduce sedentary time, particularly by breaking up extended amounts of time (>90 min) spent sitting. **B**
- Adults with type 2 diabetes should perform resistance training at least twice weekly **A**

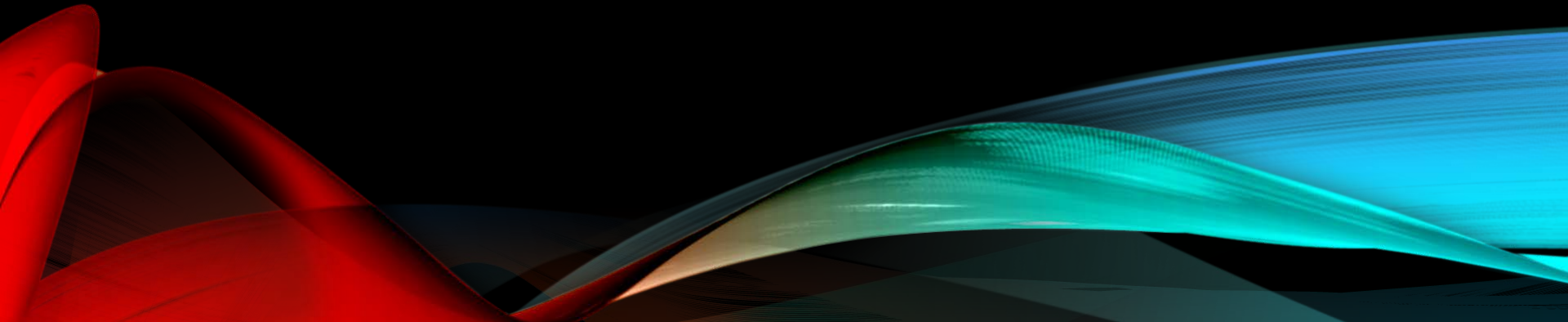
RECOMMENDATIONS: SMOKING CESSATION

- Advise all patients not to use cigarettes, other tobacco products, or e-cigarettes. **A**
- Include smoking cessation counseling and other forms of treatment as a routine component of diabetes care. **B**

RECOMMENDATIONS: PSYCHOSOCIAL CARE

- Routinely screen for depression, diabetes-related distress, anxiety, eating disorders & cognitive impairment. **B**
- Adults aged ≥ 65 years with DM should be considered for evaluation of cognitive function, depression screening and treatment. **B**
- Patients with diabetes and depression should receive a collaborative care approach for depression mgmt. **A**

3. Glycemic Targets



DIABETES CARE: GLYCEMIC CONTROL

- Two primary techniques available for health providers and patients to assess effectiveness of management plan on glycemic control
 1. Patient self-monitoring of blood glucose (SMBG)
 2. A1C
- CGM or interstitial glucose may be a useful adjunct to SMBG in selected patients.

RECOMMENDATIONS: GLUCOSE MONITORING

- When prescribed as part of a broader educational context, SMBG results may be helpful to guide treatment decisions and/or patient self-management for patients using less frequent insulin injections **B** or noninsulin therapies. **E**
- When prescribing SMBG, ensure that patients receive ongoing instruction and regular evaluation of SMBG technique and SMBG results, and their ability to use SMBG data to adjust therapy. **E**

RECOMMENDATIONS: A1C TESTING

- Perform the A1C test at least 2x annually in patients that meet treatment goals (and have stable glycemic control). **E**
- Perform the A1C test *quarterly* in patients whose therapy has changed or who are not meeting glycemic goals. **E**
- Use of point-of-care (POC) testing for A1C provides the opportunity for more timely treatment changes. **E**

RECOMMENDATIONS: GLYCEMIC GOALS IN ADULTS

- Lowering A1C to $<7\%$ has been shown to reduce microvascular complications and, if implemented soon after the diagnosis of diabetes, is associated with long-term reduction in macrovascular disease. **B**
- Consider more stringent goals (e.g. $<6.5\%$) for select patients if achievable without significant hypos or other adverse effects. **C**
- Consider less stringent goals (e.g. $<8\%$) for patients with a hx of severe hypoglycemia, limited life expectancy, or other conditions that make $<7\%$ difficult to attain. **B**

APPROACH TO THE MANAGEMENT OF HYPERGLYCEMIA

Patient/Disease Features

Risks associated with hypoglycemia & other drug adverse effects

Disease Duration

Life expectancy

Important comorbidities

Established vascular complications

Patient attitude & expected treatment efforts

Resources & support system

more stringent ← A1C 7% → less stringent

low high

newly diagnosed long-standing

long short

absent Few/mild severe

absent Few/mild severe

highly motivated, adherent, excellent self-care capabilities

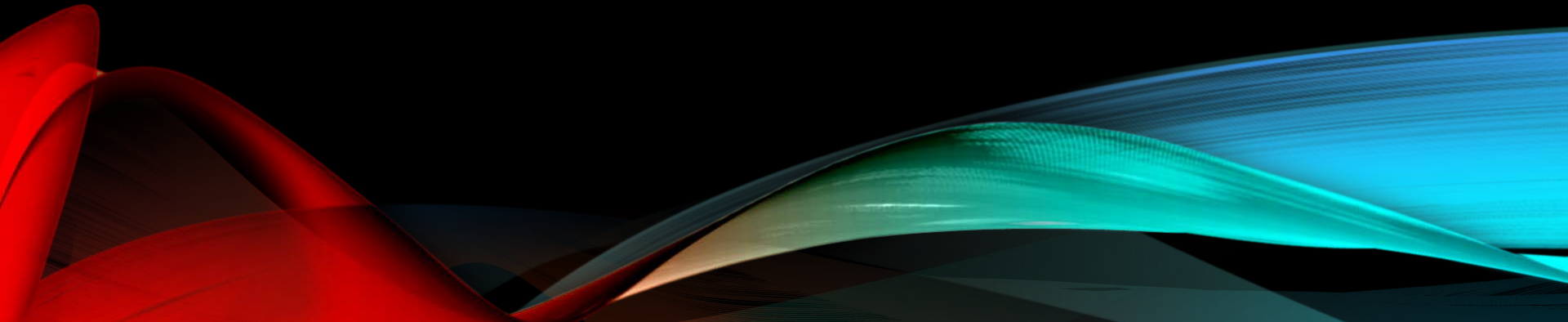
less motivated, nonadherent, poor self-care capabilities

readily available limited

Usually not modifiable

Potentially modifiable

4. Approaches to Glycemic Treatment



RECOMMENDATIONS: PHARMACOLOGICAL THERAPY FOR TYPE 1 DIABETES

- Most people with T1DM should be treated with multiple dose insulin (MDI) injections (3–4 injections /day of basal & prandial insulin) or continuous subcutaneous insulin infusion (CSII). **A**
- Individuals who have been successfully using CSII should have continued access after they turn 65 years old. **E**

RECOMMENDATIONS: PHARMACOLOGICAL THERAPY FOR TYPE 1 DIABETES (2)

- Consider educating individuals with T1DM on matching prandial insulin dose to carbohydrate intake, premeal blood glucose, and anticipated activity. **E**
- Most individuals with T1DM should use insulin analogs to reduce hypoglycemia risk. **A**

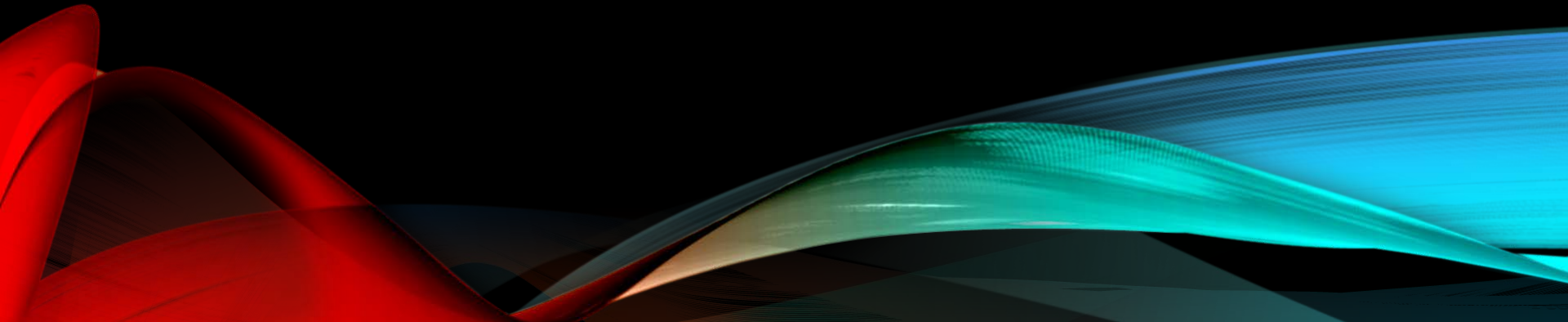
RECOMMENDATIONS: PHARMACOLOGICAL THERAPY FOR T2DM

- Metformin, if not contraindicated and if tolerated, is the preferred initial pharmacological agent for T2DM. **A**
- In patients with newly dx'd T2DM and markedly symptomatic and/or elevated blood glucose levels or A1C, consider insulin therapy (with or without additional agents). **E**

RECOMMENDATIONS: PHARMACOLOGICAL THERAPY FOR T2DM (2)

- If noninsulin monotherapy at maximal tolerated dose does not achieve or maintain the A1C target over 3 months, add a second oral agent, a GLP-1 receptor agonist, or insulin. **A**
- Use a patient-centered approach to treatment. **E**
- Don't delay insulin initiation in patients not achieving glycemic goals. **B**

5. Cardiovascular Disease and Risk Management



CARDIOVASCULAR DISEASE

- CVD is the leading cause of morbidity & mortality for those with diabetes.
- Largest contributor to direct/indirect costs
- Common conditions coexisting with type 2 diabetes (e.g., hypertension, dyslipidemia) are clear risk factors for ASCVD.
- Diabetes itself confers independent risk
- Control individual cardiovascular risk factors to prevent/slow CVD in people with diabetes.
- Systematically assess all patients with diabetes for cardiovascular risk factors.

RECOMMENDATIONS: HYPERTENSION/ BLOOD PRESSURE CONTROL

Systolic Targets:

- People with diabetes and hypertension should be treated to a systolic blood pressure goal of <140 mmHg. **A**
- Lower systolic targets, such as <130 mmHg, may be appropriate for certain individuals, such as younger patients, if it can be achieved without undue treatment burden. **C**

RECOMMENDATIONS: HYPERTENSION/ BLOOD PRESSURE CONTROL (2)

Diastolic Targets:

- Patients with diabetes should be treated to a diastolic blood pressure <90 mmHg. **A**
- Lower diastolic targets, such as <80 mmHg, may be appropriate for certain individuals, such as younger patients, if it can be achieved without undue treatment burden. **B**

RECOMMENDATIONS FOR STATIN TREATMENT IN PEOPLE WITH DIABETES

Age	Risk Factors	Statin Intensity*
<40 years	None	None
	ASCVD risk factor(s) **	Moderate or high
	ASCVD	High
40–75 years	None	Moderate
	ASCVD risk factors	High
	ACS & LDL >50 who can't tolerate high dose statin	Moderate + ezetimibe
>75 years	None	Moderate
	ASCVD risk factors	Moderate or high
	ASCVD	High
	ACS & LDL >50 who can't tolerate high dose statin	Moderate + ezetimibe

* In addition to lifestyle therapy. ** ASCVD risk factors include LDL cholesterol ≥ 100 mg/dL (2.6 mmol/L), high blood pressure, smoking, overweight and obesity, and family history of premature ASCVD.

RECOMMENDATIONS: ANTIPLATELET AGENTS

Consider aspirin therapy (75–162 mg/day) **C**

- As a primary prevention strategy in those with type 1 or type 2 diabetes at increased cardiovascular risk (10-year risk >10%)
- Includes most men or women with diabetes age ≥ 50 years who have at least one additional major risk factor, including:
 - Family history of premature ASCVD
 - Hypertension
 - Smoking
 - Dyslipidemia
 - Albuminuria

RECOMMENDATIONS: CORONARY HEART DISEASE

Screening

- In asymptomatic patients, routine screening for CAD isn't recommended & doesn't improve outcomes provided ASCVD risk factors are treated. **A**
- Consider investigations for CAD with:
 - Atypical cardiac symptoms (e.g. unexplained dyspnea, chest discomfort)
 - Signs or symptoms of associated vascular disease incl. carotid bruits, transient ischemic attack, stroke, claudication or PAD
 - EKG abnormalities (e.g. Q waves) **E**

6. Microvascular Complications and Foot Care

RECOMMENDATIONS: DIABETIC KIDNEY DISEASE

Treatment

- Optimize glucose control to reduce risk or slow progression of diabetic kidney disease. **A**
- Optimize blood pressure control (<140/90 mmHg) to reduce risk or slow progression of diabetic kidney disease. **A**

MANAGEMENT OF CKD IN DIABETES

GFR

Recommended

All patients

Yearly measurement of creatinine, urinary albumin excretion, potassium

45-60

Referral to a nephrologist if possibility for nondiabetic kidney disease exists

Consider dose adjustment of medications

Monitor eGFR every 6 months

Monitor electrolytes, bicarbonate, hemoglobin, calcium, phosphorus, parathyroid hormone at least yearly

Assure vitamin D sufficiency

Consider bone density testing

Referral for dietary counselling

MANAGEMENT OF CKD IN DIABETES (2)

GFR

Recommended

30-44

Monitor eGFR every 3 months

Monitor electrolytes, bicarbonate, calcium, phosphorus, parathyroid hormone, hemoglobin, albumin weight every 3–6 months

Consider need for dose adjustment of medications

< 30

Referral to a nephrologist

RECOMMENDATIONS: DIABETIC RETINOPATHY

- To reduce the risk or slow the progression of retinopathy
 - Optimize glycemic control **A**
 - Optimize blood pressure control **A**

RECOMMENDATIONS: DIABETIC RETINOPATHY (2)

Screening:

- Initial dilated and comprehensive eye examination by an ophthalmologist or optometrist:
 - Adults with type 1 diabetes, within 5 years of diabetes onset. **B**
 - Patients with type 2 diabetes at the time of diabetes diagnosis. **B**

RECOMMENDATIONS: DIABETIC RETINOPATHY (3)

Screening (2):

- If no evidence of retinopathy for one or more eye exam, exams every 2 years may be considered. **B**
- If diabetic retinopathy is present subsequent examinations for type 1 and type 2 diabetic patients should be repeated annually by an ophthalmologist or optometrist. **B**
- If retinopathy is progressing or sight-threatening, more frequent exams required. **B**

RECOMMENDATIONS: NEUROPATHY

Early recognition & management is important because:

1. DN is a diagnosis of exclusion.
2. Numerous treatment options exist.
3. Up to 50% of DPN may be asymptomatic.
4. Recognition & treatment may improve symptoms, reduce sequelae, and improve quality-of-life.

RECOMMENDATIONS: NEUROPATHY (2)

Screening:

- Assess all patients for DPN at dx for T2DM, 5 years after dx for T1DM, and at least annually thereafter. **B**
- Assessment should include history & 10g monofilament testing, and at least one of the following: pinprick, temperature, and vibration sensation. **B**
- Symptoms of autonomic neuropathy should be assessed in patients with microvascular & neuropathic complications. **E**

RECOMMENDATIONS: NEUROPATHY (3)

Treatment:

- Optimize glucose control to prevent or delay the development of neuropathy in patients with T1DM **A** & to slow progression in patients with T2DM. **B**
- Assess & treat patients to reduce pain related to DPN **B** and symptoms of autonomic neuropathy and to improve quality of life. **E**

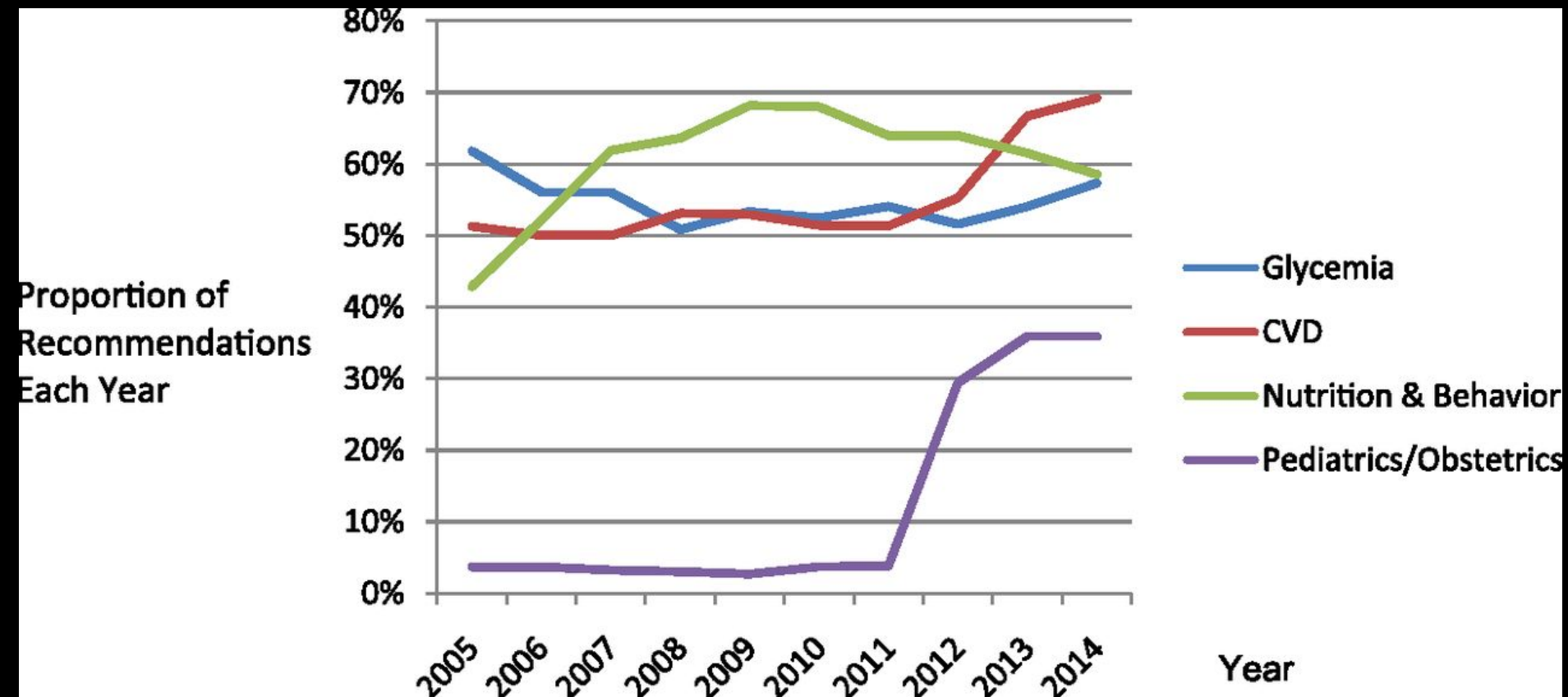
RECOMMENDATIONS: FOOT CARE

- Perform a comprehensive foot evaluation annually to identify risk factors for ulcers & amputations. **B**
- History should contain prior hx of ulceration, amputation, Charcot foot, angioplasty or vascular surgery, cigarette smoking, retinopathy & renal disease; and should assess current symptoms of neuropathy and vascular disease. **B**

RECOMMENDATIONS: FOOT CARE (2)

- Exam should include inspection of the skin, assessment of foot deformities, neurologic assessment & vascular assessment including pulses in the legs and feet. **B**
- Patients with history of ulcers or amputations, foot deformities, insensate feet & PAD are at increased risk for ulcers and amputations and should have their feet examined at every visit. **C**

TRENDS IN THE PROPORTION OF HIGHER LEVEL RECOMMENDATIONS BY CATEGORY



THANK YOU

