GREAT PLAINS DIABETES CENTER

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DIABETES UPDATE 2019

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OBJECTIVES

- REVIEW DIABETES DIAGNOSTIC CRITERIA
- REVIEW GOALS FOR GLUCOSE CONTROL
- HIGHLIGHT WHEN NEW DIABETES MEDS ARE APPROPRIATE AND WHEN OLDER ONES MAY BE NEEDED
- REVIEW DIABETES TECHNOLOGIES INCLUDING INSULIN PUMPS AND CONTINOUS GLUCOSE MONITORS-WHO IS A CANDIDATE

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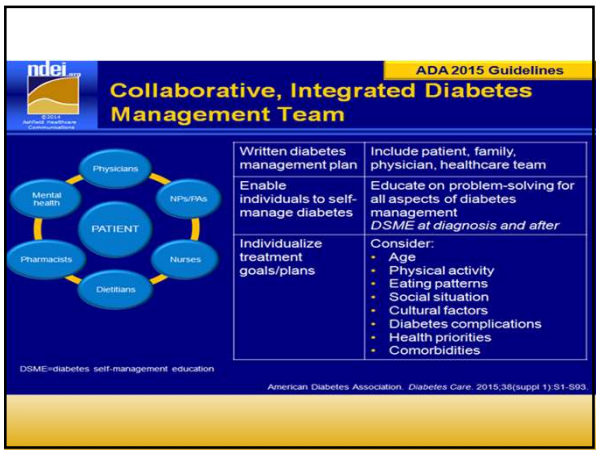
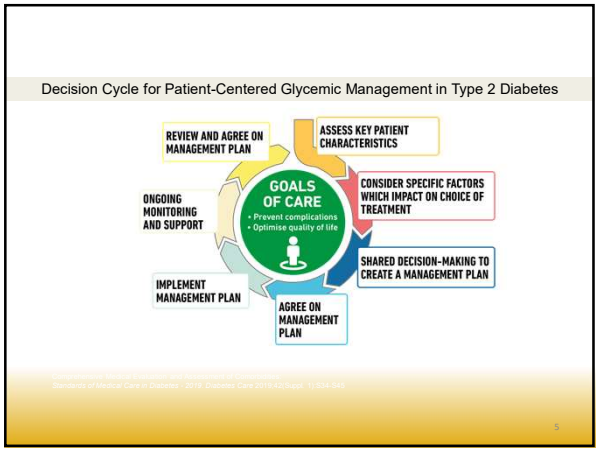

ADA 2015 Guidelines
Collaborative, Integrated Diabetes Management Team
Physicians
NPs/PAs
Nurses
Dietitians
Pharmacists
Mental health
PATIENT
Written diabetes management plan
Include patient, family, physician, healthcare team
Enable individuals to self-manage diabetes
Educate on problem-solving for all aspects of diabetes management
DSME at diagnosis and after
Individualize treatment goals/plans
Consider:
Age
Physical activity
Eating patterns
Social situation
Cultural factors
Diabetes complications
Health priorities
Comorbidities
DSME=diabetes self-management education
American Diabetes Association. Diabetes Care. 2015;38(suppl 1):S1-S93.

4


Decision Cycle for Patient-Centered Glycemic Management in Type 2 Diabetes
REVIEW AND AGREE ON MANAGEMENT PLAN
ASSESS KEY PATIENT CHARACTERISTICS
ONGOING MONITORING AND SUPPORT
GOALS OF CARE
• Prevent complications
• Optimise quality of life
CONSIDER SPECIFIC FACTORS WHICH IMPACT ON CHOICE OF TREATMENT
SHARED DECISION-MAKING TO CREATE A MANAGEMENT PLAN
IMPLEMENT MANAGEMENT PLAN
AGREE ON MANAGEMENT PLAN

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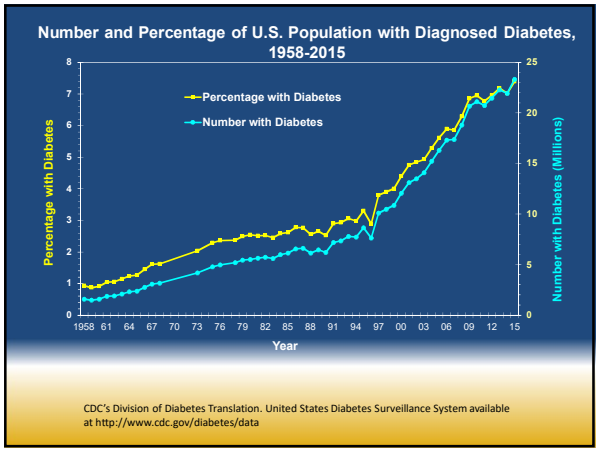
Number and Percentage of U.S. Population with Diagnosed Diabetes, 1958-2015
Percentage with Diabetes
Number with Diabetes
Percentage with Diabetes
Number with Diabetes (Millions)
Year
1958 61 64 67 70 73 76 79 82 85 88 91 94 97 00 03 06 09 12 15
CDC's Division of Diabetes Translation. United States Diabetes Surveillance System available at http://www.cdc.gov/diabetes/data

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DIABETES NUMBERS

- **Prevalence**: In 2015, 30.3 million Americans, or 9.4% of the population, had diabetes.
  - Approximately 1.25 million American children and adults have type 1 diabetes.
- **Undiagnosed**: Of the 30.3 million adults with diabetes, 23.1 million were diagnosed, and 7.2 million were undiagnosed.
- **Prevalence in Seniors**: The percentage of Americans age 65 and older remains high, at 25.2%, or 12.0 million seniors (diagnosed and undiagnosed).
- **New Cases**: 1.5 million Americans are diagnosed with diabetes every year.
- **Deaths**: Diabetes remains the 7th leading cause of death in the United States in 2015, with 79,535 death certificates listing it as the underlying cause of death, and a total of 252,806 death certificates listing diabetes as an underlying or contributing cause of death.

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PREDIABETES NUMBERS

- Eighty-six million people aged 20 years and older
- 1 in 3 American adults
- The percentage of U.S. adults with prediabetes is similar for non-Hispanic whites (35%), non-Hispanic blacks (39%), and Hispanics (38%)
- Without weight loss and moderate physical activity, 15-30% of people with prediabetes will develop type 2 diabetes within 5 years

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COST OF DIABETES

- *Updated March 22, 2018*
- $327 billion: Total costs of diagnosed diabetes in the United States in 2017
- $237 billion for direct medical costs
- $90 billion in reduced productivity
- After adjusting for population age and sex differences, average medical expenditures among people with diagnosed diabetes were 2.3 times higher than what expenditures would be in the absence of diabetes.
- Difficult to measure cost in relation to quality of life

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CLASSIFICATION.

Diabetes can be classified into the following general categories:

1. Type 1 diabetes (due to autoimmune ß-cell destruction, usually leading to absolute insulin deficiency)
2. Type 2 diabetes (due to a progressive loss of ß-cell insulin secretion frequently on the background of insulin resistance)
3. Gestational diabetes mellitus (GDM) (diabetes diagnosed in the second or third trimester of pregnancy that was not clearly overt diabetes prior to gestation)
4. Specific types of diabetes due to other causes, e.g., monogenic diabetes syndromes (such as neonatal diabetes and maturity-onset diabetes of the young [MODY]), diseases of the exocrine pancreas (such as cystic fibrosis and pancreatitis), and drug- or chemical-induced diabetes (such as with glucocorticoid use, in the treatment of HIV/AIDS, or after organ transplantation)

Classification and Diagnosis of Diabetes:
Standards of Medical Care in Diabetes - 2019. Diabetes Care 2019;42(Suppl. 1):S13-S28

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Staging of Type 1 Diabetes

Table 2.1—Staging of type 1 diabetes (4,5)

	Stage 1	Stage 2	Stage 3
Stage	• Autoimmunity • Normoglycemia • Presymptomatic	• Autoimmunity • Dysglycemia • Presymptomatic	• New-onset hyperglycemia • Symptomatic
Diagnostic criteria	• Multiple autoantibodies • No IGT or IFG	• Multiple autoantibodies • Dysglycemia: IFG and/or IGT • FPG 100–125 mg/dL (5.6–6.9 mmol/L) • 2-h PG 140–199 mg/dL (7.8–11.0 mmol/L) • A1C 5.7–6.4% (39–47 mmol/mol) or ≥10% increase in A1C	• Clinical symptoms • Diabetes by standard criteria

American Diabetes Association Standards of Medical Care in Diabetes.
Classification and diagnosis of diabetes. Diabetes Care 2017; 40 (Suppl. 1): S11-S24

American Diabetes Association

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DIAGNOSTIC CRITERIA FOR DM AND PREDIABETES

	Fasting Glucose	Random BG	A1c	GTT
Normal	< 99 mg/dl		3.5-5.6%	
Prediabetes	100-125 mg/dl		5.7-6.4%	
Diabetes	> 126 mg/dl	≥ 200 mg/dl	>6.5%	
Gestational		50 gm non-fasting 1 hour ≥ 140 mg/dl		100 gm OGTT Fasting ≥ 95 mg/dl 1 hr ≥ 180 mg/dl 2 hr ≥ 155 mg/dl 3 hr ≥ 140 mg/dl

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SCREENING RECOMMENDED

- All adults at 45, earlier if
  - BMI ≥ 25
  - First degree relative
  - Physical inactivity
  - High risk race/ethnicity
  - Women delivered > 9# baby or PCOS
  - HDL < 35
  - A1c > 5.7%
  - Hypertension
  - CVD
- Gestational Diabetes
  - Screen for undiagnosed DM at first prenatal visit based on DM risk criteria
  - Screen all women at 24-28 weeks for those not previously known to have diabetes
  - 6 to 12 weeks postpartum, rescreen for diabetes

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CHILDREN AT RISK

- Screening to begin age 10 or puberty onset if
  - Weight is >120% ideal body weight
  - Plus any two risk factors
    - Family history of type 2 dm
    - Race/ethnicity (Native American, African American, Latino, Asian American, Pacific Islander
    - Signs of insulin resistance: acanthosis nigricans, hypertension, dyslipidemia, PCOS, small for gestational age
    - Maternal history of DM or GDM during gestation

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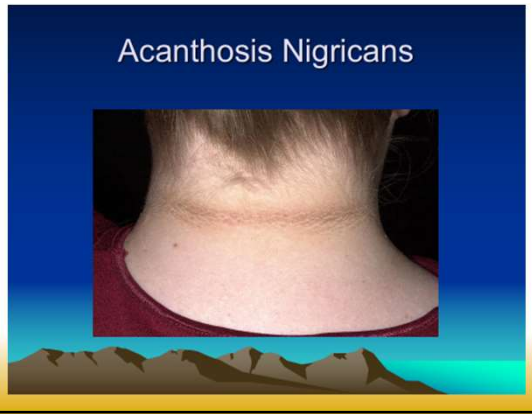

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ADA/AACE GLUCOSE GOALS

Glycemic control & A1c Target

	ADA	AACE
A1c (%)	<7	<6.5
Preprandial (mg/dl)	80-120	<110
Postprandial (mg/dl)	140-180	<140
Bedtime (mg/dl)	100-140	100-140

ADA: American Diabetes Association
AACE: American Association of Clinical Endocrinologists

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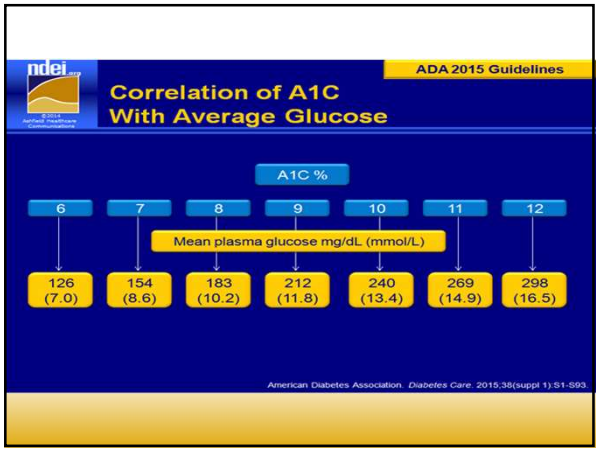

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INDIVIDUALIZATION OF GOALS

- More stringent targets if able to achieve without significant hypoglycemia
- Less stringent targets for those with history of severe hypoglycemia, limited life expectancy, advanced micro or macrovascular disease, limited life expectancy

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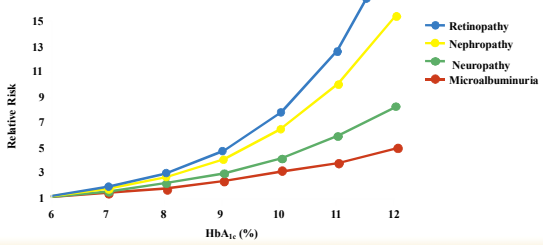
DCCT

RELATIONSHIP OF HBA_{1C} TO RISK OF MICROVASCULAR COMPLICATIONS



Skyler. *Endocrinol Metab Clin.* 1996;25:243-254, with permission.

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ADA 2015 Guidelines

Glycemic Targets for Children and Adolescents With Type 1 Diabetes

Consider risk-benefit assessment, including hypoglycemia risk, when individualizing targets

	All children & adolescents
A1C	<7.5%†
Plasma glucose before meals	90-130 mg/dL (5.0-7.2 mmol/L)
Plasma glucose at bedtime & overnight	90-150 mg/dL (5.0-8.3 mmol/L)

Lower goal (<7.0%) reasonable if can be achieved without excessive hypoglycemia

Goals should be individualized. Glucose goals should be modified in children with frequent hypoglycemia or hypoglycemia unawareness. If on basal-bolus: measure postprandial PG to monitor glycemic values and if discrepancy between preprandial PG and A1C

American Diabetes Association. *Diabetes Care.* 2015;38(suppl 1):S1-S9;

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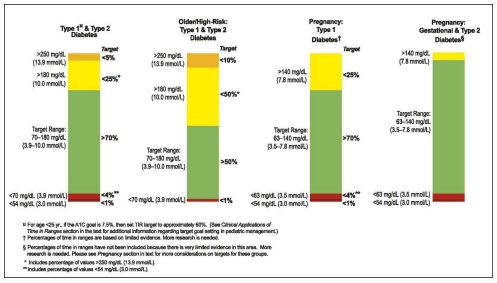
TIME IN TARGET RECOMENDATIONS



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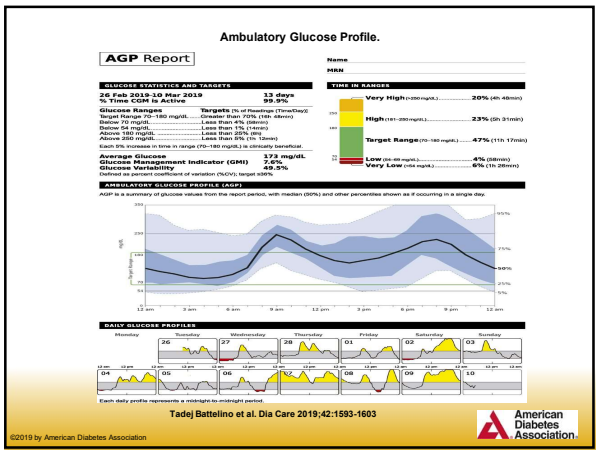
Ambulatory Glucose Profile.
AGP Report
Tadej Battelino et al. Dia Care 2019;42:1593-1603
©2019 by American Diabetes Association
American Diabetes Association.

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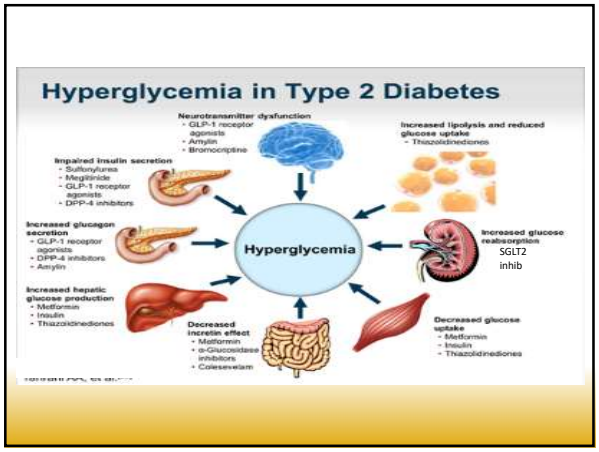
Hyperglycemia in Type 2 Diabetes
Neurotransmitter dysfunction
- GLP-1 receptor agonists
- Amylin
- Bromocriptine
Impaired insulin secretion
- Sulfonylureas
- Meglitinide
- GLP-1 receptor agonists
- DPP-4 inhibitors
Increased lipolysis and reduced glucose uptake
- Thiazolidinediones
Increased glucagon secretion
- GLP-1 receptor agonists
- DPP-4 inhibitors
- Amylin
Hyperglycemia
Increased glucose reabsorption
SGLT2 inhib
Increased hepatic glucose production
- Metformin
- Insulin
- Thiazolidinediones
Decreased incretin effect
- Metformin
- α-Glucosidase inhibitors
- Colesevelam
Decreased glucose uptake
- Metformin
- Insulin
- Thiazolidinediones

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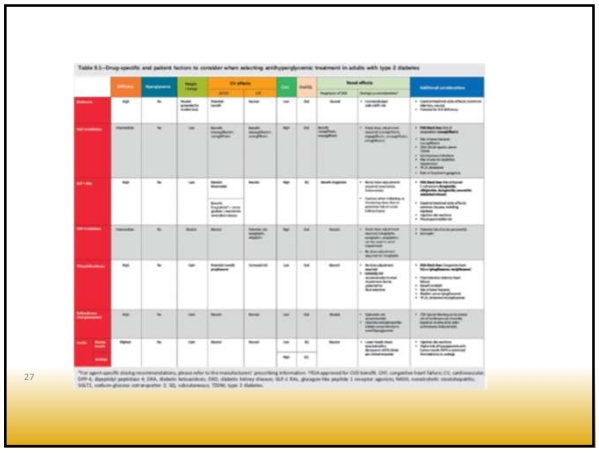

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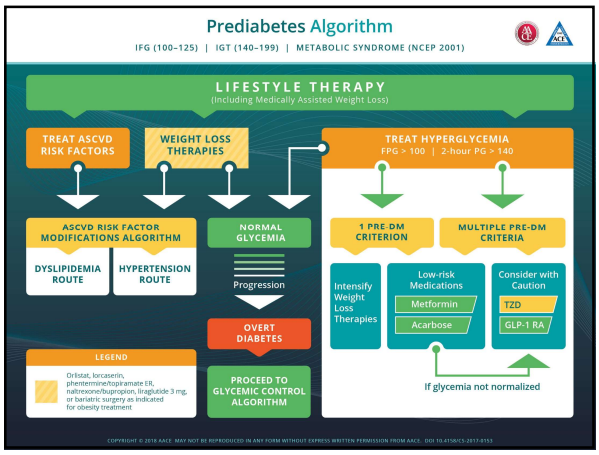
Prediabetes Algorithm
IFG (100–125) | IGT (140–199) | METABOLIC SYNDROME (NCEP 2001)
LIFESTYLE THERAPY
(Including Medically Assisted Weight Loss)
TREAT ASCVD RISK FACTORS
WEIGHT LOSS THERAPIES
TREAT HYPERGLYCEMIA
FPG > 100 | 2-hour PG > 140
ASCVD RISK FACTOR MODIFICATIONS ALGORITHM
DYSLIPIDEMIA ROUTE
HYPERTENSION ROUTE
NORMAL GLYCEMIA
Progression
OVERT DIABETES
1 PRE-DM CRITERION
MULTIPLE PRE-DM CRITERIA
Intensify Weight Loss Therapies
Low-risk Medications
Metformin
Acarbose
Consider with Caution
TZD
GLP-1 RA
If glycemia not normalized
LEGEND
Orlistat, lorcaserin, phentermine/topiramate ER, naltrexone/bupropion, liraglutide 3 mg, or bariatric surgery as indicated for obesity treatment
PROCEED TO GLYCEMIC CONTROL ALGORITHM

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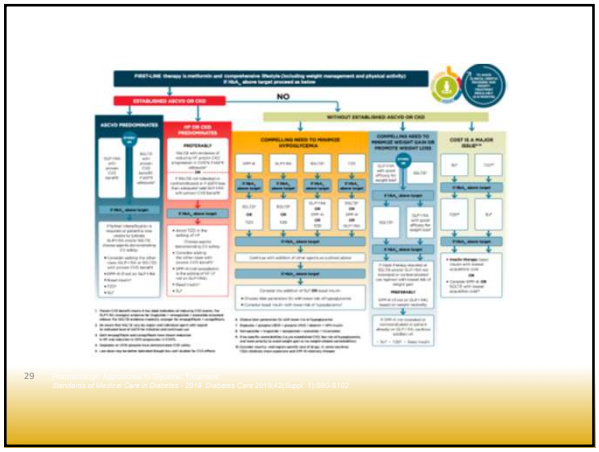
NO
29
Standards of Medical Care in Diabetes - 2019 Diabetes Care 2019;42(Suppl. 1):S61-S70

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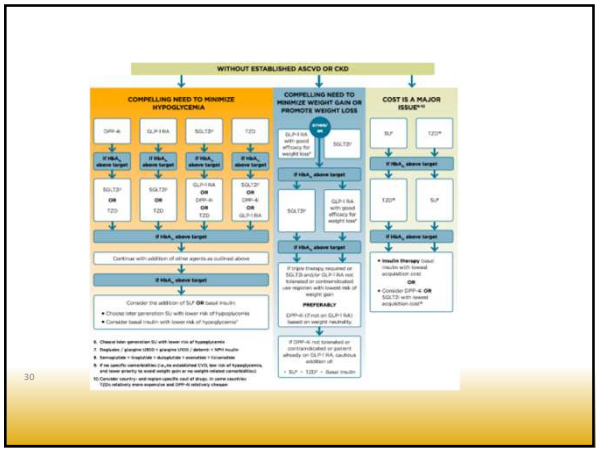
WITHOUT ESTABLISHED ASCVD OR CKD
COMPELLING NEED TO MINIMIZE HYPOGLYCEMIA
COMPELLING NEED TO MINIMIZE WEIGHT GAIN OR PROMOTE WEIGHT LOSS
COST IS A MAJOR ISSUE
30

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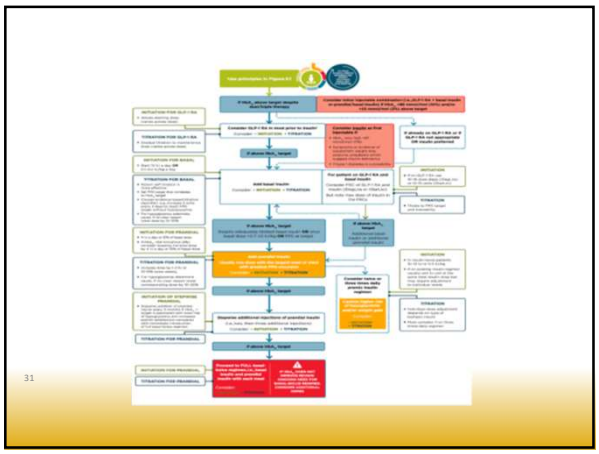
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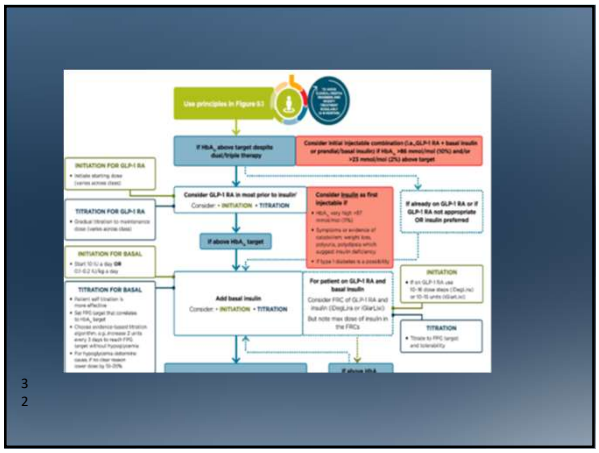
Use principles in Figure S1
If HbA1c above target despite dual/triple therapy
Consider initial injectable combination (i.e.,GLP-1 RA + basal insulin or prandial/basal insulin) if HbA1c >86 mmol/mol (10%) and/or >23 mmol/mol (2%) above target
INITIATION FOR GLP-1 RA
Consider GLP-1 RA in most prior to insulin
Consider • INITIATION • TITRATION
Consider insulin as first injectable if
If already on GLP-1 RA or if GLP-1 RA not appropriate OR insulin preferred
TITRATION FOR GLP-1 RA
If above HbA1c target
INITIATION FOR BASAL
TITRATION FOR BASAL
Add basal insulin
Consider • INITIATION • TITRATION
For patient on GLP-1 RA and basal insulin
INITIATION
TITRATION
32

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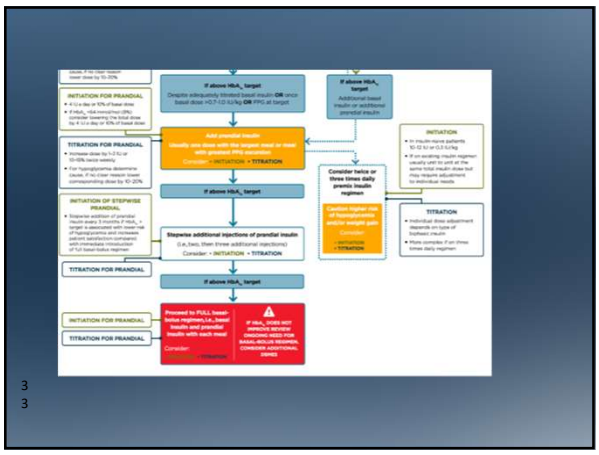
If above HbA1c target
Despite adequately titrated basal insulin OR once basal dose >0.7-1.0 IU/kg OR PPG at target
If above HbA1c target
Additional basal insulin or additional prandial insulin
INITIATION FOR PRANDIAL
TITRATION FOR PRANDIAL
Add prandial insulin
Usually one dose with the largest meal or meal with greatest PPG excursion
Consider • INITIATION • TITRATION
Consider twice or three times daily premix insulin regimen
Caution: higher risk of hypoglycemia and/or weight gain
Consider: • INITIATION • TITRATION
INITIATION
TITRATION
If above HbA1c target
INITIATION OF STEPWISE PRANDIAL
Stepwise additional injections of prandial insulin
(i.e.,two, then three additional injections)
Consider • INITIATION • TITRATION
If above HbA1c target
Proceed to FULL basal-bolus regimen,i.e.,basal insulin and prandial insulin with each meal
IF HbA1c DOES NOT IMPROVE REVIEW ONGOING NEED FOR BASAL-BOLUS REGIMEN. CONSIDER ADDITIONAL AGENTS
Consider: • INITIATION • TITRATION
33

33

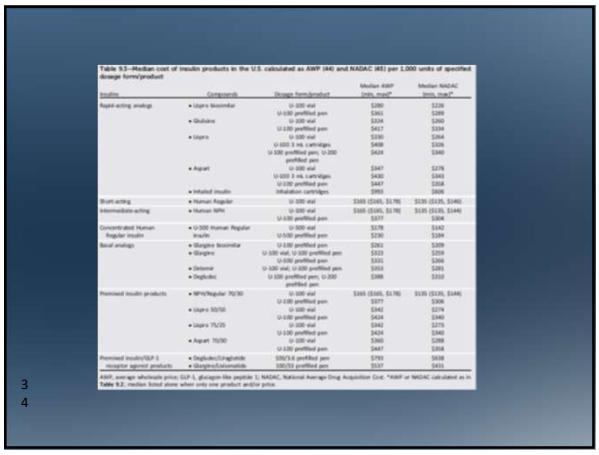

Table 9.3—Median cost of insulin products in the U.S. calculated as AWP (44) and NADAC (45) per 1,000 units of specified dosage form/product

Insulin	Compounds	Dosage form/product	Median AWP (min, max)*	Median NADAC (min, max)*
Rapid-acting analogs	• Lispro biosimilar	U-100 vial	$280	$216
		U-100 prefilled pen	$361	$289
	• Glulisine	U-100 vial	$324	$260
		U-100 prefilled pen	$417	$334
	• Lispro	U-100 vial	$330	$264
		U-100 3 mL cartridges	$408	$326
		U-100 prefilled pen; U-200 prefilled pen	$424	$340
	• Aspart	U-100 vial	$347	$276
		U-100 3 mL cartridges	$430	$343
		U-100 prefilled pen	$447	$358
	• Inhaled insulin	Inhalation cartridges	$993	$606
Short-acting	• Human Regular	U-100 vial	$165 ($165, $178)	$135 ($135, $146)
Intermediate-acting	• Human NPH	U-100 vial	$165 ($165, $178)	$135 ($135, $144)
		U-100 prefilled pen	$377	$304
Concentrated Human Regular insulin	• U-500 Human Regular insulin	U-500 vial	$178	$142
		U-500 prefilled pen	$230	$184
Basal analogs	• Glargine biosimilar	U-100 prefilled pen	$261	$209
	• Glargine	U-100 vial, U-100 prefilled pen	$323	$259
		U-300 prefilled pen	$331	$266
	• Detemir	U-100 vial, U-100 prefilled pen	$353	$281
	• Degludec	U-100 prefilled pen; U-200 prefilled pen	$388	$310
Premixed insulin products	• NPH/Regular 70/30	U-100 vial	$165 ($165, $178)	$135 ($135, $144)
		U-100 prefilled pen	$377	$308
	• Lispro 50/50	U-100 vial	$342	$274
		U-100 prefilled pen	$424	$340
	• Lispro 75/25	U-100 vial	$342	$273
		U-100 prefilled pen	$424	$340
	• Aspart 70/30	U-100 vial	$360	$288
		U-100 prefilled pen	$447	$358
Premixed insulin/GLP-1 receptor agonist products	• Degludec/Liraglutide	100/3.6 prefilled pen	$793	$638
	• Glargine/Lixisenatide	100/33 prefilled pen	$537	$431

AWP, average wholesale price; GLP-1, glucagon-like peptide 1; NADAC, National Average Drug Acquisition Cost. *AWP or NADAC calculated as in Table 9.2; median listed alone when only one product and/or price.

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Insulin Therapy in T2DM

- The progressive nature of T2DM should be regularly & objectively explained to T2DM patients.
- Avoid using insulin as a threat, describing it as a failure or punishment.
- Give patients a self-titration algorithm.

American Diabetes Association Standards of Medical Care in Diabetes.
Approaches to glycemic treatment. Diabetes Care 2017; 40 (Suppl. 1): S64-S74

American Diabetes Association

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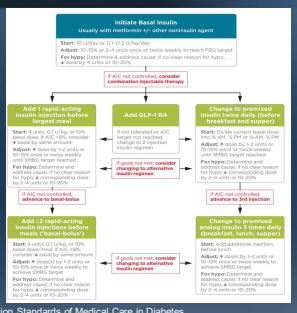
Combination Injectable Therapy in T2DM



American Diabetes Association Standards of Medical Care in Diabetes.
Approaches to glycemic treatment. Diabetes Care 2017; 40 (Suppl. 1): S64-S74

American Diabetes Association

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New Recommendation: Pharmacologic Therapy For T2DM

- In patients with long-standing suboptimally controlled type 2 diabetes and established atherosclerotic cardiovascular disease, empagliflozin or liraglutide should be considered as they have been shown to reduce cardiovascular and all-cause mortality when added to standard care. Ongoing studies are investigating the cardiovascular benefits of other agents in these drug classes. B

American Diabetes Association Standards of Medical Care in Diabetes. Approaches to glycemic treatment. Diabetes Care 2017; 40 (Suppl. 1): S64-S74

American Diabetes Association

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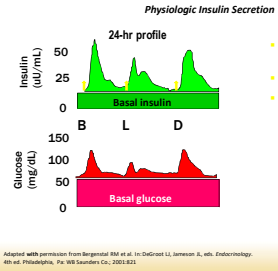
MIMICKING NATURE WITH INSULIN THERAPY BASAL/BOLUS CONCEPT



Adapted with permission from Bergenstal RM et al. In: DeGroot LJ, Jameson JL, eds. *Endocrinology*. 4th ed. Philadelphia, Pa: WB Saunders Co.; 2001:821

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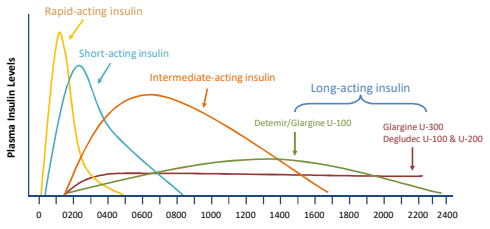
HELPING PATIENTS UNDERSTAND INSULIN REPLACEMENT



Lepore M et al. *Diabetes*. 2000;49:21 42-21 48. Howey DC et al. *Diabetes*. 1994;43:396-402. Plank J et al. *Diabetes Care*. 2005;;28:1107-1112. Wittlin SD et al. *Insulin Therapy*. Marcel Dekker, Inc.;2002:73-85.

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CURRENTLY AVAILABLE BASAL INSULINS

	NPH Insulin	Insulin Glargine U-100 & U-300	Insulin Detemir
Insulin Type	Human; intermediate-acting	Analogue; long-acting	Analogue; long-acting
Onset	2-4 hours	N/A	N/A
Peak	4-10 hours	No pronounced peak	Relatively flat
Effective Duration	10-16 hours	U-100: Up to 24 hrs U-300: Beyond 24 hrs (pen only)	Up to 24 hours

Lilly U500 regular similar in duration of NPH

Lucidi D, et al. *Diabetes Care*. 2011;34:1312-1314.
Niswender K, et al. *Clin Diabetes*. 2009;27:60-68.
Tillner J, *et al*. EASD September 23–27 2013; Barcelona, Spain, (Abstract 1033).
Jax T, *et al*. EASD September 23–27 2013; Barcelona, Spain, (Abstract 1029).

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CURRENTLY AVAILABLE SHORT-ACTING PRANDIAL INSULINS

	Regular Insulin	Insulin Lispro U100 U200 (pen only)	Insulin Aspart	Insulin Glulisine
Insulin type	Human; short-acting	Analogue; rapid acting	Analogue; rapid acting	Analogue; rapid acting
Onset, hr	0.5-1	< 0.3-0.5	< 0.25	< 0.25
Peak, hr	2-3	0.5-2.5	0.5-1.0	1-1.5
Effective duration, hr	3-6	3-6.5	3-5	3-5
Injection: meal timing, min	-30 to -45	-15 to immediately after	-5 to -10	-15 to +20

American Diabetes Association. *Practical Insulin: A Handbook for Prescribing Providers*. 3rd ed. 2011:1-68.

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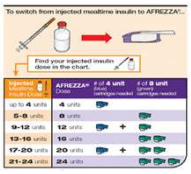
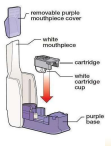
INHALED INSULIN - AFREZZA



Now have 12 unit dosing available



Spirometry prior to starting, at 6 months, and then annually

AFREZZA® [prescribing information]. Bridgewater, NJ: Sanofi-Aventis U.S. LLC; 2015.

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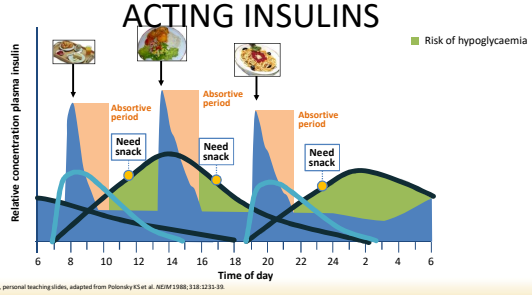
INSULIN REPLACEMENT WITH INTERMEDIATE- AND SHORT-ACTING INSULINS



Aschner P, personal teaching slides, adapted from Polonsky KS et al. *NEJM* 1988;318:1231-39.

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Pharmacologic Therapy for Type 1 Diabetes Management

ADA 2015 Guidelines

Insulin treatment for most patients with type 1 diabetes	• Treat with multiple-dose insulin injections (3-4 injections/day of basal and prandial insulin) or continuous subcutaneous insulin infusion • Match prandial insulin dose to carbohydrate intake, premeal blood glucose, and anticipated activity • Use insulin analogs to reduce risk of hypoglycemia • Consider using sensor-augmented low glucose suspend threshold pump in patients with frequent nocturnal hypoglycemia and/or hypoglycemia unawareness

Other agents	Investigational agents
Pramlinitide (amylin analog) • Delays gastric emptying • Blunts pancreatic secretion of glucagon • Enhances satiety • Induces weight loss • Lowers insulin dose • Use only in adults	Metformin + insulin • Reduces insulin requirements & improves metabolic control in obese/ overweight with poor glycemic control Incretins • GLP-1 receptor agonists • DPP-4 inhibitors SGLT2 inhibitors

Slide covers investigational agents not yet FDA approved for the treatment of type 1 diabetes in the United States

American Diabetes Association. *Diabetes Care*. 2015;38(suppl 1):S1-S93.

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HYPOGLYCEMIA

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CLASSIFICATION OF HYPOGLYCEMIA

Table 6.3—Classification of hypoglycemia (61)

Level	Glycemic criteria	Description
Glucose alert value (level 1)	≤70 mg/dL (3.9 mmol/L)	Sufficiently low for treatment with fast-acting carbohydrate and dose adjustment of glucose-lowering therapy
Clinically significant hypoglycemia (level 2)	<54 mg/dL (3.0 mmol/L)	Sufficiently low to indicate serious, clinically important hypoglycemia
Severe hypoglycemia (level 3)	No specific glucose threshold	Hypoglycemia associated with severe cognitive impairment requiring external assistance for recovery

Glycemic targets. Diabetes Care 2017; 40 (Suppl. 1): S48-S56

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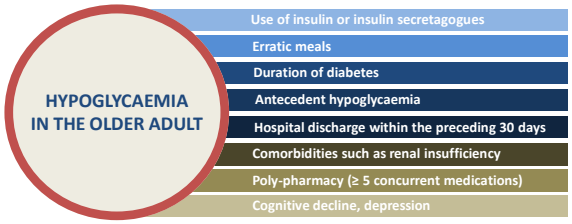
RISK FACTORS FOR HYPOGLYCAEMIA IN THE OLDER ADULT



Shorr RI et al. *Arch Intern Med.* 1997;157:1681–86. ZammittNN, Frier BM. *Diabetes Care.* 2005:28:2948-61.

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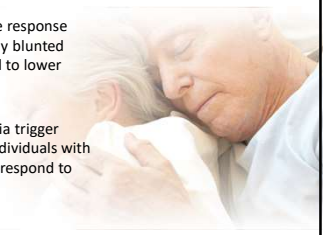
NOCTURNAL HYPOGLYCAEMIA

- During sleep, the neuroendocrine response against hypoglycaemia is markedly blunted (the response threshold is shifted to lower glucose levels)
- While symptoms of hypoglycaemia trigger awakening in healthy subjects, individuals with type 1 diabetes frequently fail to respond to symptoms during sleep



Jauch-Chara K, et al. *Best Pract Res Clin Endocrinol Metab* 2010;24:801-815. Jones TW et al. *N Engl J Med* 1998;338:1657. Banarer S, Cryer PE. *Diabetes* 2003;52:1195.

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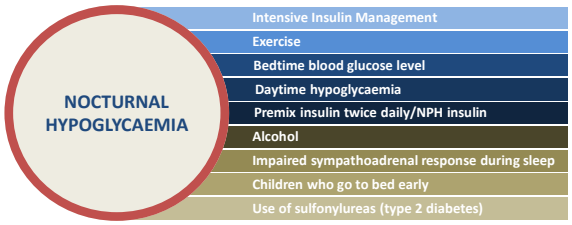
RISK FACTORS FOR NOCTURNAL HYPOGLYCEMIA



Wilson DM et al. **Factors Associated with Nocturnal Hypoglycemia in At-Risk Adolescents and Young Adults with Type 1 Diabetes. Diabet Technol Ther 2015; 17:385-91.**
Bae JP et al. **Risk factors for nocturnal hypoglycemia in insulin-treated patients with type 2 diabetes.** Clin Ther. 2017;39:1790-98.

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HYPOGLYCEMIA

- Individuals at risk for hypoglycemia should be asked about symptomatic and asymptomatic hypoglycemia at each visit
  - At what number do you feel your low blood glucose
  - Have you had any hypoglycemia that required the assistance of another person or glucagon
  - Not limited to only those on insulin

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ADA 2015 Guidelines

Management of Hypoglycemia

At-risk patients	Ask about symptomatic and asymptomatic hypoglycemia at each encounter
Preferred treatment: glucose (15-20 g)* • After 15 mins of treatment, repeat if SMBG shows continued hypoglycemia • When SMBG normal: patient should consume meal or snack to prevent recurrence	
Prescribe glucagon if significant risk of severe hypoglycemia	
Hypoglycemia unawareness or episode of severe hypoglycemia	• Reevaluate treatment regimen • Insulin-treated patients: raise glycemic targets for several weeks to partially reverse hypoglycemia unawareness and reduce recurrence
Low or declining cognition	Continually assess cognitive function with increased vigilance for hypoglycemia

*Any form of glucose-containing carbohydrate can be used; SMBG=self-monitoring of blood glucose

American Diabetes Association. *Diabetes Care*. 2015;38(suppl 1):S1-S93.

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TECHNOLOGY

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INSULIN INFUSION PUMP OPTIONS

Tandem Basal IQ

Medtronic 670G

Omnipod Dash

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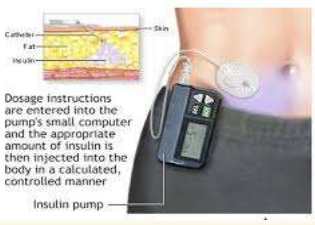
INSULIN PUMP-HOW IT WORKS



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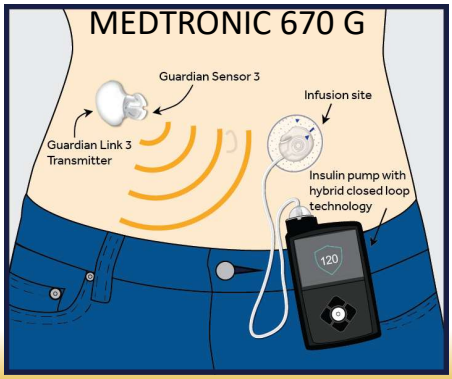
MEDTRONIC 670 G



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TSLIM X2 WITH BASAL IQ

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DEXCOM G6

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DEXCOM PERSONAL KR

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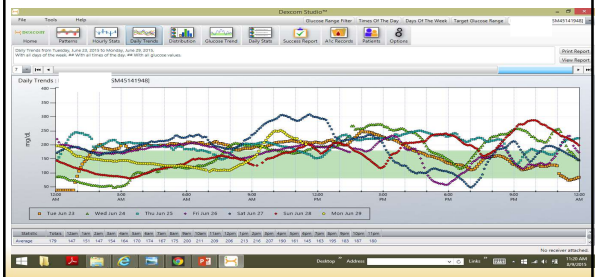
DEXCOM DIAGNOSTIC HS



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FREESTYLE LIBRE

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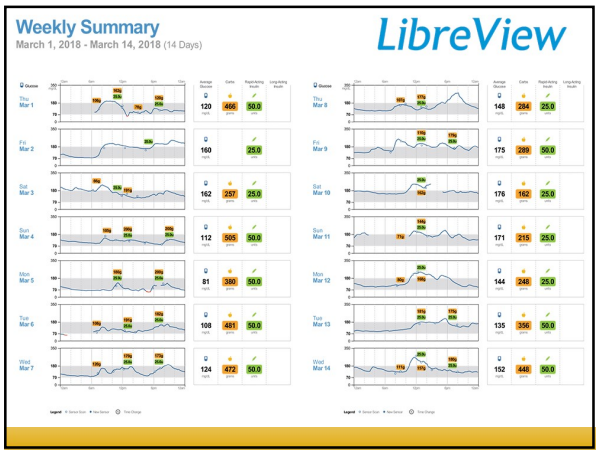

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Recommendations: Glucose Monitoring (2)

- Most patients on multiple-dose insulin (MDI) or insulin pump therapy should do SMBG B
  - Prior to meals and snacks
  - At bedtime
  - Prior to exercise
  - When they suspect low blood glucose
  - After treating low blood glucose until they are normoglycemic
  - Prior to critical tasks such as driving
  - Occasionally postprandially

American Diabetes Association Standards of Medical Care in Diabetes. Glycemic targets. Diabetes Care 2017; 40 (Suppl. 1): S48-S56

American Diabetes Association

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Recommendations: Glucose Monitoring (3)

- When used properly, CGM in conjunction with intensive insulin regimens is a useful tool to lower A1C in selected adults (aged ≥ 25 years) with type 1 diabetes. A
- Although the evidence for A1C lowering is less strong in children, teens, and younger adults, CGM may be helpful in these groups. Success correlates with adherence to ongoing use of the device. B
- CGM may be a supplemental tool to SMBG in those with hypoglycemia unawareness and/or frequent hypoglycemic episodes. C

American Diabetes Association Standards of Medical Care in Diabetes. Glycemic targets. Diabetes Care 2017; 40 (Suppl. 1): S48-S56

American Diabetes Association

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Recommendations: Glucose Monitoring (4)

- Given variable adherence to CGM, assess individual readiness for continuing use of CGM prior to prescribing. E
- When prescribing CGM, robust diabetes education, training, and support are required for optimal CGM implementation and ongoing use. E
- People who have been successfully using CGM should have continued access after they turn 65 years of age. E

American Diabetes Association Standards of Medical Care in Diabetes. Glycemic targets. Diabetes Care 2017; 40 (Suppl. 1): S48-S56

American Diabetes Association

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ADA 2015 Guidelines

Continuous Glucose Monitoring (CGM)

Useful for A1C lowering in select adults (aged ≥25 yrs) with type 1 diabetes requiring intensive insulin regimens	• May be useful among children, teens, and younger adults* • Success related to adherence to ongoing use
May be a useful supplement to SMBG among patients with	• Hypoglycemia unawareness and/or • Frequent hypoglycemic episodes
Variable adherence to CGM	• Assess individual readiness for continuing prior to prescribing • Robust diabetes education, training, support critical for optimal CGM implementation

*Evidence for A1C lowering less strong in these populations
SMBG=self-monitoring of blood glucose

American Diabetes Association. *Diabetes Care*. 2015;38(suppl 1):S1-S93.

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