Type 2 Diabetes Management:
A Case-Based Approach for Primary Care

Kevin M. Pantalone, DO, ECNU, FACE
Professor of Medicine, Cleveland Clinic Lerner College of Medicine
Staff Endocrinologist
Director of Diabetes Initiatives
Department of Endocrinology
Cleveland Clinic
Cleveland, OH

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Disclosure

Consultant: Bayer; Boehringer Ingelheim; Corcept Therapeutics; DIASOME; Eli Lilly; Merck; Novo Nordisk; Sanofi

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Speaker's Bureau: AstraZeneca; Corcept Therapeutics; Novo Nordisk

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Case 1

- A 62-year-old man presents for management of T2D, which was diagnosed 6 years ago.
- Patient takes metformin 1000 mg twice daily.
- Most recent A1C measurement was 9.1%.
- CAD diagnosed 3 years ago, for which he has undergone CABGX3.
- He denies any current symptoms of chest pain or shortness of breath.
- He recently underwent transthoracic echocardiography, and his LVEF was 50%.
- He has a 45 pack-year history of cigarette smoking, but he quit 3 years ago.
- He has HTN, treated with atenolol, 50 mg once daily, and lisinopril/hydrochlorothiazide, 20 mg/12.5 mg once daily, and hyperlipidemia controlled with atorvastatin, 80 mg daily.
- BP 138/84 mm Hg, HR 66 beats/min.
- Weight is 176 lb, BMI = 31 kg/m^2.

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Additional Labs

- Total cholesterol = 112 mg/dL
- LDL cholesterol = 45 mg/dL
- HDL cholesterol = 35 mg/dL
- Triglycerides = 122 mg/dL
- eGFR= 35 mL/min per 1.73 m^2
- UACR= 150 mg albumin/gram creatinine

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Which of the Following Is the Next Best Step in Management of T2D?

A. Start once daily insulin glargine
B. Add once-weekly subcutaneous semaglutide (GLP-1RA)
C. Add empagliflozin (SGLT-2i)
D. Add glipizide XL

Subcutaneous Semaglutide

- Of the options listed, the best next step is to add once-weekly subcutaneous semaglutide (Answer B)
- Semaglutide is approved to reduce the risk of major adverse cardiovascular events (cardiovascular death, nonfatal myocardial infarction, or nonfatal stroke) in adults with T2D and established CVD
- Recently demonstrated renal outcome benefits in T2D and CKD (FLOW) and now has indication to reduce the risk of worsening kidney disease, kidney failure, and death due to cardiovascular disease in adults with T2D and CKD
- Oral semaglutide
  - CV safety of oral semaglutide established in PIONEER-6
  - SOUL study just finished and demonstrated oral version also affords CV risk reduction (not yet FDA approve/added to label)

Marso SP et al. N Engl J Med. 2016;375(19):1834-1844.
Husain M et al. N Engl J Med. 2019; 381:841-851.
McGuire DK et al. N Engl J Med. 2025 Mar 29. doi: 10.1056/NEJMoa2501006.

GLP-1RA and Renal Benefit?

Trial	Year Published	Treatment (s)	Primary or Secondary	Kidney Outcome	Results
LEADER [39]	2016	Liraglutide vs. placebo	Secondary	Diabetic Nephropathy	HR 0.78 (95% CI 0.67–0.92)
SUSTAIN-6 [40]	2016	Semaglutide vs. placebo	Secondary	Macroalbuminuria, doubling of serum creatinine, Creatinine clearance ≤ 45 mL/min or KRT	HR 0.64 (95% CI 0.46–0.88)
AWARD-7 [41]	2018	Dulaglutide vs. insulin glargine	Secondary	eGFR and UACR	A decline in eGFR of the insulin arm but not in the higher-dose dulaglutide arm
REWIND [42]	2019	Dulaglutide vs. placebo	Secondary	300 mg/g > UACR in lower baseline concentration, sustained 30% > eGFR decline, KRT	HR 0.85 (95% CI 0.77–0.93)
Kristensen et. al. meta-analysis [43]	2019	GLP-1′s	—	New-onset macroalbuminuria, decline in eGFR, progression of kidney disease or death of kidney cause	HR 0.83 (95% CI 0.78–0.89)
AMPLITUDE-O [44]	2021	Efpeglenatide vs. placebo	Secondary	Incident microalbuminuria > 300mg/g, increase in UACR of at least 30% from baseline, sustained eGFR decrease > 40% for > 30 days, KRT for 90 days or more, eGFR < 15 for 30 days or more	HR 0.68 (95% CI 0.57–0.79)

Sawaf H et al. J Clin Med. 2022;11(2):378.

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Effects of Semaglutide on CKD in Patients with T2D: The Flow Trial

- Randomly assigned patients with T2D and CKD to receive subcutaneous semaglutide at a dose of 1.0 mg weekly or placebo. CKD defined by the following:
- eGFR of 50 to 75 ml per minute per 1.73 m2 and a UACR of >300 and <5000 mg/g

  or
- eGFR of 25 to <50 ml per minute per 1.73 m2 and a UACR >100 and <5000 mg/g
- The primary outcome was major kidney disease events
  - A composite of the onset of kidney failure (dialysis, transplantation, or an eGFR of <15 ml per minute per 1.73 m2), at least a 50% reduction in the eGFR from baseline, or death from kidney-related or cardiovascular causes.
- Prespecified confirmatory secondary outcomes were tested hierarchically

Perkovic V et al. N Engl J Med. 2024 Jul 11;391(2):109-121.

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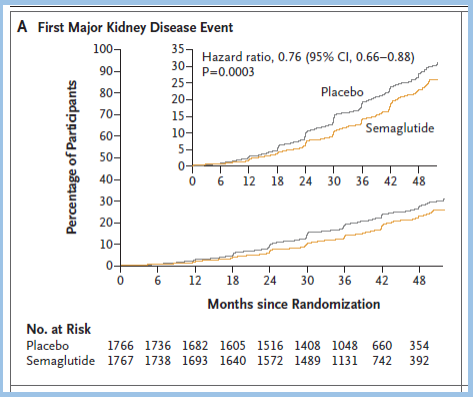
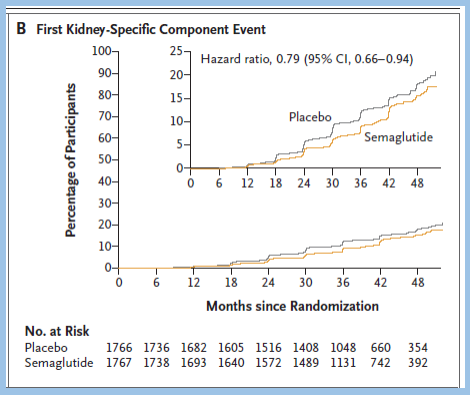
The Flow Trial





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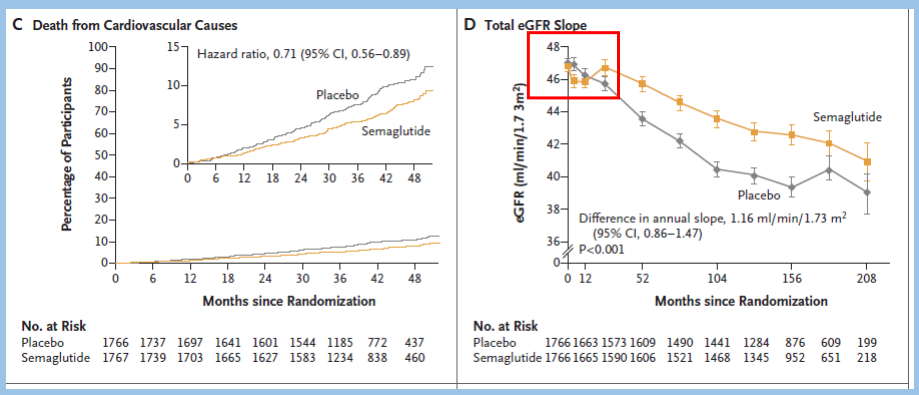
The Flow Trial



CONCLUSIONS

Semaglutide reduced the risk of clinically important kidney outcomes and death from cardiovascular causes in patients with type 2 diabetes and chronic kidney disease.

Perkovic V et al. N Engl J Med. 2024 Jul 11;391(2):109-121.

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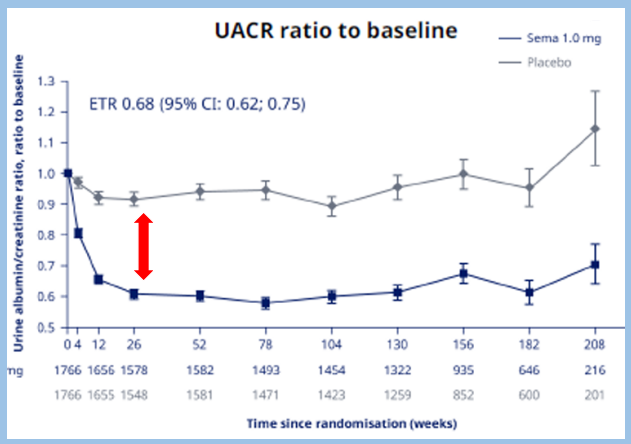
Flow Trial: UACR



Perkovic V et al. N Engl J Med. 2024 Jul 11;391(2):109-121.

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Why Not Add SGLT-2i?

- CV risk reduction
- CKD risk reduction
- CHF risk reduction
- SGLT-2i medications are great, no doubt!
- Would have been a great option to provide outcome benefits in this patient……..but GLP-1RA would allow us to achieve that and more:
  - Consider A1C lowering effect of GLP-1RA vs. SGLT-2i, particularly in patients with lower eGFRs where the efficacy of SGLT-2i on glycemic control are reduced
  - Weight reduction with GLP-1RA vs. SGLT-2i
  - GLP-RA (sc semaglutide) would provide the CKD and CVD risk reduction and be far more likely to get the A1C < 7% and provide greater chance of achieving a clinically significant weight loss

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Aspect	GLP-1 Receptor Agonists	SGLT-2 Inhibitors
Mechanism of Action	Stimulate insulin secretion in response to glucose, suppress glucagon release, slow gastric emptying, and enhance satiety.	Inhibit sodium-glucose cotransporter 2 in the kidneys, preventing glucose reabsorption, leading to increased glucose excretion in urine.
Effect on Glycemic Control	- Significant reduction in HbA1c - Reduces postprandial and fasting blood glucose levels	- Significant reduction in HbA1c (eGFR ≥ 45) - Reduces postprandial and fasting glucose levels, but largest effect is on lowering postprandial glucose
Average HbA1c Change	- Reduces HbA1c by 1.0% to 1.8% (depending on the agent and dose)	- Reduces HbA1c by 0.5% to 1.2%
Effect on Weight Loss	- Significant weight loss (average of 5-10% body weight) due to appetite suppression and slower gastric emptying	- Moderate weight loss (3-5% body weight) due to caloric loss from glucose excretion in urine
Onset of Action	- Onset of action can be gradual; typically takes a few weeks to months for optimal effects	- Onset is generally quicker (within days), with sustained effects
Side Effects	- Nausea, vomiting, diarrhea, constipation, risk of pancreatitis, possible risk of thyroid tumors (in animal studies)	- Urinary tract infections, genital fungal infections, increased urination, dehydration, hypotension
Cardiovascular Effects	- Some agents (e.g., liraglutide, dulaglutide, semaglutide) show positive effects on cardiovascular outcomes (e.g., reduced risk of cardiovascular events)	- Proven benefits in reducing cardiovascular risk (e.g., empagliflozin, canagliflozin)
Renal Effects	- Reduce albuminuria and reduce risk of progression of CKD - Semaglutide	- Reduce albuminuria and reduce risk of progression of CKD
Risk of Hypoglycemia	- Low risk of hypoglycemia when used alone, but risk increases when combined with other insulin-stimulating agents or insulin	- Very low risk of hypoglycemia, as they don't increase insulin secretion, but background therapies (SFUs or insulin) may need adjusted
Preferred Patient Populations	- Type 2 diabetes with obesity or those needing weight loss, particularly if cardiovascular protection (and/or CKD risk reduction) is needed	- Type 2 diabetes with cardiovascular disease, heart failure, or CKD

GLP-1 receptor agonists generally lead to a more substantial reduction in HbA1c (1.0% to 1.8%) compared to **SGLT-2 inhibitors** (0.5% to 1.2%).
•Both classes are effective in improving **glycemic control**, but GLP-1 receptor agonists may offer a slightly greater reduction in HbA1c
•particularly in setting of lower eGFR values (< 45)

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SGLT-2i Efficacy and eGFR

SGLT-2 inhibitors still offer moderate glycemic control benefits as eGFR drops, but their efficacy diminishes significantly at lower eGFR levels

1. **eGFR > 45-60 mL/min/1.73m²**: SGLT-2 inhibitors are most effective in this range, with robust HbA1c lowering and additional benefits for kidney function
2. **eGFR 30-45 mL/min/1.73m²**: The HbA1c lowering effect is **reduced**, but **diabetic kidney disease** and **heart failure** patients can still benefit, and careful monitoring is essential
3. **eGFR < 30 mL/min/1.73m²**: At this stage, SGLT-2i are added for CHF and CKD benefits, and can continued all the way down to start of dialysis
   - However, eGFR > 20 at time of initiation recommended for empagliflozin and > 25 for dapagliflozin

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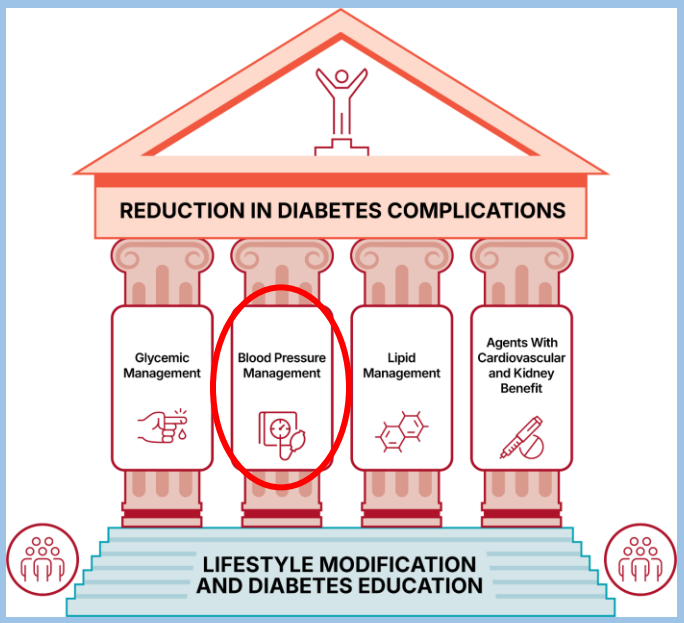
Cardiovascular Disease and Risk Management



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Case 1 Continued

- Blood Pressure: 138/84 mmHg
- What is the target?
- Are we at goal?

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Hypertension Guidelines 2025

10.1 Hypertension is defined as a systolic blood pressure ≥130 mmHg or a diastolic blood pressure ≥80 mmHg based on an average of two or more measurements obtained on two or more occasions. A

10.4 The on-treatment blood pressure goal is <130/80 mmHg, if it can be safely attained. A

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Randomized Controlled Trials of Intensive versus Standard Hypertension Treatment Strategies

Table 10.1—Randomized controlled trials of intensive versus standard hypertension treatment strategies

Clinical trial	Population	Intensive	Standard	Outcomes
ACCORD BP (35)	4,733 participants with T2D aged 40–79 years with prior evidence of CVD or multiple cardiovascular risk factors	SBP target: <120 mmHg Achieved (mean) SBP/DBP: 119.3/64.4 mmHg	SBP target: 130–140 mmHg Achieved (mean) SBP/DBP: 135/70.5 mmHg	• No benefit in primary end point: composite of nonfatal MI, nonfatal stroke, and CVD death • Stroke risk reduced 41% with intensive control, not sustained through follow-up beyond the period of active treatment • Adverse events more common in intensive group, particularly elevated serum creatinine and electrolyte abnormalities
ADVANCE (36)	11,140 participants with T2D aged ≥55 years with prior evidence of CVD or multiple cardiovascular risk factors	Intervention: a single-pill, fixed-dose combination of perindopril and indapamide Achieved (mean) SBP/DBP: 136/73 mmHg	Control: placebo Achieved (mean) SBP/DBP: 141.6/75.2 mmHg	• Intervention reduced risk of primary composite end point of major macrovascular and microvascular events (9%), death from any cause (14%), and death from CVD (18%) • 6-year observational follow-up found reduction in risk of death in intervention group attenuated but still significant (242)
HOT (37)	18,790 participants, including 1,501 with diabetes	DBP target: ≤80 mmHg Achieved (mean): 81.1 mmHg, ≤80 group; 85.2 mmHg, ≤90 group	DBP target: ≤90 mmHg	• In the overall trial, there was no cardiovascular benefit with more intensive targets • In the subpopulation with diabetes, an intensive DBP target was associated with a significantly reduced risk (51%) of CVD events

Cardiovascular Disease and Risk Management: Standards of Care in Diabetes - 2023. Diabetes Care 2023;46(Suppl. 1):S158-S190

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Randomized Controlled Trials of Intensive versus Standard Hypertension Treatment Strategies

SPRINT (43)	9,361 participants without diabetes	SBP target: <120 mmHg Achieved (mean): 121.4 mmHg	SBP target: <140 mmHg Achieved (mean): 136.2 mmHg	• Intensive SBP target lowered risk of the primary composite outcome 25% (MI, ACS, stroke, heart failure, and death due to CVD) • Intensive target reduced risk of death 27% • Intensive therapy increased risks of electrolyte abnormalities and AKI
STEP (34)	8,511 participants aged 60–80 years, including 1,627 with diabetes	SBP target: <130 mmHg Achieved (mean): 127.5 mmHg	SBP target: <150 mmHg Achieved (mean): 135.3 mmHg	• Intensive SBP target lowered risk of the primary composite outcome 26% (stroke, ACS [acute MI and hospitalization for unstable angina], acute decompensated heart failure, coronary revascularization, atrial fibrillation, or death from cardiovascular causes) • Intensive target reduced risk of cardiovascular death 28% • Intensive therapy increased risks of hypotension

ACCORD BP, Action to Control Cardiovascular Risk in Diabetes Blood Pressure trial; ACS, acute coronary syndrome; ADVANCE, Action in Diabetes and Vascular Disease: Preterax and Diamicron MR Controlled Evaluation; AKI, acute kidney injury; CVD, cardiovascular disease; DBP, diastolic blood pressure; HOT, Hypertension Optimal Treatment trial; MI, myocardial infarction; SBP, systolic blood pressure; SPRINT, Systolic Blood Pressure Intervention Trial; STEP, Strategy of Blood Pressure Intervention in the Elderly Hypertensive Patients; T2D, type 2 diabetes.

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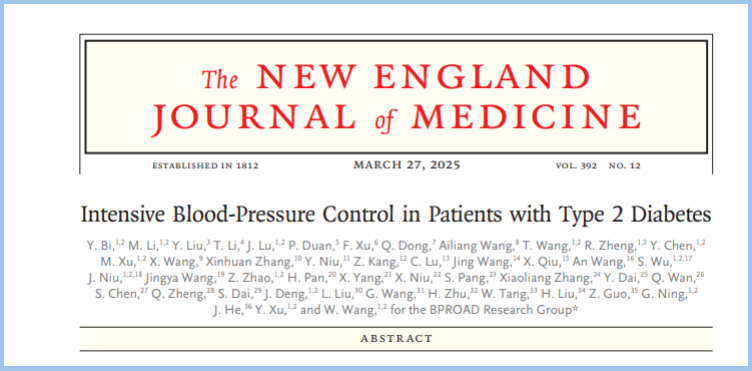
Intensive Blood-Pressure Control in Patients with Type 2 Diabetes



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Intensive Blood-Pressure Control in Patients with Type 2 Diabetes

Y. Bi, M. Li, Y. Liu, T. Li, J. Lu, P. Duan, F. Xu, Q. Dong, Ailiang Wang, T. Wang, R. Zheng, Y. Chen, M. Xu, X. Wang, Xinhuan Zhang, Y. Niu, Z. Kang, C. Lu, Jing Wang, X. Qiu, An Wang, S. Wu, J. Niu, Jingya Wang, Z. Zhao, H. Pan, X. Yang, X. Niu, S. Pang, Xiaoliang Zhang, Y. Dai, Q. Wan, S. Chen, Q. Zheng, S. Dai, J. Deng, L. Liu, G. Wang, H. Zhu, W. Tang, H. Liu, Z. Guo, G. Ning, J. He, Y. Xu, and W. Wang, for the BPROAD Research Group*

ABSTRACT

N Engl J Med 2025;392:1155-67

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Intensive Blood-Pressure Control in Patients with Type 2 Diabetes

Patients

People with T2D and a history of clinical cardiovascular disease at least 3 months before enrollment in the trial, subclinical cardiovascular disease within 3 years before enrollment, two or more cardiovascular disease risk factors, and chronic kidney disease (CKD) with an eGFR of 30 to less than 60 ml per minute per 1.73 m2

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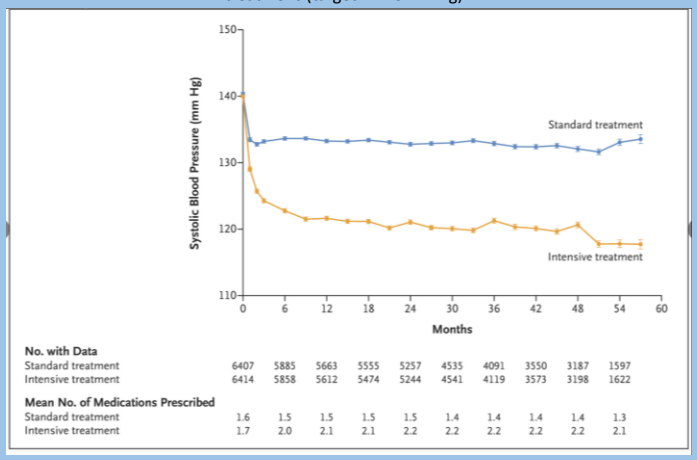
Intensive Blood-Pressure Control in Patients with Type 2 Diabetes

Treatment

Intensive antihypertensive treatment (systolic BP target <120 mmHg) or standard treatment (target < 140 mmHg)



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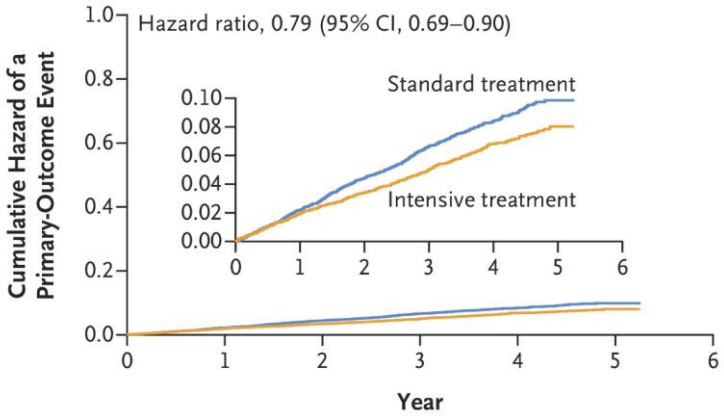
Intensive Blood-Pressure Control in Patients with Type 2 Diabetes

Outcomes

The primary outcome was a composite of nonfatal stroke, nonfatal myocardial infarction, treatment or hospitalization for heart failure, or death from cardiovascular causes.



No. at Risk

Standard treatment	6407	6087	5814	4626	3674	132
Intensive treatment	6414	6092	5871	4692	3738	112

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Intensive Blood-Pressure Control in Patients with Type 2 Diabetes

Adverse Events

Table 3. Adverse Events.*

Outcome	Intensive Treatment (N=6414)		Standard Treatment (N=6407)		Hazard Ratio (95% CI)	P Value
	No. of Events	Percentage of Participants	No. of Events	Percentage of Participants		
Serious adverse event†	2340	36.5	2328	36.3	1.00 (0.94–1.06)	0.96
Conditions of interest‡						
Arrhythmia	69	1.1	68	1.1	1.01 (0.72–1.41)	0.95
Electrolyte abnormality	36	0.6	35	0.6	1.03 (0.65–1.64)	0.91
Injurious fall	65	1.0	61	1.0	1.06 (0.75–1.51)	0.74
Symptomatic hypotension	8	0.1	1	<0.1	7.92 (0.99–63.34)	0.05
Syncope	10	0.2	10	0.2	1.00 (0.41–2.39)	0.99
Acute renal failure	4	0.1	5	0.1	0.79 (0.21–2.95)	0.73
Clinical safety alerts§						
Serum sodium <130 mmol/liter	46	0.7	47	0.8	0.97 (0.65–1.46)	0.89
Serum sodium >150 mmol/liter	22	0.4	25	0.4	0.88 (0.49–1.56)	0.65
Serum potassium <3.0 mmol/liter	32	0.5	33	0.5	0.97 (0.60–1.58)	0.90
Serum potassium >5.5 mmol/liter	177	2.8	125	2.0	1.41 (1.12–1.77)	0.003

* Patients were counted only once for each adverse event.
† Serious adverse events were events that were fatal or life-threatening, resulted in substantial or persistent disability, resulted in or prolonged hospitalization, or were important medical events that investigators judged to represent substantial hazards or harm to research participants.
‡ Conditions of interest were a selected list of events that were serious adverse events or led to an emergency department visit.
§ Data were missing for 184 patients in the intensive-treatment group and 187 patients in the standard-treatment group.

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Intensive Blood-Pressure Control in Patients with Type 2 Diabetes

Conclusion

Among patients with type 2 diabetes, the incidence of major cardiovascular events was significantly lower with intensive treatment targeting a systolic blood pressure of less than 120 mm Hg than with standard treatment targeting a systolic blood pressure of less than 140 mm Hg

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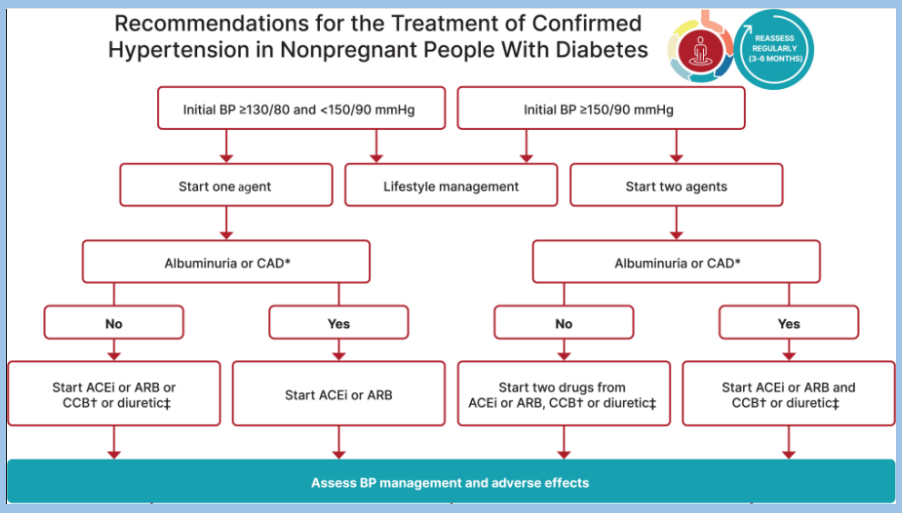
Recommendations for the Treatment of Confirmed Hypertension in Nonpregnant People with Diabetes



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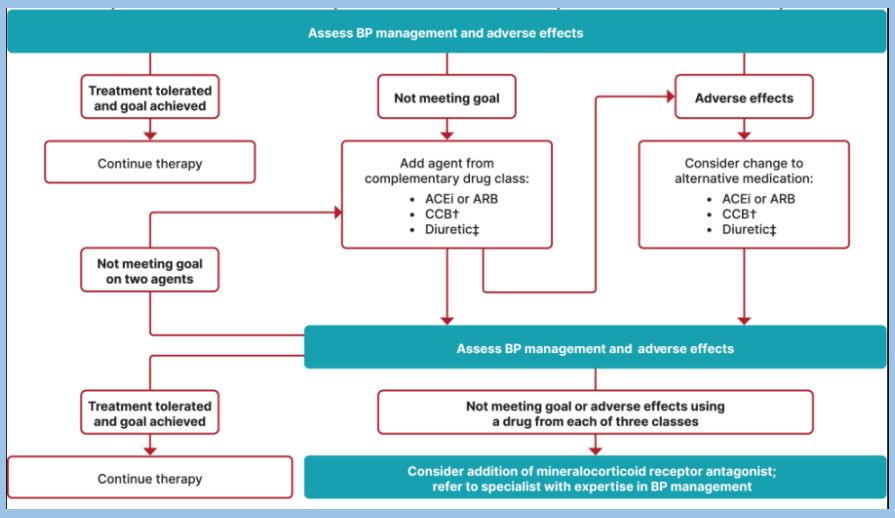
Recommendations for the Treatment of Confirmed Hypertension in Nonpregnant People with Diabetes



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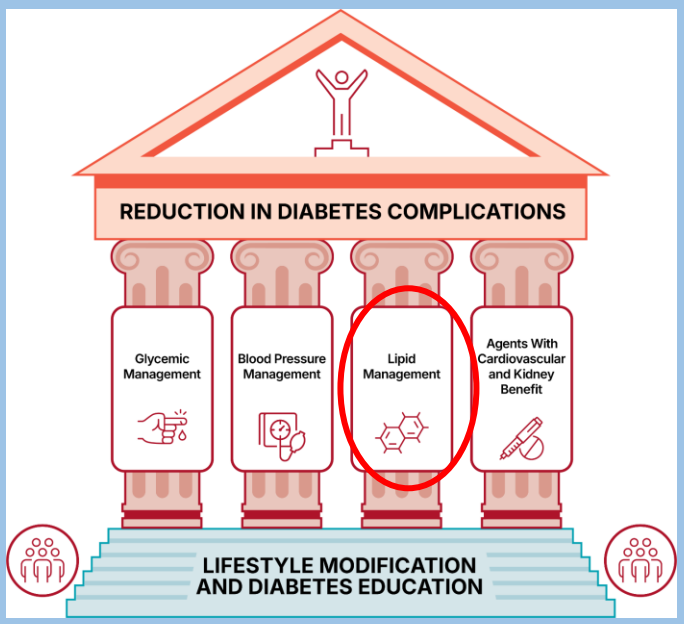
Cardiovascular Disease and Risk Management



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Case 1 Continued

- LDL 45 mg/dL
- Patient had CAD diagnosed 3 years ago s/p CABGX3
- Are we at goal?

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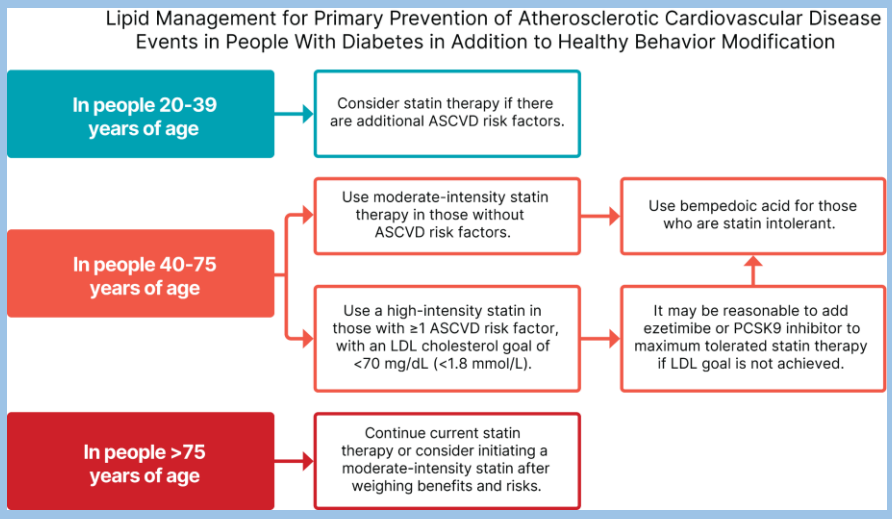
Lipid Management
Statin Treatment—Primary Prevention



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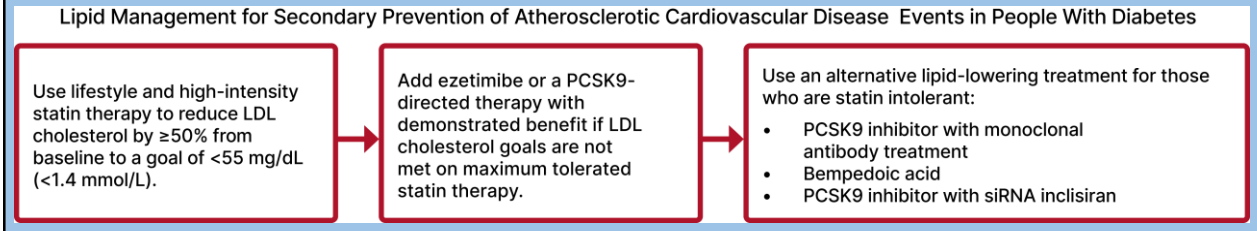
Lipid Management
Statin Treatment—Secondary Prevention



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Case 2

- A 59-year-old man returns for continued management of T2D, which was diagnosed 15 years ago.
- He was initially treated with oral agents, but he has been receiving insulin therapy for the past 5 years.
- His A1C level has ranged from 7.0% to 9.0% over the past few years.
- Most recent A1C measurement was 7.3%.
- He has chronic kidney disease and macroalbuminuria.
- Peripheral neuropathy is well controlled with pregabalin.
- He also has hypertension and hyperlipidemia.

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Case 2: Current Meds

Metformin, 1000 mg twice daily
Insulin aspart, 10 units before meals (3 times daily)
Insulin degludec, 30 units at bedtime
Lisinopril, 40 mg daily
Aspirin, 81 mg daily
Clopidogrel, 75 mg daily
Metoprolol tartrate, 50 mg twice daily
Chlorthalidone, 25 mg once daily
Rosuvastatin, 10 mg once daily

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Case 2

Physical Exam

- Weight is 225 lbs, BMI = 34 kg/m^2
- BP 134/82 mm Hg, HR 74 bpm
- 1+ pitting edema and 2+ dorsalis pedis pulse in the bilateral lower extremities
- His lungs are CTAX2, and heart RRR with no audible murmur
- There is decreased sensation to 10-g monofilament testing on the distal plantar aspect of his feet bilaterally

Laboratory test results

- Electrolytes, normal
- Serum Cr 1.5 mg/dL (0.7-1.3)
- eGFR 50 mL/min per 1.73 m^2
- HbA1C= 7.3%
- Urine albumin-to-creatinine ratio = 520 mg/g Cr
  - Normal: <30 mg/g Cr

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Which of the Following Medications Should Be Started as the Best Next Step in This Patient's Treatment?

A. Losartan
B. Aliskiren
C. Amlodipine
D. Dapagliflozin

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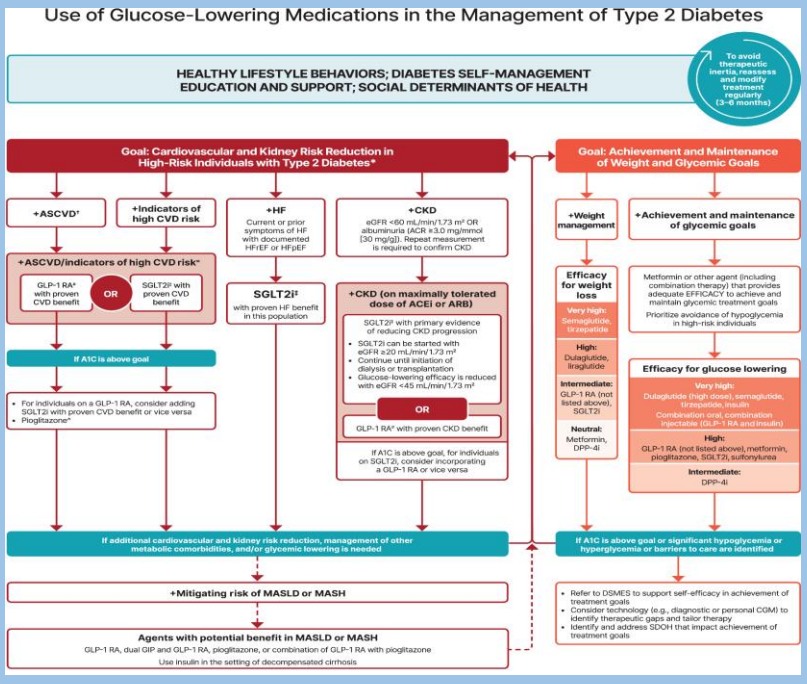

*In People with HF, CKD, Established CVD, or Multiple Risk Factors for CVD, the Decision to Use a GLP-1RA or SGLT-2i with Proven Benefit Should Be Made Irrespective of Background Use of Metformin or A1C

9. Pharmacologic Approaches to Glycemic Treatment: Standards of Care in Diabetes—2025; Diabetes Care 2025;48(Supplement_1):S181–S206.

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Correct Answer (D) Dapagliflozin (SGLT-2i)

- This patient has T2D, CKD, and macroalbuminuria
- Patient had A1C of 7.3%
  - Even if A1C was < 7% still an indication to initiate an SGLT-2i for renal risk reduction
  - Nicely compliment regimen of insulin therapy (MDI) to help reduce glycemic variability
  - SGLT-2i will provide a way of the body to dispose of excess glucose independent of insulin action (complementary and synergistic effect)
- BP above target
  - Likely will obtain mild BP lowering effect with SGLT-2i in this patient

Heerspink HJL et al. N Engl J Med 2020; 383:1436-1446.

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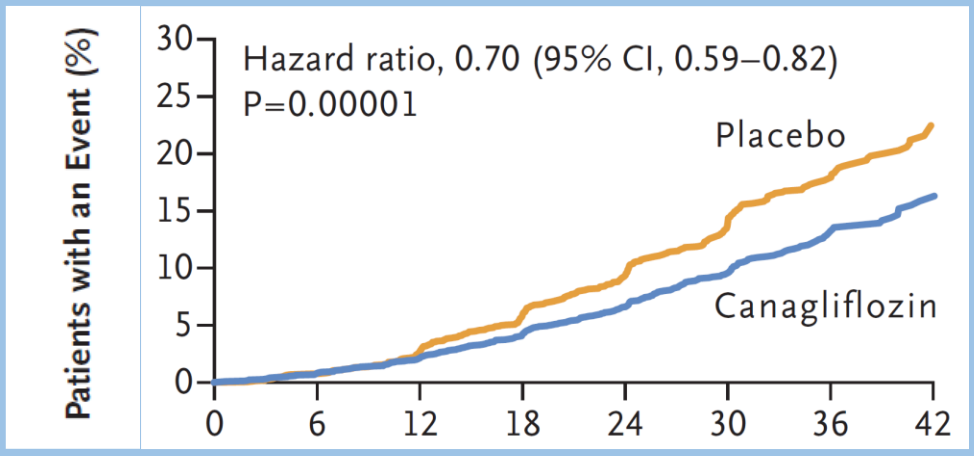
CREDENCE-Renal Outcomes*

Primary Outcome: ESKD, Doubling of Serum Cr, Renal Death, CV Death



All patients had T2D, eGFR 30-90 mL/min/1.73m^2 and urinary albumin:Cr > 300 to 5000 mg/g, and were treated with renin-angiotensin system blockade (ACE/ARB)

Perkovic V et al. N Engl J Med. 2019 Jun 13;380(24):2295-2306.

* Included only patients with T2D

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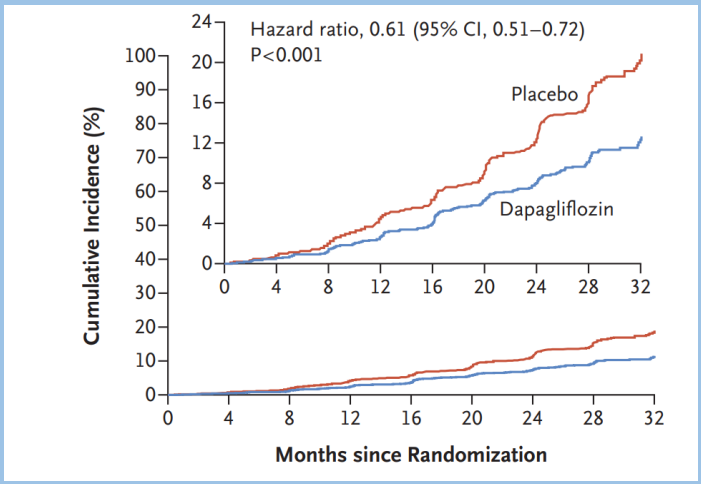
DAPA-CKD*

Primary Composite Outcome: Sustained ≥50% eGFR Decline, ESKD, Renal or CV Death



All patients had eGFR 25-75 mL/min/1.73m² and urinary albumin:Cr ratio > 200 to 5000 mg/g

Heerspink HJL et al. N Engl J Med 2020; 383:1436-1446.

*Included patients with and without T2D

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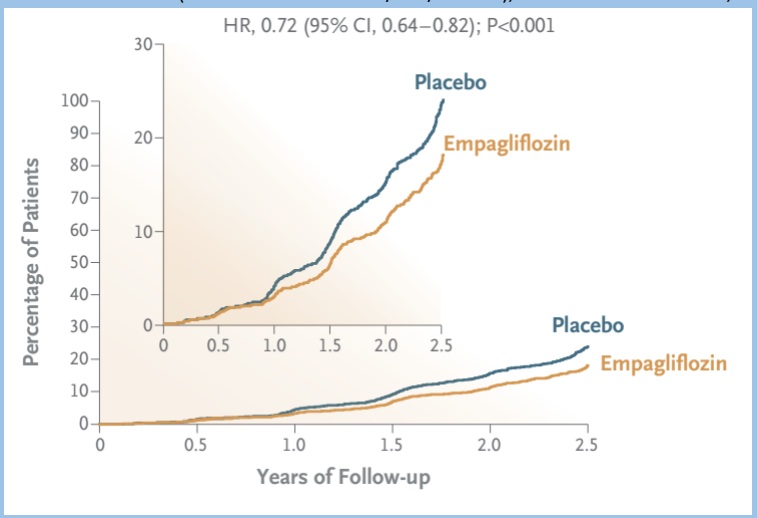
EMPA-Kidney*

Primary Composite Outcome: ESKD (sustained eGFR <10 mL/min/1.73 m²), sustained of ≥40% eGFR, renal or CV death



All patients had eGFR 20 to <45 mL/min/ 1.73m²eGFR or 45 to <90 mL/min 1.73 m² and urinary alb:Cr ratio of at least 200 mg/g

Empa-Kidney Collaborative Group. 2023 Jan 12;388(2):117-127.

*Included patients with and without T2D

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Other Answer Options

A) In the ONTARGET trial, the combination of ACE/ARB was associated with more adverse events without an increase in benefit. For these reasons, addition of the ARB losartan is incorrect. ACE/ARB combination therapy is not recommended.

B) Aliskiren, a direct renin inhibitor, should not be added to the regimen of a patient treated with an ACE inhibitor or ARB. The ALTITUDE study (Aliskiren Trial in T2D Using Cardiorenal Endpoints) failed to identify a benefit of aliskiren as an adjunct to therapy with an ACE inhibitor or an ARB and found that vs. placebo, aliskiren was associated with more cases of nonfatal stroke, renal complications, hyperkalemia, and hypotension.

C) Amlodipine may lower BP < 130/80, but will not provide the significant reduction in UACR afforded by RAASi or SGLT-2i, and will not address the residual A1C elevation observed in this patient. If BP remained above target, despite SGLT-2i, this would be a reasonable option.

Parving H et al. N Engl J Med 2012; 367:2204-2213.
Yusuf S et al. ONTARGET Investigators. N Engl J Med. 2008;358(15):1547-1559.

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Glycemic Control Is Still Important!

- HbA1c: Average glycemia during the past 3 months
- Continuous glucose monitors provide real-time feedback to patients in terms of their BG control, and often pick up more detailed information regarding overall BG control, via Time-in-Range, than the HbA1c alone
- CGM allows one to identify the areas where improved glycemic control are necessary, or unrecognized hypoglycemia

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BGM vs CGM

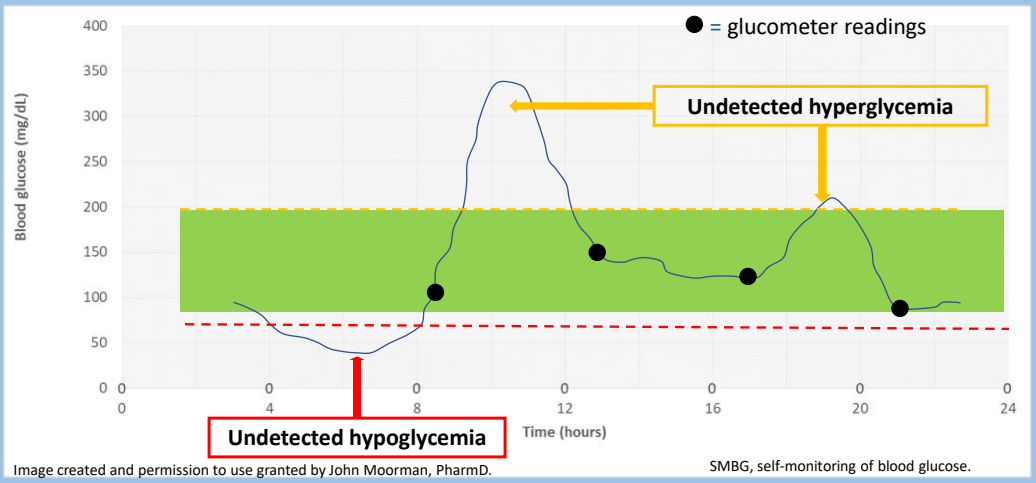

Image created and permission to use granted by John Moorman, PharmD.

SMBG, self-monitoring of blood glucose.

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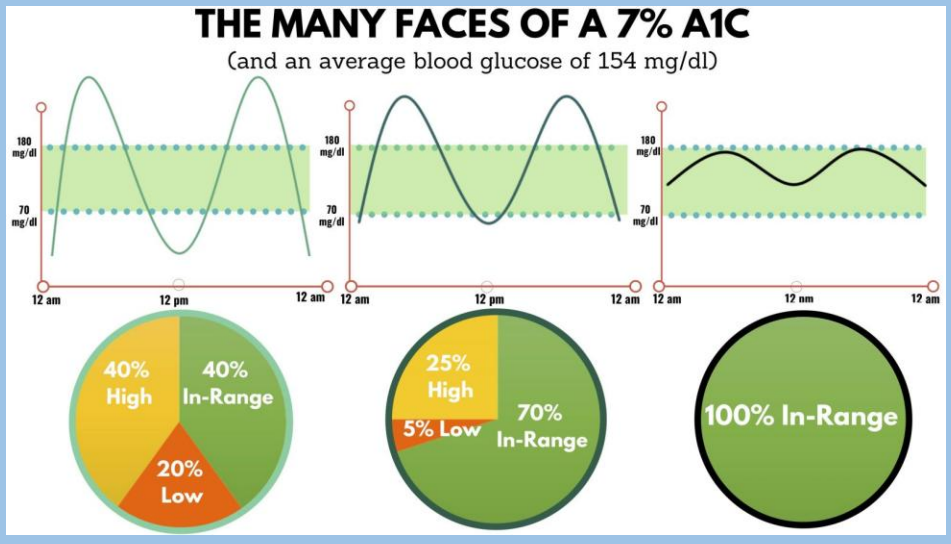
A1C Alone Is Often Not Enough



https://diatribe.org/time-range.

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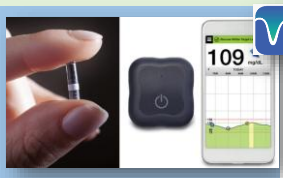
Personal CGM Options

Owed by the person with diabetes → Typically used long term → Device options include real-time glucose monitoring (rtCGM) or intermittent scanning (isCGM) → Some options can be integrated with insulin pumps or connected insulin pens

Freestyle Libre 2 and Libre 2+

Freestyle Libre 3 and Libre 3+



Eversense E3

Guardian Connect or Guardian 3 or 4

Dexcom G6

Dexcom G7

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Personal CGM Comparison

	Dexcom G6	Dexcom G7	Libre 2+	Libre 3+	Guardian 4	Eversense 365
Type	rtCGM	rtCGM	isCGM	rtCGM	rtCGM	rtCGM
Maximum wear time	10 days	10.5 days	15 days		7 days	365 days
Warm-up time	2 hours	<30 min	1 hour		<2 hours	24 hours
Calibrations	Optional	Optional	None		Optional	After 14 days, Weekly
Water Depth	8 feet, 24 hours	8 feet, 24 hours	3 feet 30 min		8 feet 30 min	3.28 feet 30 min
Data Platform	Dexcom Clarity		Libre View		Carelink	Eversense Data Management System

Is: intermittently scanned
Rt: real time
Dexcom recently FDA approved for 15 days: https://www.diabetech.info/p/dexcom-g7-gets-fda-clearance-for-15-day-wear-but-will-it-actually-last-that-long

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Personal CGM Comparison (Continued)

	Dexcom G6	Dexcom G7	Libre 2+ Libre 3+	Guardian 4	Eversense
FDA approved sites	Abdomen (ages2+) Upper buttocks (ages 2-17)	Upper arm (ages 7+) Upper buttocks (ages 2-6)	Upper arm	Upper arm, abdomen Upper buttocks (ages 2-13)	Upper arm
Approved in pregnancy	No	Yes	Yes	No	No
Transmitter	3 months	Disposable	Disposable	Charge weekly	Charge daily
FDA approved ages (years)	≥2	≥2	≥2	≥2	≥18
Drug interactions	Hydroxyurea	Hydroxyurea	Vitamin C	Acetaminophen Hydroxyurea	Tetracycline antibiotics, mannitol
Insulin Pump Compatibility	Omnipod 5, iLet, Mobi, T:Slim X2	Omnipod 5, iLet, Mobi, T:Slim X2	T:Slim X2 Omnipod 5, iLet	Medtronic 780G	Sequel Twist

Product user guides: Dexcom G6, Dexcom G7, Libre 2, Libre 3, Medtronic Guardian Connect, Guardian 4, Eversense

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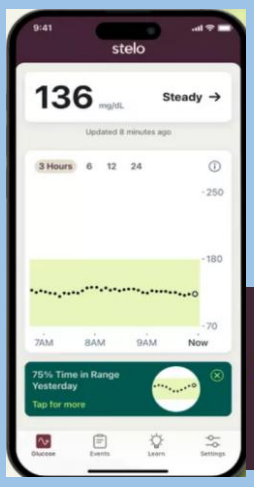
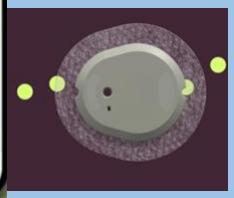
OTC CGMs

Abbott Lingo

Seems more geared to athletes or "health nuts"



Dexcom Stelo



- Can be purchased online without a prescription
- There are no real time alerts, price is ~$89-$99/month and they are meant for people not taking insulin
- The Abbot Rio will be coming out in the future, another OTC option for people with diabetes not taking insulin

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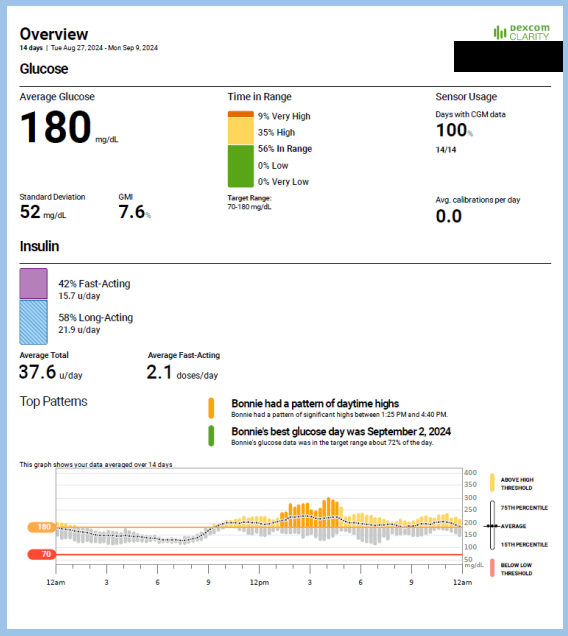
65-year-old Woman, T2D, on MDI, A1c 6.5%



Illustrates higher average glucose, time above range despite “well controlled A1c”

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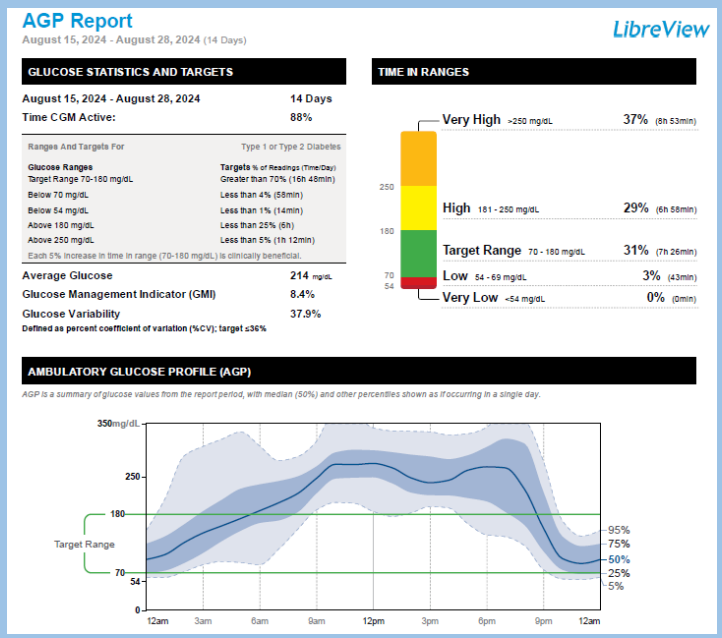
59-year-old Woman, T2D, on Basal Insulin, Metformin, SGLT-2i, Recently Started GLP-1RA, A1c 8.2%



Average glucose in CGM lines up with A1C, but illustrates that A1c cannot capture variability and hypoglycemia

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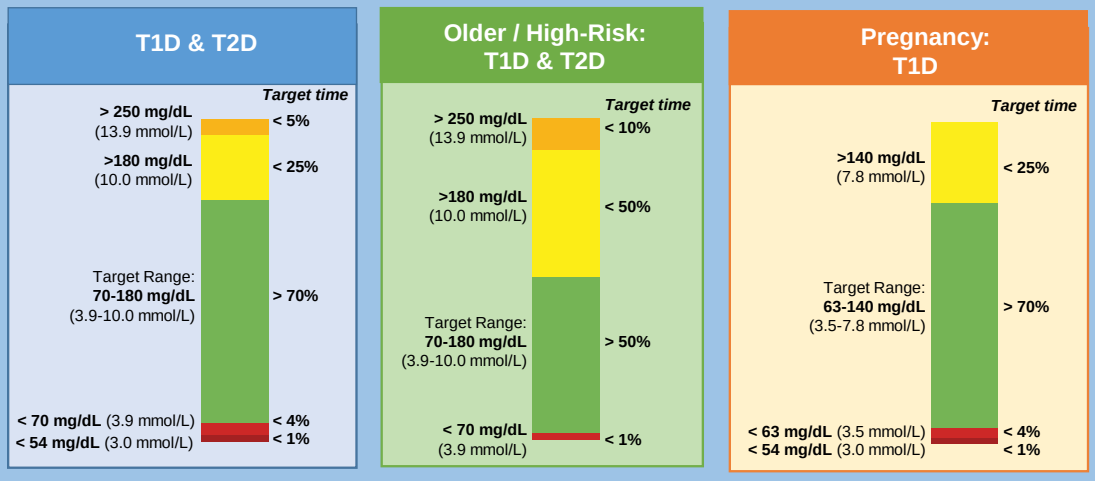
Time in Range



1% of the day is ≈15 minutes.

Battelino T et al. Diabetes Care. 2019;42(8):1593-1603.

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Conclusions

- A1C reduction/goal attainment is **STILL** important
  - How you get there is important too!
- CV (and Renal) Risk Reduction with GLP-1RA
- CV, Renal, and HF risk reduction with SGLT-2i
- BP and LDL targets must be prioritized
- CGM can assist both patients and providers in improving glycemic control

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