Updates in Diabetes and Cardiovascular Disease Management: Are You Making the Link?

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The speakers have no actual or potential conflicts of interest in relation to this activity.

Learning Objectives - Pharmacist

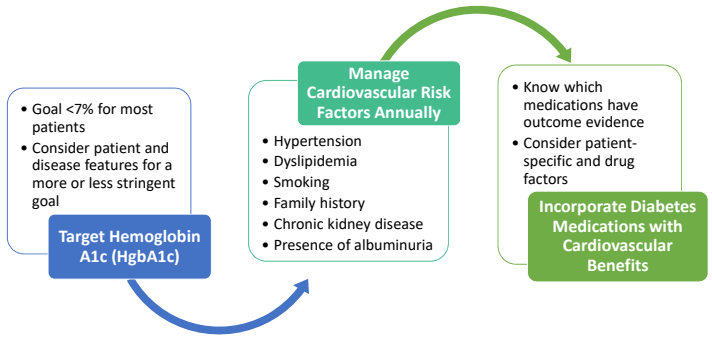
- Apply recent changes to blood pressure goals in patients with diabetes
- Assess the role of new antihyperglycemic therapies in preventing major adverse cardiovascular events
- Discuss the benefits, concerns, and barriers when incorporating new cardiovascular risk strategies in patients with diabetes

Cardiovascular Risk and Diseases in Diabetes

- Atherosclerotic cardiovascular disease (ASCVD) is the leading cause of morbidity and mortality in a patient with diabetes mellitus (DM)
- Largest contributor to direct and indirect costs
- Hypertension (HTN) and dyslipidemia are clear risk factors for ASCVD in patients with diabetes

American Diabetes Association. *Diabetes Care*. 2018;41(Suppl 1):S73-S85.

Making the Link in Clinical Practice



American Diabetes Association. *Diabetes Care*. 2018;41(Suppl1):S55-S64.
American Diabetes Association. *Diabetes Care*. 2018;41(Suppl1):S73-S85.

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Hypertension and Diabetes

- Approximately 80% of adult DM patients have HTN
- Co-existence of HTN and DM significantly increases risk of:
  - Coronary heart disease
  - Stroke
  - Heart failure
  - Peripheral arterial disease
  - Cardiovascular mortality
  - Nephropathy
  - Retinopathy
- Limited quality evidence regarding optimal blood pressure goal in DM
- Many changes over recent years based on new evidence

Whelton PK, Carey RM, et al. *J Am Coll Cardiol.* 2018; 71(19):e127-e248.

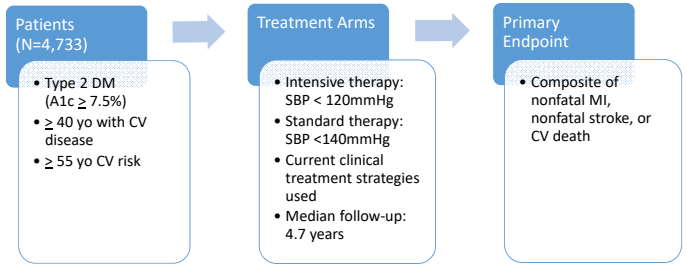
Guideline Comparison of Blood Pressure Goals

Guideline	General HTN (mmHg)	Diabetes (mmHg)
JNC7 (2003)	<140/90	<130/80
JNC8 (2014)	<140/90	<140/90
ADA (2014)	N/A	<140/80 (<130 if undue burden)
ADA (2015)	N/A	<140/90
ACC/AHA (2017)	<130/80	<130/80
ADA (2018)	N/A	<140/90 (<130 if high CV risk)

Chobanian AV, et al. *JAMA.* 2003; 289(19): 2560-71.
American Diabetes Association. *Diabetes Care.* 2014;37(Suppl. 1):S5-S13.
James PA, et al. *JAMA.* 2014; 311(5):507-520.
American Diabetes Association. *Diabetes Care.* 2015;38(Suppl. 1):S49-S57
Whelton PK, et al. *J Am Coll Cardiol.* 2018; 71(19):e127-e248.
American Diabetes Association. *Diabetes Care.* 2018;41(Suppl. 1):S86-S104.

ACCORD BP

- The Action to Control Cardiovascular Risk in Diabetes blood pressure trial



CV= cardiovascular; MI= myocardial infarction; SBP= systolic blood pressure

The ACCORD Study Group. *N Engl J Med.* 2010; 362:1575-85.

ACCORD BP Results

- Patients: 62.2 years, 47.7% women, 33.7% CV disease
  - Baseline BP: 139.2/76 mmHg
- SBP at 1 year:
  - Intensive (119.3 mmHg) vs Standard (133.5 mmHg)

Outcome	Intensive Therapy (N=2363) N(%/year)	Standard Therapy (N=2371) N(%/year)	Hazard Ratio (95% CI)	P Value
Primary*	208 (1.87)	237 (2.09)	0.88 (0.73-1.06)	0.20
Nonfatal MI	126 (1.13)	146 (1.28)	0.87(0.68-1.10)	0.25
Any Stroke	36 (0.32)	62 (0.53)	0.59 (0.39-0.89)	0.01
Nonfatal Stroke	34 (0.30)	55 (0.47)	0.63 (0.41-0.96)	0.03
CV Death	60 (0.52)	58 (0.49)	1.06 (0.74-1.52)	0.74

The ACCORD Study Group. *N Engl J Med*. 2010; 362:1575-85.

2018 ADA Recommendations

- At a minimum, treat to <140/90 mmHg to reduce CV and microvascular complications
- Lower goals (<130/80 or <120/80) may be beneficial if high CV risk
  - History of stroke
  - CV disease
  - Albuminuria
- Treatment goals should be individualized
- Pharmacologic treatment based on presence of albuminuria (>30mg/g)
  - Albuminuria: ACEi or ARB
  - Without albuminuria: ACEi, ARB, thiazide, calcium channel blocker
    - Proven reduction in CV events in DM patients

American Diabetes Association. *Diabetes Care*. 2018;41(Suppl. 1):S86-S104.

SPRINT

- A Randomized Trial of Intensive versus Standard Blood-Pressure Control

Patients (N=9361)
- SBP 130-180mmHg
- Increased CV risk
- **Key exclusions**:
  - DM
  - Prior stroke

Treatment Arms
- Intensive therapy: SBP < 120mmHg
- Standard therapy: SBP <140mmHg
- Current clinical treatment strategies used
- Median follow-up: 3.26 years

Primary Endpoint
- Composite of MI, ACS, stroke, heart failure, death from CV causes

ACS= acute coronary syndrome; CV= cardiovascular; MI= myocardial infarction; SBP= systolic blood pressure

The SPRINT Research Group. *N Engl J Med*. 2015;373:2103-2116.

SPRINT Results

- Patients: 67.9 years, ~35% women, 20% CV disease
  - Baseline BP: 139.7/78 mmHg
- SBP at 1 year:
  - Intensive (121.4 mmHg) vs Standard (136.2 mmHg)

Outcome	Intensive Therapy (N=4678) N(%/year)	Standard Therapy (N=4683) N(%/year)	Hazard Ratio (95% CI)	P Value
Primary*	243 (1.65)	319 (2.19)	0.75 (0.64-0.89)	<0.001
MI	97 (0.65)	116 (0.78)	0.83 (0.64-1.09)	0.19
ACS	40 (0.27)	40 (0.27)	1.00 (0.64-1.55)	0.99
Heart Failure	62 (0.41)	100 (0.67)	0.62 (0.45-0.84)	0.002
CV Death	37 (0.25)	65 (0.43)	0.57 (0.38-0.85)	0.005
All Cause Death	155 (1.03)	210 (1.40)	0.73 (0.60-0.90)	0.003

The SPRINT Research Group. *N Engl J Med*. 2015;373:2103-2116.

2017 ACC/AHA Recommendations

- Endorse lower BP goals based on SPRINT data
  - Known CVD or 10-year ASCVD risk ≥ 10%
    - <130/80mmHg
- Assumes vast majority of patients with DM have 10-year ASCVD risk of ≥ 10%
- Reinforce that ACCORD was underpowered due to lower than expected event rates
- SPRINT sub-study showed patients with prediabetes had similar benefit than those with normoglycemia

Whelton PK, et al. *J Am Coll Cardiol.* 2018; 71(19):e127-e248.

Summary

- Limited quality evidence available to determine optimal BP target in adults with DM
- Treatment goals should be individualized
- Goal <130/80 mmHg if high risk and tolerated

Patient Case: Meet SN

A 56-year-old male presents for a follow-up appointment in a pharmacist's diabetes clinic. Upon questioning, he reports taking his medications daily and has no side effects to report. He has a blood glucose log with him which reveals readings > 200 over the past couple of months. He denies symptoms of hypoglycemia.

Past Medical History	Current Medications	Social History	Family History
Type 2 diabetes mellitus Hypertension Hyperlipidemia Peripheral vascular disease	Lisinopril 5 mg PO daily Metformin 1000 mg PO BID Atorvastatin 20 mg PO daily	Former smoker Denies alcohol Denies illicit substances	Father: alive, history of heart disease Mother: died from stroke complications

Patient Case: Question #1

You assess SN's vitals which were taken at the beginning of his clinic appointment. His BP is 148/86, P 78, RR 14, and T 37.8 ^{o}C

According to the 2017 ACC and ADA guidelines, which of the following blood pressure goals is best to target in this patient?

A. < 120/80 mmHg
B. < 130/80 mmHg
C. < 140/90 mmHg
D. < 150/90 mmHg

Learning Objectives- Pharmacist

- Apply recent changes to blood pressure goals in patients with diabetes
- **Assess the role of new antihyperglycemic therapies in preventing major adverse cardiovascular events**
- Discuss the benefits, concerns, and barriers when incorporating new cardiovascular risk strategies in patients with diabetes

2008 FDA Guidance for Cardiovascular Risk

- New therapies must not result in an unacceptable increase in CV risk
- Inclusion of major CV events as endpoints in all phase 2 and 3 trials
  - Major CV events (**MACE**): death from CV causes, nonfatal myocardial infarction and nonfatal stroke
- Include high-risk patients for a meaningful estimate of CV risk
- Compare incidence of important CV events occurring with investigational agent versus control group

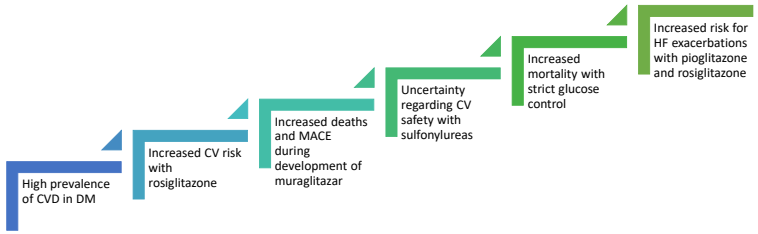
U.S. Food and Drug Administration. *Guidance for Industry. Diabetes Mellitus – Evaluating Cardiovascular Risk in New Antidiabetic Therapies to Treat Type 2 Diabetes.* December 2008. Available from https://www.fda.gov/downloads/Drugs/Guidances/ucm071627.pdf. Accessed 16 July 2018.

2008 FDA Guidance for CV Risk

Upper Bound of Two-Sided 95% Confidence Interval for Estimated CV Risk Ratio (investigational drug vs. control)	
> 1.8	**Decision:** Approval denied **Next Steps:** Additional, large safety trials should be conducted
1.3-1.8	**Decision:** Approval granted as overall risk-benefit analysis supports approval **Next Steps:** Postmarketing trial generally necessary to definitely show estimated risk ratio is < 1.3
< 1.3	**Decision:** Approval granted as overall risk-benefit analysis supports approval **Next Steps:** Postmarketing trial may not be necessary

U.S. Food and Drug Administration. *Guidance for Industry. Diabetes Mellitus – Evaluating Cardiovascular Risk in New Antidiabetic Therapies to Treat Type 2 Diabetes.* December 2008. Available from https://www.fda.gov/downloads/Drugs/Guidances/ucm071627.pdf. Accessed 16 July 2018.

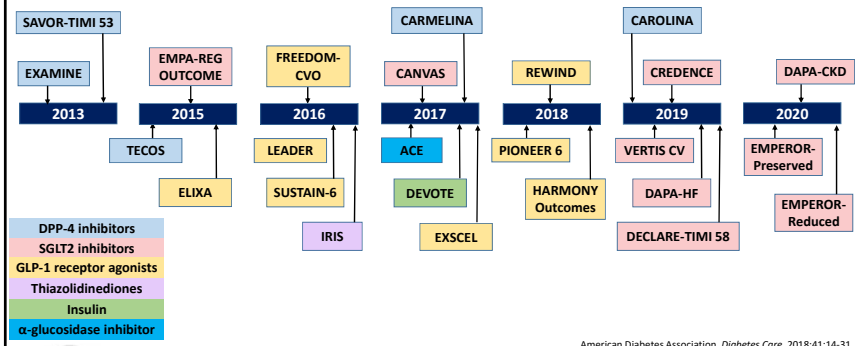
Why was the guidance created?



CVD= cardiovascular disease; HF= heart failure

Smith RJ et al. *Diabetes Care.* 2016;39:738-42.

Timeline of CV Outcome Trials in T2DM



American Diabetes Association. *Diabetes Care.* 2018;41:14-31.

DPP-4 Inhibitors: Summary of CV Risk Trials

Medication/Trial	Saxagliptin / SAVOR TIMI-53	Alogliptin / EXAMINE	Sitagliptin / TECOS
Control Arm	Placebo	Placebo	Placebo
Design DB= double-blind; PC= placebo-controlled	Randomized, DB, PC 788 sites, 26 countries 16,492 patients	Randomized, DB 898 sites, 49 countries 5380 patients	Randomized, DB, PC 673 sites, 38 countries 14,735 patients
Type 2 Diabetes Mellitus (T2DM) Population	HgbA1c 6.5-12% (mean, 8%) History of CVD (78%) **OR** multiple risk factors for CVD	HgbA1c 6.5-11% (mean, 8%) - If on insulin: 7-11% ACS within 15-90 days	Age 50+ HgbA1c 6.5-8% (mean, 7.2%) History of CVD
Primary Composite Endpoint & Results MACE= major adverse CV events [CV death, nonfatal myocardial infarction, nonfatal stroke]	MACE = not significant (NS)	MACE= NS	MACE **plus** hospitalization for UA - Per-protocol: SS - Intention-to-treat: NS
Secondary Composite Endpoint & Results UA= unstable angina	Primary composite **PLUS**, hospitalization for UA, HF, or coronary revascularization = NS	Primary composite **PLUS**, urgent revascularization due to UA = NS	MACE, per-protocol: SS MACE, intention-to-treat: NS
Other Notes	Hospitalization for HF ↑ (HR 1.27)	Non-significant trend in ↑ HF	None

DPP-4 inhibitors do not have a FDA approved indication to reduce CV mortality and events in patients with T2DM and ASCVD.

Scirica BM et al. *NEJM.* 2013;369:1317-26. White WB et al. *NEJM.* 2013;369:1327-35. Green JB et al. *NEJM.* 2015;373:232-42.

SGLT-2 Inhibitors: Summary of CV Risk Trials

Medication	Empagliflozin	Canagliflozin	Danagliflozin
Trial Name	**EMPA-REG**	**CANVAS**	**DECLARE TIMI-58**
Control Arm	Placebo	Placebo	Placebo
Design	Randomized, DB, PC 590 sites, 42 countries 7028 patients	Randomized, DB, Parallel, PC 667 sites, 30 countries 10,142 patients	Randomized, DB, PC 882 sites, 33 countries 17,160 patients
T2DM Population	HgbA1c ranges: - If no Rx: 7-9% - If stable Rx: 7-10% Established ASCVD BMI ≤ 45 kg/m² eGFR ≥ 30 ml/min/1.73m²	HgbA1c 7-10.5% Age ≥30 with established ASCVD ***OR*** Age ≥50 with ≥2 CVD risk factors eGFR ≥ 30 ml/min/1.73m²	HgbA1c 6.5 to <12% Age ≥ 40 with established ASCVD **OR** ≥2 CVD risk factors ***OR*** Male ≥55, Female ≥60 with 1 risk factor CrCl ≥ 60 mL/min
All trials had a primary composite endpoint of death from CV causes, nonfatal myocardial infarction, and nonfatal stroke			
Secondary Composite Endpoint	Primary composite **PLUS** hospitalization for UA	*Not applicable*	Primary composite **PLUS** CV death/hospitalization for HF
Duration	2.6 years	188.2 weeks (total study: 8 yrs)	Estimated Completion: 7/18/18

BMI= body mass index; CrCl= creatinine clearance; eGFR= estimated glomerular filtration rate

Zinman B et al. *NEJM.* 2015;373(22):2117-28.
Neal B et al. *NEJM.* 2017;377(7):644-57.
Wiviott SD et al. *American Heart Journal.* 2018;200:83-89.

SGLT-2 Inhibitors: Baseline Demographics

	Empagliflozin / EMPA-REG		Canagliflozin / CANVAS
Age (mean-yrs)	63.1		63.3
Duration of Diabetes	≤ 1 year >1-5 years 5-10 years >10 years	2.45% 15.55% 24.8% 57.2%	13.5 (median-yrs)
Baseline HgbA1c (mean)	8.08		8.2
Established ASCVD – %	99		56
Hypertension – %	NR		90
Prior HF – %	NR		14.4
Current smoker	NR		17.8
BMI – kg/m²	30.7		32
eGFR – ml/min/1.73m²	74		76.5

Zinman B et al. *NEJM.* 2015;373(22):2117-28.
Neal B et al. *NEJM.* 2017;377(7):644-57.

SGLT-2 Inhibitors: Results

	Empagliflozin / EMPA-REG		Canagliflozin / CANVAS	
	HR (95%CI)	P Value	HR (95%CI)	P Value
Primary Composite *= one-sided P value shown for noninferiority ^^= two-sided P value shown for superiority	0.86 (0.74-0.99)	<0.001* 0.04^^	0.86 (0.75-0.97)	<0.001* 0.02^^
Secondary Composite	0.89 (0.78-1.01)	<0.001* 0.08^^	*NA*	*NA*
Death from CV causes	0.62 (0.49-0.77)	<0.001	0.87 (0.72-1.06)	0.24
Nonfatal MI	0.87 (0.70-1.09)	0.23	0.85 (0.69-1.05)	--
Nonfatal stroke	1.24 (0.92-1.67)	0.16	0.90 (0.71-1.15)	--
Death from any cause	0.68 (0.57-0.82)	<0.001	0.87 (0.74-1.01)	0.24
Hospitalization for HF	0.65 (0.50-0.85)	0.002	0.67 (0.52-0.87)	--
Other Study Notes	↓ progression of renal disease (p < 0.001)		↑↑ risk of amputation (HR 1.97) ↑ fracture risk (HR 1.26) ↓ progression of renal disease (p < 0.001)	
FDA Approved Indication?	YES		NO	

Zinman B et al. *NEJM*. 2015;373(22):2117-28.
Neal B et al. *NEJM*. 2017;377(7):644-57.

GLP-1 Agonists: Summary of CV Risk Trials

Medication	Lixisenatide	Liraglutide	Semaglutide	Exenatide
Trial Name	**ELIXA**	**LEADER**	**SUSTAIN-6**	**EXSCEL**
Control Arm	Placebo	Placebo	Placebo	Placebo
Design	Randomized, DB, PC 49 countries 6068 patients	Randomized, DB, PC 410 sites, 32 countries 9340 patients	Randomized, DB, PC, PG 230 sites, 20 countries 3297 patients	Randomized, DB, PC 687 sites, 35 countries 14,752 patients
T2DM Population	ACS event within 180 days	HgbA1c ≥7% Age ≥50 + ≥1 CVD ***OR*** Age ≥60 + ≥1 CV risk factor	HgbA1c ≥7% Age ≥50 + ≥1 CVD ***OR*** Age ≥60 + ≥1 CV risk factor	HgbA1c 6.5-10% Any level of CV risk - 30% no CV events - 70% CV events
Primary Composite Endpoint	CV death, nonfatal MI, nonfatal stroke, UA	CV death, nonfatal MI, nonfatal stroke	CV death, nonfatal MI, nonfatal stroke	CV death, nonfatal MI, nonfatal stroke
Secondary Composite Endpoint(s)	1. Primary composite or hospitalization for HF 2. Above **PLUS** coronary revascularization	Primary composite **PLUS** coronary revascularization, hospitalization for UA or HF	Primary composite **PLUS** coronary revascularization, hospitalization for UA or HF	*Not applicable*
Duration	25 months	3.8 years	2.1 years	3.2 years

Pfeffer MA et al. *NEJM*. 2015;373(23):2247-57.
Marso SP et al. *NEJM*. 2016;375(4):311-22.
Marso SP et al. *NEJM*. 2016;375(19):1834-44.
Holman RR et al. *NEJM*. 2017;377(13):1228-39.

GLP-1 Agonists: Baseline Demographics

	Lixisenatide / ELIXA	Liraglutide / LEADER	Semaglutide/ SUSTAIN-6	Exenatide / EXSCEL
Age (mean-yrs)	60.3	64.3	64.6	62
Duration of Diabetes (median-yrs)	9.3	12.8	13.9	12
Baseline HgbA1c (mean)	7.6	8.7	8.7	8
Established ASCVD– %	--	81.4	72.1	73.1
Hypertension – %	76.4	--	92.8	--
Prior HF – %	22.4	17.8	23.6	16.2
Current smoker	11.7	--	NR	11.7
Qualifying ACS Event – %		Not applicable	Not applicable	Not applicable
NSTEMI	38.6			
STEMI	43.9			
Unstable angina	17.2			

NSTEMI= non-ST-elevation myocardial infarction;
STEMI= ST-elevation myocardial infarction

Pfeffer MA et al. *NEJM*. 2015;373(23):2247-57.
Marso SP et al. *NEJM*. 2016;375(4):311-22.
Marso SP et al. *NEJM*. 2016;375(19):1834-44.
Holman RR et al. *NEJM*. 2017;377(13):1228-39.

GLP-1 Agonists: Results

	Lixisenatide / ELIXA		Liraglutide / LEADER		Semaglutide / SUSTAIN-6		Exenatide / EXSCEL	
	HR (95%CI)	P Value	HR (95%CI)	P Value	HR (95%CI)	P Value	HR (95%CI)	P Value
Primary Composite *non-inferiority testing; ^^superiority testing	1.02 (0.89-1.17)	0.81	0.87 (0.78-0.97)	0.01	0.74 (0.58-0.95)	<0.001* 0.02^^	0.91 (0.83-1.00)	<0.001* 0.061^^
Secondary Composite(s)	0.97 (0.85-1.10) 1.00 (0.90-1.11)	0.63 0.96	0.88 (0.81-0.96)	0.005	0.74 (0.62-0.89)	0.002	--	--
Death from CV causes	0.98 (0.78-1.22)	0.85	0.78 (0.66-0.93)	0.007	0.98 (0.65-1.48)	0.92	0.88 (0.76-1.02)	0.628
Nonfatal MI	1.03 (0.87-1.22)	0.71	0.88 (0.75-1.03)	0.11	0.74 (0.51-1.08)	0.12	0.95 (0.84-1.09)	0.628
Nonfatal stroke	1.12 (0.79-1.58)	0.54	0.89 (0.72-1.11)	0.30	0.61 (0.38-0.99)	0.04	0.86 (0.70-1.07)	0.628
Death from any cause	0.94 (0.78-1.13)	0.50	0.85 (0.74-0.97)	0.02	1.05 (0.74-1.50)	0.79	0.86 (0.77-0.97)	--
Hospitalization for UA	--	--	0.98 (0.76-1.26)	0.87	0.82 (0.47-1.44)	0.49	--	--
Hospitalization for HF	0.96 (0.75-1.23)	0.75	0.87 (0.73-1.05)	0.14	1.11 (0.77-1.61)	0.57	0.94 (0.78-1.13)	
Hospitalization for coronary revascularization	--	--	0.91 (0.80-1.04)	0.18	0.65 (0.50-0.86)	0.003	--	--
Other Study Notes			↓ progression of renal disease (p 0.003)		↓ progression of renal disease (p 0.005)			
FDA Approved Indication?	NO		YES		NO		NO	

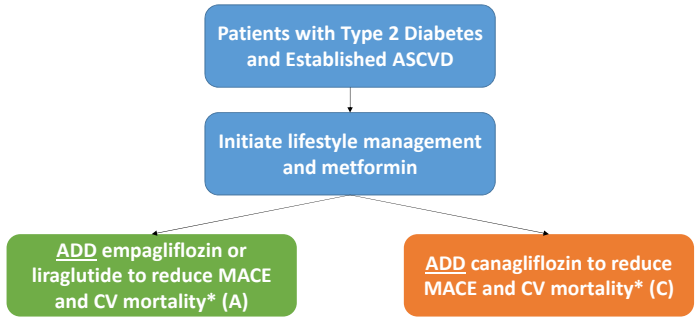
Pfeffer MA et al. *NEJM*. 2015;373(23):2247-57.
Marso SP et al. *NEJM*. 2016;375(4):311-22.
Marso SP et al. *NEJM*. 2016;375(19):1834-44.
Holman RR et al. *NEJM*. 2017;377(13):1228-39.

Study Critique and Future Considerations

Limitations	Considerations for Future Trials
• Lack of generalizability • Short timeline for assessing potential benefits and harm • Placebo-controlled design	• More diverse, lower-risk populations • Longer follow-up • Active comparators • Innovative designs • Standardized definitions for safety of microvascular outcomes • Modifications of end points and analyses • Establishment of biorepositories • Enhanced efficacy and cost-sharing options • Involvement of patients and advocacy organizations

American Diabetes Association. *Diabetes Care*. 2018;41:14-31.

2018 Standards of Care Recommendations



***= Consider patient and drug-specific factors in decision making**

American Diabetes Association. *Diabetes Care*. 2018;41(Suppl 1):S73-S85.

Patient Case: Question #2

SN's baseline hemoglobin A1c 6 months ago was 9.5%. He was initially started on metformin 500 mg PO BID, and titrated to 1000 mg PO BID approximately three months ago. He denies missing any doses. Today, his hemoglobin A1c is 7.8%. He would like to hold off on any injectable agents at this time if possible.

Taking into account his patient-specific factors, which of the following is best to initiate to achieve optimal glycemic control?

A. Canagliflozin
B. Empagliflozin
C. Liraglutide
D. Sitagliptin

Learning Objectives - Pharmacist

- Apply recent changes to blood pressure goals in patients with diabetes
- Assess the role of new antihyperglycemic therapies in preventing major adverse cardiovascular events
- **Discuss the benefits, concerns, and barriers when incorporating new cardiovascular risk strategies in patients with diabetes**

Barriers to Managing CV Risk

- Access
- Complexities in treatment
- Knowledge gaps
- Coordination of care
- Time

Survey looks at barriers, opportunities for managing CV risk in diabetes patients. *Cardiology.* August 2017: 23.

Access

- Cost
  - Large concern of both providers and patients
  - Many new medications are non-formulary or are typically on higher tiers for cost
    - Patients often have to decide if they pay their utility bill or their co-pay
  - Using coupon cards works for certain patients
- Prior authorizations
  - While some newer medications can be prescribed via prior authorizations, the process is time-intensive
  - The more difficult it is to get through, the less likely providers are to use it

Complexity of Treatment

- Patients have multiple co-morbidities and each disease state may require multiple treatments
- Difficult to implement lifestyle changes, e.g. diet modification, weight loss, and regular exercise
  - Conflicting information exists to patients regarding diet making it even more difficult to implement

Gaps in Knowledge

- Clinicians
  - Understanding of new data from recent clinical trials is a huge critical gap
    - If you don't know the data, then you don't practice it
    - Increasing provider understanding should increase "buy-in" on newer therapies
- Patients
  - Trained to use surrogate markers as a measure of how well they are doing
  - Example - LDL
    - Adding a statin medication to patients whose fasting lipid panel is within range presents challenges

Coordinated Care

- Coordinating care among providers (cardiology, endocrinology, primary care) presents challenges
- Physicians may be concerned about "stepping on toes"

Time

- It takes a good amount of time to spend with patients to discuss the pros/cons of newer therapies
- Many providers just are not given the opportunity to do so given the typical visit is 15-20 minutes to cover more than just diabetes care

Issues that may arise while discussing CV outcome with patients

- "My doctor said my cholesterol is fine. Why would I need a medication for cholesterol?"
- Adding a statin to patients whose fasting lipid panel is within range presents challenges
  - Explaining to patients the reasoning behind the addition
  - Helps that high-intensity statin therapy is available at a low cost

Patient Concerns with Medications

- "Aren't there other medications that are cheaper to control my diabetes?"
- Adding a GLP-1 agonist or SGLT-2 inhibitor with good CV data presents challenges
  - Explaining to patients the reasoning behind the addition, the pros/cons of each medication to treat diabetes
  - Discussing long-term benefits of taking a medication with good CV data

Adherence

- "I feel fine. Why do I need take my medication if my glucose is within goal range."
- Explaining the purpose of medications and why it's important to maintain adherence even if glucose levels are within range

Patient Case: Review

SN

- 56-year-old male
- BP 148/86, P 78, RR 14, T 37.8 ^{o}C
- Glucose log reveals readings > 200 over the past couple of months
- Hemoglobin A1c: 9.5% (6 months ago); 7.8% (today)

Past Medical History	Current Medications	Social History	Family History
Type 2 DM Hypertension Hyperlipidemia Peripheral vascular disease	Lisinopril 5 mg PO daily Metformin 1000 mg PO BID Atorvastatin 20 mg PO daily	Former smoker Denies alcohol Denies illicit substances	Father: alive, history of heart disease Mother: died from stroke complications

Patient Case: Question #3

In the case of SN, what barriers or challenges may arise when optimizing his cardiovascular risk profile?

Questions?