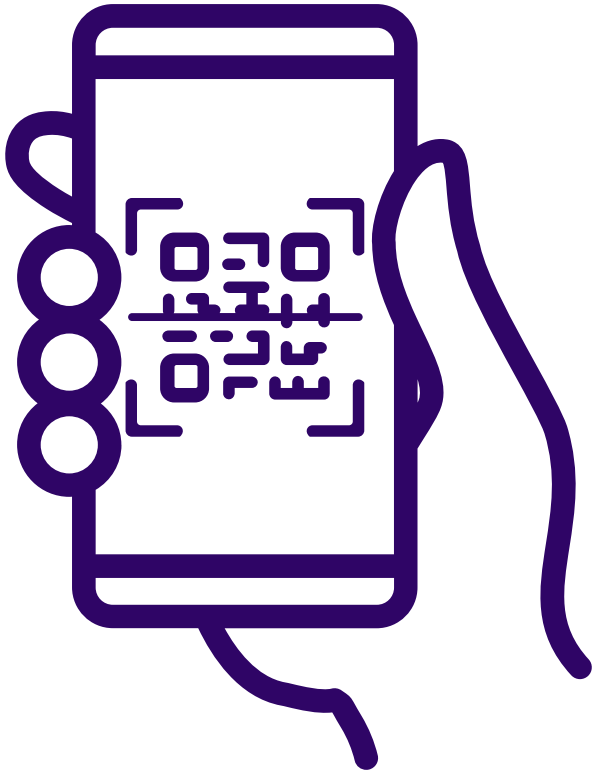
Shedding the light on cardiorenal complications of type 2 diabetes

Polling Questions



Please scan the QR code using your mobile device to answer the polling questions

Disclosure

Speaker's name and title	

Relationships With Financial Sponsors (last 2 years)

CONSULTING FEES/ ADVISORY BOARD MEMBER:	
SPEAKERS BUREAU/HONORARIA:	
GRANTS/RESEARCH SUPPORT:	
OTHER:	

Disclosure of financial support

This program has received

- Financial support from the Boehringer Ingelheim and Eli Lilly Alliance in the form of an educational grant.
- In-kind support from the Boehringer Ingelheim/Eli Lilly Canada Alliance in Diabetes in the form of logistical support.

Potential conflicts of interest

- Members of the scientific planning committee received honoraria from the CPD Network.
- Eli Lilly Canada Inc. and Boehringer Ingelheim Canada Ltd. benefit from the sale of products that may be discussed as part of this program, including:
    - Baqsimi® (nasal glucagon); Trulicity® (dulaglutide); Jardiance® (empagliflozin); Synjardy® and Synjardy® XR (empagliflozin/metformin and long acting); Glyxambi® (empagliflozin/linagliptin); Tradjenta® (linagliptin); Jentadueto® and Jentadueto® XR (linagliptin/metformin and long-acting); Glucagon; Lyumjev100™ (insulin lispro-aabc); Basaglar®100 (insulin glargine); Humalog®100, 200, Junior (insulin lispro); Humalog®50/50 mix, 75/25 mix (insulin lispro protamine/injectable suspension); Humulin®R 100, 500 (regular human insulin); Humulin® 70/30 (human insulin isophane suspension/human insulin);and Humulin®N (NPH human insulin isophane suspension).

Disclosure of financial support

Mitigation of potential biases

- The CPD Network, a not-for-profit physician organization, received an educational grant to develop this program. The CPD Network engaged the scientific planning committee and participated in the content development and formatting of this program.
- The steering committee was solely and fully responsible for developing all content and was involved at all stages of CME development to achieve scientific integrity, objectivity and balance.
- Boehringer Ingelheim / Eli Lilly provided funding for the content development and this CME event but were not involved in any aspect of the program development process.
- Speakers have received instructions on the Conflict of Interest disclosure requirements and are required to complete all necessary documents as mandated by the FMOQ. Should any conflict arise, it will be brought to the attention of the CPD Network and the subsequent course of action will be dependent on the nature of the conflict. Every effort will be made to mitigate any perceived conflicts as well.
- Speakers must inform the audience if unapproved or off-label uses of a product are discussed and if any discussions represent the personal opinions of the speakers. Unsolicited questions should be directed to the speakers.

Scientific planning committee

A type 2 diabetes training program developed for and by Quebec physicians!

CHAIR

Christian Constance
MD, FRCPC
Assistant clinical professor,
Université de Montréal
Cardiologist, Head of the Coronary and Hemodynamics Unit
Hôpital Maisonneuve-Rosemont
Montréal (Quebec)

COMMITTEE MEMBERS

Bruno Bernucci
BSc, MD, CCFP
Family physician
Polyclinique Levasseur
Montréal (Quebec)

Stavroula Christopoulos
MD, FRCPC
Endocrinologist, Hôpital général juif
Assistant clinical professor,
McGill University
Montréal (Quebec)

Louise Frenette
MD
FMOQ representative and consulting physician
Direction de la santé publique de l'Estrie
Sherbrooke (Quebec)

Jeffrey Habert
MD, CCFP, FCFP
Assistant professor, Department of Family and Community Medicine
University of Toronto
Toronto (Ontario)

Normand Proulx
BSc, MD, FRCPC
Consultant and Head of Nephrology Department
Nephrologist, CISSS de l'Outaouais
Lecturer, McGill University
Montréal (Quebec)

Certification

Fédération des médecins omnipraticiens du Québec

The Fédération des médecins omnipraticiens du Québec, an organization fully accredited in continuing education by the Collège des Médecins du Québec, recognizes 1 to 3 hours of professional development activity meeting the requirements of the Règlement sur la formation continue obligatoire des médecins of the CMQ. The Code of Ethics of the Conseil québécois de dévelopment professionnel continu des médecins (CQDPCM) must be respected (www.cqdpcm.ca).

Learning objectives

Upon completion of this program, participants will be able to:

Compare and contrast clinical presentations and pathologies related to metabolic, cardiovascular and renal diseases

Develop personalized treatment plans based on different metabolic or cardiorenal factors

Recommend strategies and resources to improve the management of complex clinical cases

Brand names of drugs that may be discussed under this program

Class	Proper name (brand name)
Alpha-glucosidase inhibitors	Acarbose **(Glucobay™)**
Biguanides	Metformin (**Glucophage®**)
DPP-4 inhibitors	Alogliptin (**Nesina®**) Linagliptin (**Trajenta®**) Saxagliptin (**Onglyza®**) Sitagliptin (**Januvia®**)
GLP-1 receptor agonists (short-acting)	Liraglutide (**Victoza®**) Lixisenatide (**Adlyxine™**) Semaglutide (**Rybelsus®**)
GLP-1 receptor agonists (long-acting)	Dulaglutide (**Trulicity®**) Semaglutide (**Ozempic®**)
Insulin secretagogues	Gliclazide (**Diamicron®**) Glimepiride (**Amaryl®**) Glyburide (**Diabeta®**) Repaglinide (**Gluconorm®**)

Class	Proper name (brand name)
SGLT2 inhibitors	Canagliflozin (**Invokana®**) Dapagliflozin (**Forxiga®**) Empagliflozin (**Jardiance®**)
Selective non-steroidal mineralcorticoid receptor antagonist	Finerenone (**Kerendia®**)
Thiazolidinediones	Pioglitazone (**Actos®**) Rosiglitazone (**Avandia®**)
Pancreatic lipase inhibitor	Orlistat (**Xenical®**)
Opioid antagonist and aminoketone antidepressant	Naltrexone/bupropion (**Contrave®**)
Angiotensin receptor/neprilysin inhibitor	Sacubitril/valsartan (**Entresto®**)

8 mystery patients








8 mystery patients

01 With obesity

02 With CVD and controlled A1C

03 Experiencing fatigue and shortness of breath on exertion

04 With chronic kidney disease (eGFR < 45)

8 different profiles... all diabetic

05 With heart failure

06 With CV risk factors and A1C > target

07 Independent patient, aged 80 or older, with multiple comorbidities

08 Newly diagnosed with T2D

A1C: glycosylated hemoglobin; CV: cardiovascular; CVD: CV disease; eGFR: estimated glomerular filtration rate; T2D: type 2 diabetes.

Choose a mystery patient...

Click on
a patient

Ms. R

Mr. D

Ms. O

Mr. A

Mr. E

Ms. I

Mr. F

Ms. C

Conclude the program

Who is the mystery patient?

Click ? to reveal a parameter and explain your reasoning

Sex and age	Female, 50 years old ?	
T2D	T2D for 5 years ?	
Relevant history	▪ Hypertension (controlled) ▪ Dyslipidemia (controlled) ? ▪ Non-smoker	
Recent exams	**BP**	128/80 mmHg
	BMI	30 kg/m²
	A1C	6.9% ?
	eGFR	43 mL/min/1.73 m²
	uACR	25 mg/mmol

Medications

Metformin 1000 mg BID
Glyclazide 160 mg BID
Sitagliptin 50 mg DIE ?
Perindopril 4 mg DIE
Simvastatin 20 mg DIE

Other relevant information

No additional information ?

- With obesity
- With CVD and controlled A1C
- Experiencing fatigue and shortness of breath on exertion
- With chronic kidney disease (eGFR < 45)
- With heart failure
- With CV risk factors and A1C > target values
- Independent patient, aged 80 or older, with multiple comorbidities
- Newly diagnosed with T2D

A1C: glycosylated hemoglobin; BID: twice daily; BMI: body mass index; BP: blood pressure; CV: cardiovascular; DIE: once daily; eGFR: estimated glomerular filtration rate; T2D: type 2 diabetes; uACR: urine albumin-to-creatinine ratio.

Masked question

Treatment with an SGLT2i should always be stopped as soon as the patient's eGFR falls below 30 mL/min/1.73 m^2.

True

False

eGFR: estimated glomerular filtration rate; SGLT2 inhibitor:sodium-glucose cotransporter 2 inhibitor

Discussion of the case study

Next slide

Ms. Radhika

Female, 50 years old

With chronic kidney disease
eGFR 43 mL/min/1.73 m^2
uACR 25 mg/mmol

- Metformin, 1000 mg BID
- Glyclazide, 160 mg BID
- Sitagliptin, 50 mg DIE
- Perindopril, 4 mg DIE
- Simvastatine, 20 mg DIE

1. What do you think of the patient's eGFR (43 mL/min/1.73m^2) and uACR (25 mg/mmol)? What therapeutic changes would you make based on these parameters?
2. How often do you perform kidney function testing (eGFR and uACR)? How would you rate her risk of developing kidney disease? When would you consider referral to a nephrologist?
3. Do her kidney function results preclude the use of an agent for cardiorenal protection?
4. And if the patient's eGFR were to drop to 28 mL/min, what would you do with an SGLT2i, if anything?
5. Could we maintain a GLP-1 RA if the eGFR drops to 25 mL/min?
6. What is the evidence to support the use of an SGLT2i in this patient? Finerenone? What if the patient were non-albuminuric?
7. What if the patient had CKD, but not T2D, would you still use an SGLT2i?

CKD definition | KDIGO | DC 2020 | Kidney function | SGLT2i evidence | Finerenone evidence

BID: twice daily; CKD: chronic kidney disease; DC: Diabetes Canada; eGFR: glomerular filtration rate; GLP-1 RA: glucagon-like peptide-1 receptor agonist; SGLT2 inhibitor: sodium-glucose cotransporter 2 inhibitor; uACR: urine albumin-to-creatinine ratio

Under the mask

Treatment with an SGLT2i should always be stopped as soon as the patient's eGFR falls below 30 mL/min/1.73 m^2

True

False

eGFR: estimated glomerular filtration rate; SGLT2 inhibitor:sodium-glucose cotransporter 2 inhibitor

Key points of the case study

Check eGFR and uACR once a year, or more often in case of abnormalities.

An SGLT2i is indicated for patients who have T2D and CKD.

As kidney function declines, SGLT2i continue to confer cardiorenal protection, but they are less effective at reducing A1C.

If A1C needs to be reduced further, one or more antihyperglycemic agents should be added—a GLP-1 RA is a recommended choice.

Refer the patient to a nephrologist in case of 1) rapid loss of kidney function; 2) persistent uACR > 60 mg/mmol or progressive increase in uACR despite treatment; 3) eGFR < 30 mL/min; and 4) adverse events precluding the continuation of renoprotective therapies.

A1C: glycosylated hemoglobin; CKD: chronic kidney disease; eGFR: estimated glomerular filtration rate; GLP-1 RA: glucagon-like peptide-1 receptor agonist; SGLT2i: sodium-glucose cotransporter 2 inhibitor; T2D: type 2 diabetes; uACR: urine albumin-to-creatinine ratio

Mystery patients menu

Who is the mystery patient?

Click ? to reveal a parameter and explain your reasoning

Sex and age	Male, 48 years old ?	
T2D	Newly diagnosed ?	
Relevant history	Smoker Family history of T2D (both parents) ? Dyslipidemia	
Recent exams	**BP**	143/96 mmHg
	BMI	26 kg/m²
	A1C	8.4% ?
	eGFR	72 mL/min/1.73 m²
	uACR	0.6 mg/mmol

Medications

Rosuvastatin 10 mg ?

Other relevant information

LDL-C: 2.2 mmol/L ?

- With obesity
- With CVD and controlled A1C
- Experiencing fatigue and shortness of breath on exertion
- With chronic kidney disease (eGFR < 45)
- With heart failure
- With CV risk factors and A1C > target values
- Independent patient, aged 80 or older, with multiple comorbidities
- Newly diagnosed with T2D

A1C: glycosylated hemoglobin; BID: twice daily; BMI: body mass index; BP: blood pressure; CV: cardiovascular; DIE: once daily; eGFR: estimated glomerular filtration rate; LDL-C: low-density lipoprotein cholesterol; T2D: type 2 diabetes; uACR: urine albumin-to-creatinine ratio

Masked question

Regarding the management of T2D in a newly diagnosed patient, which of the following statements is true?

a) **Metformin is the preferred first-line option** because it results in the best glycemic control out of all the other options

b) **Metformin is no longer the preferred first-line option** according to Diabetes Canada guidelines

c) If A1C is **> 1.5%** above target, metformin should be started **in combination with a second agent**

d) If the target A1C level **is not achieved within 12 months**, pharmacological treatment should be considered

A1C: glycosylated hemoglobin; T2D: type 2 diabetes.

Discussion of the case study

Next slide

Mr. D'Amour

Male, 48 years old

Newly diagnosed
A1C of 8.4%
BP 143/96 mmHg

- Rosuvastatin 10 mg

1. What changes would you make to optimize the patient's treatment regimen (both from a glycemic perspective and in terms of lipids and BP)?
2. Should antihyperglycemic pharmacotherapy be started at the time of diagnosis?
3. What would your target A1C level be for this patient (< 6%, < 6.5%, or < 7.0%)?
4. Why is metformin still recommended as a first-line pharmacologic treatment? If the introduction of a second agent is indicated, what would you choose?
5. Can an antihyperglycemic drug with cardiorenal benefits be started when T2D is diagnosed instead of metformin?

ABCDESSS | A1C targets 2022 | DC 2020 new diagnosis | DC 2020 treatment | Hypertension

A1C: glycosylated hemoglobin; BP: blood pressure; DC: Diabetes Canada; T2D: type 2 diabetes;

Under the mask

Regarding the management of T2D in a newly diagnosed patient, which of the following statements is true?

a) **Metformin is the preferred first-line option** because it results in the best glycemic control out of all the other options

b) **Metformin is no longer the preferred first-line option** according to Diabetes Canada guidelines

c) If A1C is **> 1.5%** above target, metformin should be started **in combination with a second agent**

d) If the target A1C level **is not achieved within 12 months**, pharmacological treatment should be considered

A1C: glycosylated hemoglobin; T2D: type 2 diabetes

Key points of the case study

Optimal glycemic control in the early months after diabetes diagnosis is important to reduce the incidence and progression of vascular complications.

Assess whether the A1C target level has been achieved within 3 months.

Introduce metformin and a second agent if the A1C level is > 1.5% above target.

A1C: glycosylated hemoglobin

Mystery patients menu

Who is the mystery patient?

Click ? to reveal a parameter and explain your reasoning

Sex and age	Female, 45 years old ?	
T2D	T2D for 5 years ?	
Relevant history	▪ Non-smoker ▪ Polycystic ovary syndrome ▪ Hypertension ▪ Initial treatment with metformin and glyburide ? ▪ Episodes of hypoglycemia leading to discontinuation of glyburide	
Recent exams	**BP**	124/78 mmHg
	BMI	33 kg/m²
	A1C	7.4% ?
	eGFR	80 mL/min/1.73 m²
	uACR	0.5 mg/mmol

Medications

Metformin 500 mg BID
Rosuvastatine 20 mg DIE ?

Other relevant information

- South Asian origin
- Difficulty controlling weight for most of life
- Slow weight gain over several years, especially around the waist ?
- Tries to walk 15-20 minutes a day
- Dietary monitoring WITHOUT weight loss
- Difficulty maintaining good eating habits long term

- With obesity
- With CVD and controlled A1C
- Experiencing fatigue and shortness of breath on exertion
- With chronic kidney disease (eGFR < 45)
- With heart failure
- With CV risk factors and A1C > target values
- Independent patient aged 80 or older, with multiple comorbidities
- Newly diagnosed with T2D

A1C: glycosylated hemoglobin; BID: twice daily; BMI: body mass index; CV: cardiovascular; DIE: once daily; eGFR: estimated glomerular filtration rate; T2D: type 2 diabetes; uACR: urine albumin-to-creatinine ratio; BP: blood pressure

Masked question

Which of these antihyperglycemic agents provide glycemic control, cardiorenal protection, and weight loss?

Select the best answer.

a) GLP-1 RA

b) SGLT2i

c) GLP-1 RA and SGLT2i

d) DPP-4i, GLP-1 RA and TZD

e) DPP-4i and GLP-1 RA

f) DPP-4i and SGLT2i

DPP-4i: dipeptidyl peptidase-4 inhibitor; GLP-1 RA: glucagon-like peptide-1 receptor agonist; SGLT2i: sodium-glucose cotransporter 2 inhibitor; TZD: thiazolidinedione

Discussion of the case study

Ms. Oh

Female, 45 years old

With obesity
BMI of 33 kg/m²

- Metformin, 500 mg BID
- Rosuvastatin, 20 mg DIE

1. What changes would you make to optimize the patient's treatment regimen? Would you choose a GLP-1 RA or naltrexone/bupropione for the management of obesity?
2. How do you approach the issue of weight with your patients?
3. Would you consider bariatric surgery?
4. How familiar are you with the concept of adiposopathy (also known as "sick fat") as a contributing factor to T2D and its complications?
5. Should we broaden our thinking and incorporate the management of adiposopathy into our treatment goals?

BID: twice daily; BMI: body mass index; DC: Diabetes Canada; DIE: once daily; T2D: type 2 diabetes

Next slide

DC 2020 treatment | Obesity Canada | South Asian risk | Origins of T2D | T2D continuum | Waist circumference | Summary of effects

Under the mask

Which of these antihyperglycemic agents provide glycemic control, cardiorenal protection, and weight loss?

Select the best answer.

a) GLP-1 RA

b) SGLT2i

c) GLP-1 RA and SGLT2i

d) DPP-4i, GLP-1 RA and TZD

e) DPP-4i and GLP-1 RA

f) DPP-4i and SGLT2i

DPP-4i: dipeptidyl peptidase-4 inhibitor; GLP-1 RA: glucagon-like peptide-1 receptor agonist; SGLT2i: sodium-glucose cotransporter 2 inhibitor; TZD: thiazolidinedione

Key points of the case study

T2D and obesity are two distinct chronic diseases that often overlap.

In a patient whose primary goal is weight loss, the addition or replacement of antihyperglycemic agents may play an important role:

- Beneficial: GLP-1 RA, SGLT2 inhibitor
- Harmful: insulin, sulfonylurea

Bariatric surgery may be an option for patients who need to lose a lot of weight.

The patient or health care professional may have a weight bias: adopting a "code of conduct" when discussing weight with patients is a key component of weight management.

GLP-1 RA: glucagon-like peptide-1 receptor agonist; SGLT2 inhibitor: sodium-glucose cotransporter 2 inhibitor; T2D: type 2 diabetes

Mystery patients menu

Who is the mystery patient?

Click ? to reveal a parameter and explain your reasoning

Sex and age	Male, 84 years old ?	
T2D	T2D for 22 years ?	
Relevant history	Hypertension Coronary artery bypass surgery 20 years ago Atrial fibrillation Non-smoker ?	
Recent exams	**BP**	110/72 mmHg
	BMI	24 kg/m²
	A1C	7.5% ?
	eGFR	55 mL/min/1.73 m²
	uACR	5 mg/mmol

Medications

Metformin 1000 mg BID
Gliclazide 30 mg DIE
Glargine U-100 at 48 units HS
Quinapril 20 mg DIE
Amlodipine 10 mg DIE ?
Bisoprolol 2.5 mg DIE
HCTZ 12.5 mg DIE
Apixaban 5 mg BID
Atorvastatin 40 mg DIE

Other relevant information

Independent, but ability to self-manage is deteriorating ?

- With obesity
- With CVD and controlled A1C
- Experiencing fatigue and shortness of breath on exertion
- With chronic kidney disease (eGFR < 45)
- With heart failure
- With CV risk factors and A1C > target values
- Independent patient, aged 80 or older, with multiple comorbidities
- Newly diagnosed with T2D

BID: twice daily; CV: cardiovascular; DIE: once daily; T2D: type 2 diabetes; eGFR: glomerular filtration rate; A1C: glycosylated hemoglobin; HCTZ: hydrochlorothiazide; BMI: body mass index; uACR: urine albumin-to-creatinine ratio; BP: blood pressure

Masked question

Regarding Diabetes Canada's recommended glycemic targets for older people with diabetes, which of the following statements is true?

a) In a functionally dependent patient at low risk for hypoglycemia, the **target A1C is < 8.5%**

b) In an independent patient at higher risk for hypoglycemia, the **target A1C is < 8.0%**

c) In an autonomous patient at higher risk for hypoglycemia, the **target A1C level is ≤ 7.0%**

d) In a patient who is frail/has dementia and a higher risk of hypoglycemia, **the target A1C is < 9.0%**

BID: twice daily; DIE: once daily; GLP-1 RA: glucagon-like peptide-1 receptor agonist; SGLT-2 inhibitor: sodium-glucose cotransporter 2 inhibitor

Discussion of the case study

Next slide

Mr. Arcand

Male, 84 years old

Independent elderly patient with multiple comorbidities

- Metformin 1000 mg BID
- Gliclazide 30 mg DIE
- Glargine U-100 48 units HS
- Quinapril 20 mg DIE
- Amlodipine 10 mg DIE
- Bisoprolol 2.5 mg DIE
- HCTZ 12.5 mg DIE
- Apixaban 5 mg BID
- Atorvastatin 40 mg DIE

1. In an independent elderly patient, aged 80 or older, with multiple comorbidities, what is your typical target A1C level?
2. What change would you recommend to the patient's **antihyperglycemic** regimen?
3. What change would you recommend to the patient's **antihypertensive** regimen?
4. Weigh the risks of treatment with an SGLT2i and the benefits of this treatment on renal and cardiac parameters. For which patient would you choose an SGLT2i and in what circumstances should treatment be stopped?

Glycemic targets | Frailty scale | Considerations | Checklist | SGLT2i older people

BID: twice daily; DIE: once daily; A1C; glycosylated hemoglobin; SGLT2 inhibitor: sodium-glucose cotransporter 2 inhibitor

Under the mask

In the majority of independent elderly patients, regardless of the risk of hypoglycemia, the target A1C value is ≤ 7.0%[1]

Regarding Diabetes Canada's recommended glycemic targets for older people with diabetes, which of the following statements is true?

a) In a functionally dependent patient at low risk for hypoglycemia, the **target A1C is < 8.5%**

b) In an independent patient at higher risk for hypoglycemia, the **target A1C is < 8.0%**

c) In an autonomous patient at higher risk for hypoglycemia, the **target A1C level is ≤ 7.0%**

d) In a patient who is frail/has dementia and a higher risk of hypoglycemia, the **target A1C is < 9.0%**

BID: twice daily; DIE: once daily; GLP-1 RA: glucagon-like peptide-1 receptor agonist; SGLT-2 inhibitor: sodium-glucose cotransporter 2 inhibitor

1. Meneilly GS, et al. Can J Diabetes 2018;42(Suppl 1):S283-S295.

Key points of the case study

Everyone is different and older people with diabetes need to have a personalized diabetes treatment plan.

Treatment plans should take into account age and functional dependence and set realistic goals.

In those who have multiple comorbidities and frailty, strategies should focus on preventing hypoglycemia and achieving a less ambitious A1C target.

In frail elderly patients, adverse effects may be reason enough to interrupt a treatment, stop it completely, or replace it with another agent.

A1C: glycosylated hemoglobin

Mystery patients menu

Who is the mystery patient?

Click ? to reveal a parameter and explain your reasoning

Sex and age	Male, 74 years old ?	
T2D	T2D for 15 years ?	
Relevant history	▪ Hypertension ▪ Sedentary ▪ Smoker ▪ Mild intermittent asthma ?	
Recent exams	**BP**	135/86 mmHg
	BMI	26.5 kg/m²
	A1C	6.5% ?
	eGFR	61 mL/min/1.73 m²
	uACR	2.6 mg/mmol

Medications

Metformin 1000 mg BID
Semaglutide SC 0.5 mg per week
Ramipril 10 mg DIE ?
Atorvastatin 40 mg DIE

Other relevant information

- Complains of shortness of breath when climbing stairs and fatigue on exertion
- No symptoms of angina, cough, or fever

?

Other examinations:
- Pedal edema 1+
- Jugular vein distension
- Pulmonary: no crackles

- With obesity
- With CVD and controlled A1C
- Experiencing fatigue and shortness of breath on exertion
- With chronic kidney disease (eGFR < 45)
- With heart failure
- With CV risk factors and A1C > target values
- Independent patient, aged 80 or older, with multiple comorbidities
- Newly diagnosed with T2D

A1C: glycosylated hemoglobin; BID: twice daily; BMI: body mass index; BP: blood pressure; CV: cardiovascular; DIE: once daily; eGFR: estimated glomerular filtration rate; SC: subcutaneous; T2D: type 2 diabetes; uACR: urine albumin-to-creatinine ratio.

Masked question

According to the CCS heart failure guidelines, what should you do first for a patient with suspected heart failure with preserved ejection fraction (HFpEF)?

a) Assess their medical **history** and perform a physical **examination**

b) Assess their **natriuretic** peptide level

c) Assess cardiac structure and function by **echocardiography**

d) Refer the patient to a **pulmonologist** to investigate possible pulmonary etiologies

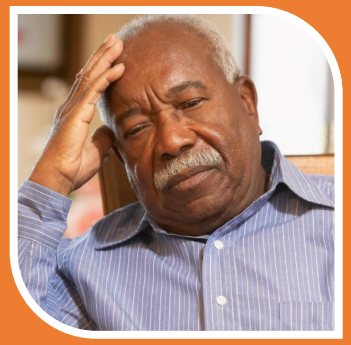
e) Refer the patient to a **cardiologist** for a diagnostic coronary angiography.

CCS: Canadian Cardiovascular Society

Discussion of the case study

Next slide

Mr. Eddy



Male, 74 years old

Experiencing shortness of breath and fatigue on exertion

Mr. Eddy's diagnostic work-up

1. Is it possible to overlook a HFpEF diagnosis in a patient?
2. Does HFpEF simply become HFrEF?
3. What should you look for first in a patient with suspected HFpEF? If the patient only presents with shortness of breath, is that enough to consider a diagnostic work-up?
4. What is/are the key test(s) for diagnosing HFpEF?
5. What changes would you make to optimize the patient's treatment regimen?

BID: twice daily; DIE: once daily; HFpEF: heart failure with preserved ejection fraction; HFrEF: heart failure with reduced ejection fraction; SC: subcutaneous

Under the mask

According to the CCS heart failure guidelines, what should you do first for a patient with suspected heart failure with preserved ejection fraction (HFpEF)?

a) Assess their clinical **history** and perform a physical **examination**

b) Evaluate their **natriuretic** peptide level

c) Evaluate cardiac structure and function by **echocardiography**

d) Refer the patient to a **respirologist** to investigate possible pulmonary etiologies

e) Refer the patient to a **cardiologist** for a diagnostic coronary angiography.

CCS: Canadian Cardiovascular Society

Key points from the case study:
A roadmap for identifying HFpEF in patients[1-5]

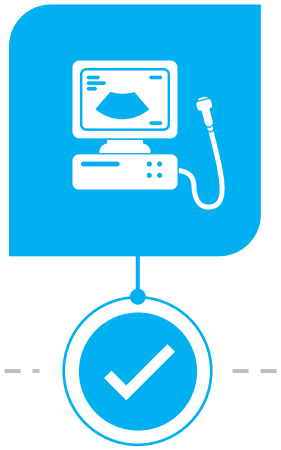
Signs and symptoms

Assess signs (see CCS algorithm on HF) and symptoms (NYHA class II-IV) of HFpEF.

Initial work-up

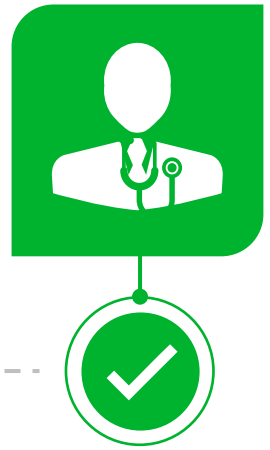
Rule out red flags with initial workup (e.g., sleep apnea, COPD, kidney disease, anemia)

Diagnostic work-up



Confirm diagnosis with abnormal NPs (with and without AF)
OR
structural indicators by echocardiography (>40% EF + LVH or LAE)

Management



1. Initiate evidence-based therapy (i.e., SGLT2 inhibitor)
2. Optimize medical therapy (see CCS HFpEF recommendations)
3. Address modifiable risk factors

AF: atrial fibrillation; CCS: Canadian Cardiovascular Society; COPD: chronic obstructive pulmonary disease; EF: ejection fraction; HF: heart failure; HFpEF: heart failure with preserved ejection fraction; LAH: left atrial hypertrophy; LVH: left ventricular hypertrophy; NT-proBNP: N-terminal pro-B-type natriuretic peptide.

1. Ezekowitz JA, et al. *Can J Cardiol*. 2017;33(11):1342-433; 2. McDonagh TA, et al. *Eur Heart J*. 2021;42(36):3599–726; 3. Heidenreich PA, et al. *J Am Coll Cardiol*. 2022; 79(17):e263-e421; 4. Anker S, et al. *N Engl J Med*. 2021;385(16):1451–61; 5. Solomon SD, *et al. N Engl J Med*. 2022;387(12):1089–98.

Mystery patients menu

Who is the mystery patient?

Click ? to reveal a parameter and explain your reasoning

Sex and age	Female, 73 years old ?	
T2D	T2D for 20 years ?	
Relevant history	Previous acute MI 15 years ago Angioplasty following MI ? Sedentary Hypertension	
Recent exams	**BP**	122/78mmHg
	BMI	28 kg/m²
	A1C	7.2% ?
	eGFR	62 mL/min/1.73 m²
	uACR	1.0 mg/mmol

Medications

Metformin 1000 mg BID
Perindopril 4 mg DIE
Bisoprolol 5 mg DIE
Spironolactone 25 mg DIE ?
Furosemide 40 mg DIE
Atorvastatin 40 mg DIE
Acetylsalicylic acid 81 mg DIE

Other relevant information

K+ of 4.9 mmol/L
LVEF of 35%
NYHA class II HF ?

- With obesity
- With CVD and controlled A1C
- Experiencing fatigue and shortness of breath on exertion
- With chronic kidney disease (eGFR < 45)
- With heart failure
- With CV risk factors and A1C > target values
- Independent patient, aged 80 or older, with multiple comorbidities
- Newly diagnosed with T2D

A1C : glycosylated hemoglobin; BID : twice daily; BMI: body mass index; BP: blood pressure; CV : cardiovascular; DIE : once daily; eGFR: estimated glomerular filtration rate; IC : heart failure; K+: potassium level; LVEF: left ventricular ejection fraction; MI: myocardial infarction; NYHA: New York Heart Association; T2D : type 2 diabetes; uACR: urine albumin/creatinine ratio.

Masked question

In the heart failure trials of patients with reduced ejection fraction, the rate of severe hypoglycemia with SGLT-2 inhibitor treatment was ____.

a) 10.7%

b) 5.1%

c) 3.2%

d) 1.8%

e) 0%

SGLT2i: sodium-glucose cotransporter 2 inhibitor

Discussion of the case study

Next slide

Ms. Isaac

Female, 73 years old

With HFrEF
With an EF of 35%

- Metformin 1000 mg BID
- Perindopril 4 mg DIE
- Bisoprolol 5 mg DIE
- Spironolactone 25 mg DIE
- Furosemide 40 mg DIE
- Atorvastatin 40 mg DIE
- Acetylsalicylic acid 81 mg DIE

1. What changes would you make to optimize the patient's treatment regimen?
2. How would you approach the initiation of an ARNi and an SGLT2i? (i.e., would you start both at the same time, or one of them first?)
3. What do you do if the volume status of the patient changes?
4. Should you be concerned about hypotension following initiation of an SGLT2i in a patient with HFrEF?
5. What if the patient did not have T2D (but had HFrEF) and was taking an ACEi, a BB, and an MRA?

DC 2020 | CCS 2021 | SGLT2i evidence | ARNi evidence | Volume status

ACEi: angiotensin-converting enzyme inhibitor; ARNi: angiotensin receptor-neprilysin inhibitor; BB: beta-blocker; BID: twice daily; CCS: Canadian Cardiovascular Society DC: Diabetes Canada; DIE: once daily; ; EF: ejection fraction; HFrEF: heart failure with reduced ejection fraction; MRA: mineralocorticoid receptor antagonist; SGLT2 inhibitor: sodium-glucose cotransporter 2 inhibitor; T2D: type 2 diabetes.

Under the mask

In the heart failure trials of patients with reduced ejection fraction, the rate of severe hypoglycemia with SGLT-2 inhibitor treatment was ____.

a) 10.7%

b) 5.1%

c) 3.2%

d) 1.8%

e) 0%

SGLT2i: sodium-glucose cotransporter 2 inhibitor

Key points of the case study

- Patients with HFrEF should receive four standard medications indicated for the treatment of HFrEF(ARNi, BB, MRA, SGLT2i), regardless of diabetic status.
- The recommendations do not establish a specific treatment sequence; decisions can be made on a case-by-case basis, depending on physiological tolerance to the various therapies.
- It is recommended that the four treatments be initiated within the first few weeks of a HFrEF diagnosis and then continued with dosage adjustments based on physiological tolerance.

ARNi: angiotensin receptor-neprilysin inhibitor; BB: beta-blocker; HFrEF: heart failure with reduced ejection fraction; MRA: mineralocorticoid receptor antagonist; SGLT2i: sodium-glucose cotransporter 2 inhibitor; T2D: type 2 diabetes.

Mystery patients menu

Who is the mystery patient?

Click ? to reveal a parameter and explain your reasoning

Sex and age	Male, 61 years old ?	
T2D	T2D for 10 years ?	
Relevant history	▪ Non-smoker ▪ Dyslipidemia ▪ Hypertension ? ▪ Sedentary, gained 3 kg in the last 12 months	
Recent exams	**BP**	125/80 mmHg
	BMI	29 kg/m²
	A1C	7.1% ?
	eGFR	78 mL/min/1.73 m²
	uACR	1.8 mg/mmol

Medications

Sitagliptin/metformin MR 100 mg / 1000 mg DIE
Atorvastatin 20 mg DIE
Ramipril 10 mg DIE ?

Other relevant information

- No history of ASCVD or retinopathy
- Treated with sulfonylurea, but discontinued due to hypoglycemia
- RAMQ coverage ?

- With obesity
- With CVD and controlled A1C
- Experiencing fatigue and shortness of breath on exertion
- With chronic kidney disease (eGFR < 45)
- With heart failure
- With CV risk factors and A1C > target values
- Independent patient aged 80 or older, with multiple comorbidities
- Newly diagnosed with T2D

A1C: glycosylated hemoglobin; BMI: body mass index; BID: twice daily; BP: blood pressure; CV: cardiovascular; DIE: once daily; eGFR: estimated glomerular filtration rate; LDL-C: low-density lipoprotein cholesterol; T2D: type 2 diabetes; uACR: urine albumin-to-creatinine ratio.

Masked question

According to Diabetes Canada, in a patient with T2D aged 60 or older with multiple CV risk factors, which agent(s) is(are) recommended to reduce the risk of major adverse cardiovascular events (MACE)?

a) GLP-1 RA
b) SGLT2i
c) DPP-4i
d) Any one of the above
e) Either a GLP-1 RA or an SGLT2i

A1C: glycosylated hemoglobin; DPP-4i: dipeptidyl peptidase-4 inhibitor; GLP-1 RA: GLP-1 receptor agonist; SGLT-2i: sodium-glucose cotransporter 2 inhibitor; T2D: type 2 diabetes.

Discussion of the case study

Next slide

Mr. Faucher

Male, 61 years old

Multiple CV risk factors and A1C > target value:
- Hypertension
- Dyslipidemia

- Sitagliptin-metformin (Janumet XR) 100 mg / 1000 mg DIE
- Atorvastatin 20 mg DIE
- Ramipril 10 mg DIE

1. What changes would you make to optimize the patient's treatment regimen? Are you switching to a GLP-1 RA or an SGLT2i (or something else) and why? How does RAMQ coverage affect your decision?
2. Is there a class effect with SGLT2i or with GLP-1 RAs?
3. What are your priorities for non-pharmacologic interventions in a patient like this?
4. What if the A1C level was 6.4% at baseline, would you take a different approach?
5. What if the patient is under 60 years old?
6. Where do DPP-4i fit in among the treatment options for T2D?

DC 2020 | RAMQ SGLT2i | RAMQ DPP-4i | RAMQ GLP-1 RA

A1C: glycosylated hemoglobin; CV: cardiovascular; DC: Diabetes Canada; DIE: once daily; DPP-4i: dipeptidyl peptidase-4 inhibitor; GLP-1 RA: glucagon-like peptide-1 receptor agonist; RAMQ: Régie de l'assurance maladie du Québec; SGLT2i: sodium-glucose cotransporter 2 inhibitor; T2D: type 2 diabetes.

Under the mask

According to Diabetes Canada, in a patient with T2D aged 60 or older with multiple CV risk factors, which agent(s) is(are) recommended to reduce the risk of major adverse cardiovascular events (MACE)?

a) GLP-1 RA
b) SGLT2i
c) DPP-4i
d) Any one of the above
e) Either a GLP-1 RA or an SGLT2i

A1C: glycosylated hemoglobin; DPP-4i: dipeptidyl peptidase-4 inhibitor; GLP-1 RA: GLP-1 receptor agonist; SGLT-2i: sodium-glucose cotransporter 2 inhibitor; T2D: type 2 diabetes.

Key points of the case study

In patients aged 60 years and over with T2D and ≥ 2 CV risk factors, a GLP-1 RA is recommended to reduce the risk of MACE and an SGLT-2i is recommended to reduce the risk of HHF and nephropathy progression.

Even if these patients achieve the target A1C with another agent, it would be appropriate to switch to an SGLT2i or a GLP-1 RA due to their organ-protective effects.

In the absence of clinical trials comparing the different agents, the choice of a therapeutic class or agent should be based on the patient's clinical characteristics, as well as on a discussion of his or her priorities, in order to reach a shared decision.

A1C: glycosylated hemoglobin; CV: cardiovascular; DPP-4i: dipeptidyl peptidase-4 inhibitor; GLP-1 RA: glucagon-like peptide-1 receptor agonist; HHF: hospitalization for heart failure; MACE: major adverse cardiovascular events; SGLT2i: sodium-glucose cotransporter 2 inhibitor; T2D: type 2 diabetes

Mystery patients menu

Who is the mystery patient?

Click ? to reveal a parameter and explain your reasoning

Sex and age	Female, 71 years old ?	
T2D	For 13 years ?	
Relevant history	▪ Recent NSTEMI ▪ Stenting 2 months ago ? ▪ Hypertension ▪ Obesity	
Recent exams	**BP**	124/78 mmHg
	BMI	30 kg/m²
	A1C	6.8% ?
	eGFR	65 mL/min/1.73 m²
	uACR	4.0 mg/mmolμ

Medications

Metformin 1000 mg BID
Gliclazide MR 60 mg BID
Enteric-coated ASA 81 mg DIE
Ticagrelor 90 mg BID ?
Ezetimibe 10 mg DIE
Atorvastatin 80 mg DIE
Ramipril 5 mg BID
Bisoprolol 10 mg DIE

Other relevant information

No heart failure
LVEF=55%
Has a good prescription drug insurance plan ?

- With obesity
- With CVD and controlled A1C
- Experiencing fatigue and shortness of breath on exertion
- With chronic kidney disease (eGFR < 45)
- With heart failure
- With CV risk factors and A1C > target values
- Independent patient aged 80 or older, with multiple comorbidities
- Newly diagnosed with T2D

A1C: glycosylated hemoglobin; BID: twice daily; BMI: body mass index; BP: blood pressure; CV: cardiovascular; CVD: CV disease; eGFR: estimated glomerular filtration rate; LVEF: left ventricular ejection fraction; NSTEMI: non-ST-segment elevation myocardial infarction; uACR: urine albumin-to-creatinine ratio

Masked question

A patient with T2D and ASCVD is taking metformin and a DPP-4i, and his or her A1C is well below the target value. Based on the Diabetes Canada guidelines, what changes should you consider?

a) Replace metformin with an SGLT2i or a GLP-1 RA

b) Replace the DDP-4i with an SGLT2i or a GLP-1 RA

c) Add an SGLT2i or a GLP-1 RA to the current regimen

d) Add an SGLT2i and a GLP-1 RA to the current regimen

A1C: glycosylated hemoglobin; ASCVD: atherosclerotic cardiovascular disease; DPP-4i: dipeptidyl peptidase-4 inhibitor; GLP-1 RA: GLP-1 receptor agonist; SGLT2i: sodium-glucose cotransporter 2 inhibitor; T2D: type 2 diabetes

Discussion of the case study

Next slide

Ms. Caron

Female, 71 years old

CVD with controlled A1C

- Metformin 1000 mg BID
- Gliclazide MR 60 mg BID
- Enteric-coated ASA 81 mg DIE
- Ticagrelor 90 mg BID
- Ezetimibe 10 mg DIE
- Atorvastatin 80 mg DIE
- Ramipril 5 mg BID
- Bisoprolol 10 mg DIE

1. What changes would you make to optimize the patient's treatment regimen? Would you switch to a GLP-1 RA or an SGLT2i (or another option) and why?
2. Are you satisfied with the A1C level (6.8%) or would you seek to lower it further? If after 6 months, A1C were to decrease to 5.5%, how would you adjust the antihyperglycemic regimen?
3. When would you consider using a GLP-1 RA and an SGLT2i in combination?
4. What if the patient's BP was 132/82 mmHg instead of 124/78 mmHg, how would your recommendations differ?

DC 2020 | SGLT2i evidence | GLP-1 RA evidence | How to choose?

A1C: glycosylated hemoglobin; BID: twice daily; BP: blood pressure; CV: cardiovascular; DC: Diabetes Canada; DIE: once daily; GLP-1 RA: glucagon-like peptide-1 receptor agonist; HF: heart failure; SGLT2i: sodium-glucose cotransporter 2 inhibitor..

Under the mask

A patient with T2D and ASCVD is taking metformin and a DPP-4i, and his or her A1C is well below the target value. Based on the Diabetes Canada guidelines, what changes should you consider?

a) Replace metformin with an SGLT2i or a GLP-1 RA

b) Replace the DDP-4i with an SGLT2i or a GLP-1 RA

c) Add an SGLT2i or a GLP-1 RA to the current regimen

d) Add an SGLT2i and a GLP-1 RA to the current regimen

A1C: glycosylated hemoglobin; ASCVD: atherosclerotic cardiovascular disease; DPP-4i: dipeptidyl peptidase-4 inhibitor; GLP-1 RA: GLP-1 receptor agonist; SGLT2i: sodium-glucose cotransporter 2 inhibitor; T2D: type 2 diabetes

Key points of the case study

In patients with ASCVD and T2D, a GLP-1 RA is recommended to reduce the risk of MACE and an SGLT2i is recommended to reduce the risk of MACE, HHF, and progression of nephropathy.

Even if these patients achieve the target A1C with another agent, switching to an SGLT2i or GLP-1 RA is appropriate because of their protective effects on organs.

The lower the A1C, the better!

When an antihypertensive is added to an ACEi, a dihydropyridine calcium channel blocker (CCB) is preferable to thiazide or thiazide-like diuretics.

A1C: glycosylated hemoglobin; ACE: angiotensin-converting enzyme; ASCVD: atherosclerotic cardiovascular disease; CV: cardiovascular; DPP-4i: dipeptidyl peptidase-4 inhibitor; GLP-1 RA: glucagon-like peptide-1 receptor agonist; HHF: hospitalization for heart failure; MACE: major adverse cardiovascular events; SGLT2i: sodium-glucose cotransporter 2 inhibitor.

Mystery patients menu

Key messages from the speaker

Questions?

Please complete the evaluation form at

http://evaluation.fmoq.org

To obtain a copie of the program deck and access other resources about diabetes, please visit the program website at https://www.cpdnetwork.org/fr/microsites/le-patient-masque and input the password: diabetes