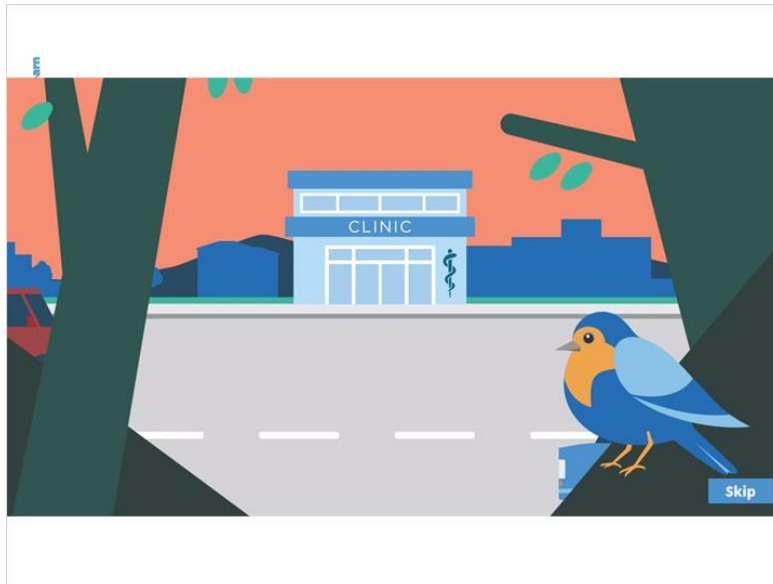


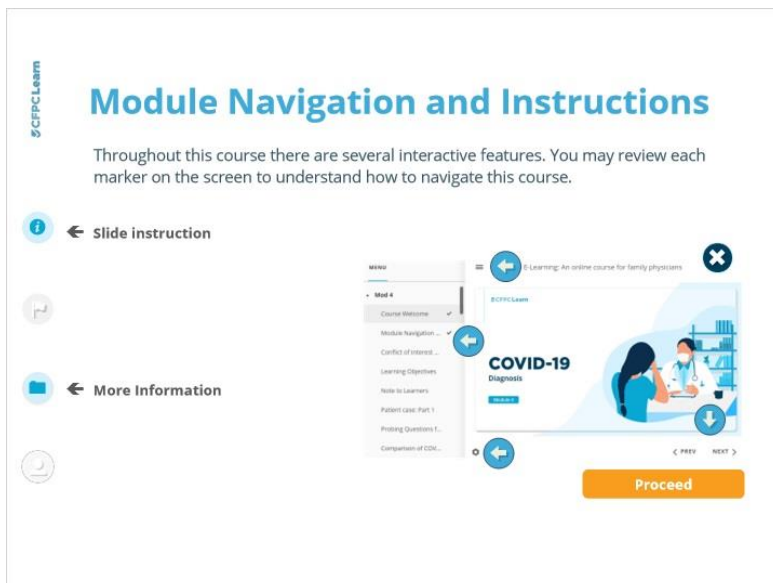
Case 40 Mr Ramakanta, Part III

1. Introduction

1.1 Intro Video



1.2 Module Navigation and Instructions



1.3 Learning Objectives

CFPC Learn

Learning Objectives

At the end of this module participants should be able to:

1. Identify key factors/findings in family medicine to help establish common clinical diagnoses.
2. Evaluate best evidence/guidance and practice tools to determine preferred treatment options for patients.
3. Synthesize patient preference, evidence and experience to formulate comprehensive plans for patient cases.

Approximately 15 minutes to complete each patient case.

Proceed

2. Patient name

2.1 Meet your patient

CFPC Learn


Mr. Ramakanta, 75

Two weeks ago, you saw Mr. Ramakanta to follow up after a recent hospitalization for heart failure (new diagnosis). His medications are as follows:

- ASA 81mg daily
- Atorvastatin 80mg daily
- Furosemide 40mg BID
- Candesartan 8mg daily
- Bisoprolol 2.5mg daily
- Spironolactone 12.5mg daily

Conversation

What do you think?



Conversation (Slide Layer)

Mr. Ramakanta, 75

Mr. Ramakanta: Hi Doc! Okay, I'm ready for those other medications you wanted to talk about. I feel fine with the ones you gave me so far.

Conversation

What do you think?

2.2 Multiple choice question

(Multiple Choice, 10 points, 1 attempt permitted)

Which of the following statements about SGLT-2 inhibitors is most accurate?



- SGLT-2 inhibitors should only be prescribed for patients with diabetes.
- SGLT-2 inhibitors do not commonly cause acute kidney injury.
- SGLT-2 inhibitors have a larger mortality reduction than ACE inhibitors or ARBs.

Submit

2.3 Answer Review

CFPCLearn

Review



Answer: The correct answer is “b,” SGLT-2 inhibitors do not commonly cause acute kidney injury.

SGLT-2: Efficacy

SGLT-2: Harms I

SGLT-2: Harms II



Click on the buttons to view additional information

Moving Forward

insert (Slide Layer)

CFPCLearn

Review



Answer: The correct answer is “b,” SGLT-2 inhibitors do not commonly cause acute kidney injury.

SGLT-2: Efficacy

SGLT-2: Harms I

SGLT-2: Harms II

Two large randomized controlled trials of symptomatic heart failure patients randomized to SGLT-2 inhibitors or placebo were followed for approximately 1.5 years.

The relative reduction was:



- Mortality: ~13% (versus ~20-25% with other agents)
- Heart failure hospitalizations: ~30% (similar to other agents)

Moving Forward

insert II (Slide Layer)

SCFPCLearn

Review



Answer: The correct answer is "b," SGLT-2 inhibitors do not commonly cause acute kidney injury. X

SGLT-2: Efficacy

SGLT-2: Harms I

SGLT-2: Harms II

In these trials, there was:



- No significant hypotension or acute kidney injury.
- No electrolyte disturbances.

Moving Forward

insert III (Slide Layer)

SCFPCLearn

Review



Answer: The correct answer is "b," SGLT-2 inhibitors do not commonly cause acute kidney injury. X

SGLT-2: Efficacy

SGLT-2: Harms I

SGLT-2: Harms II

Genital infections were increased with SGLT-2 inhibitors: 1.7% versus 0.6% (placebo).

The efficacy of SGLT-2 inhibitors was similar in those with and without diabetes.

Moving Forward

2.4 Meet your patient

CFPC Learn


Mr Ramakanta, 75

Mr. Ramakanta: Just to make sure I get this right – you are saying that heart failure is a big deal. I may go back to the hospital if my lungs fill up with water again. All these medications can decrease my chance of dying and ending up in the hospital.

You are already on candesartan, bisoprolol and spironolactone. We'll add one new one: empagliflozin.

Anything else I should know? I saw an ad for a new heart failure pill.

Moving Forward



2.5 Multiple choice question

(Multiple Response, 10 points, 1 attempt permitted)

CFPC Learn


Which of the following about the combination of sacubitril-valsartan (ARNI) is the most accurate?

Select all that apply.

- Sacubitril-valsartan can only be prescribed by heart failure specialists.
- Sacubitril-valsartan should be considered for patients still symptomatic despite therapy.
- Sacubitril-valsartan rarely causes hypotension.
- Sacubitril-valsartan decreases mortality.

ARNI = angiotensin receptor-neprilysin inhibitor



Submit



2.6 Answer Review

CFPC Learn

Review: Sacubitril-valsartan



Answer: The correct answer is sacubitril-valsartan should be considered if patients are still symptomatic and they can decrease mortality.

Indication

Benefit



Optimizing therapy

Moving Forward

indication (Slide Layer)

CFPC Learn

Review: Sacubitril-valsartan



Answer: The correct answer is sacubitril-valsartan should be considered if patients are still symptomatic and they can decrease mortality. X

Indication

Benefit

Optimizing therapy

From the Canadian Cardiovascular Society (2021):



- If new diagnosis and hospitalized, start sacubitril-valsartan instead of ACEi or ARB
- If on ACEi or ARB and symptomatic, switch to sacubitril-valsartan
- If switching from ACEi, there needs to be a washout period of 2-3 days to decrease the risk of angioedema

Moving Forward

benefit (Slide Layer)

SCFCLearn

Review: Sacubitril-valsartan



Answer: The correct answer is sacubitril-valsartan should be considered if patients are still symptomatic and they can decrease mortality.

Indication

Benefit

Optimizing therapy



- In a randomized controlled trial, approximately 8000 symptomatic patients with ejection fraction ~30% were randomized to switching to sacubitril-valsartan versus staying on ACEi.
- At 2 years, the relative reduction in all-cause mortality was 15% favouring the switch.
- More symptomatic hypotension was observed with sacubitril-valsartan (14% versus 9%).
- Cost ~\$250 per month.

Moving Forward

Optimizing therapy (Slide Layer)

SCFCLearn

Review: Sacubitril-valsartan



Answer: The correct answer is sacubitril-valsartan should be considered if patients are still symptomatic and they can decrease mortality.

Indication

Benefit

Optimizing therapy

The Canadian Cardiovascular Society's heart failure guidelines (2021) indicate that "initiation and titration of standard therapies should be embraced by non-specialists."

If patients remain symptomatic and/or ejection fraction does not improve despite maximally tolerated doses, specialists can assess for additional therapies (examples: ivabradine, vericiguat).

Moving Forward

2.7 Answer Review

CFPCLearn

Review

Let's Recap!

| Intervention | All-cause mortality: Relative Reduction |
|--|---|
| ACEI or ARBs | ~20-25% |
| Beta-blockers | ~20-25% |
| Spironolactone | ~20-25% |
| Added to the above: | |
| SGLT-2 inhibitors | ~10-15% |
| Sacubitril-valsartan (switching from ACEI/ARB) | ~10-15% |

Additional notes:

- SGLT-2 inhibitors: taken once daily, ~\$3-4/day
- Sacubitril-valsartan: BID dosing, hypotension can occur; ~\$9-10/day

Moving Forward

2.8 Match the medication with the most appropriate statement:

(Matching Drop-down, 10 points, 1 attempt permitted)

CFPCLearn

Matching Question



Match the medication with the most appropriate statement:

| | |
|------------------------|--|
| ACE inhibitors or ARBs | An increase of eGFR of up to 30% can happen. There is no need to decrease the dose. Cannot be prescribed at the same time as an ARNI. |
| Beta-blockers | Slow titration may be needed. Transient fluid retention with exacerbation of heart failure is possible. May need to increase diuretic dose. |
| Spironolactone | Should be avoided if eGFR < 30ml/min. Despite its use for patients with resistant hypertension, it has minimal effect on blood pressure when used for heart failure. |
| Sacubitril-valsartan | Can cause hypotension and decreased diuretic requirements. ACEI needs to be discontinued or changed for an ARB for 2-3 days prior to starting it. |
| SGLT-2 inhibitor | Reduction of eGFR is possible. Can promote diuresis (diuretics may need to be decreased or stopped). May reduce the incidence of hyperkalemia. |

2.9 Answer Review

CFPCLearn

Review



Answer: Click on the buttons to view correct answers.

- ACEI, ARB, BB
- Sacubitril-Valsartan
- Spironolactone
- Spironolactone: Tips
- SGLT-2 inhibitors
- SGLT-2i: Tips



Click on the buttons to view additional information

Moving Forward

ACEI, ARB, BB (Slide Layer)

CFPCLearn

Review



Answer: Click on the buttons to view correct answers.

- ACEI, ARB, BB
- Sacubitril-Valsartan
- Spironolactone
- Spironolactone: Tips
- SGLT-2 inhibitors
- SGLT-2i: Tips

The correct answers are as follows:



- **ACEI/ARB:** An increase of eGFR of up to 30% can happen. There is no need to decrease the dose. Cannot be prescribed at the same time as an ARNI.
- **Beta-blockers:** Slow titration may be needed. Transient fluid retention with exacerbation of heart failure is possible. May need to increase diuretic dose.

Moving Forward

S-V (Slide Layer)

SCFPCLearn

Review



Answer: Click on the buttons to view correct answers. X

- ACEI, ARB, BB
- Sacubitril-Valsartan**
- Spironolactone
- Spironolactone: Tips
- SGLT-2 inhibitors
- SGLT-2i: Tips

The correct answer is as follows:



- Sacubitril-valsartan: Can cause hypotension and decreased diuretic requirements. ACEi needs to be discontinued or changed for an ARB for 2-3 days prior to starting it.

Moving Forward

Spironolactone (Slide Layer)

SCFPCLearn

Review



Answer: Click on the buttons to view correct answers. X

- ACEI, ARB, BB
- Sacubitril-Valsartan
- Spironolactone**
- Spironolactone: Tips
- SGLT-2 inhibitors
- SGLT-2i: Tips

Spironolactone:



- Correct answer: Should be avoided if eGFR < 30ml/min. Despite its use for patients with resistant hypertension, it has minimal effect on blood pressure when used for heart failure.

Moving Forward

Spir - tips (Slide Layer)

SCFPCLearn

Review



Answer: Click on the buttons to view correct answers.

- ACEI, ARB, BB
- Sacubitril-Valsartan**
- Spironolactone
- Spironolactone: Tips
- SGLT-2 inhibitors
- SGLT-2i: Tips

Patients with heart failure (reduced ejection fraction) were randomized to mineralocorticoid receptor antagonist (MRA) or placebo:



- Systolic BP change at 6 months: Spironolactone group had BP 2.6mmHg lower than placebo
- Hypotension: 4.6% versus 3.9% (placebo)
- Low systolic BP is not a reason to withhold MRAs.

Moving Forward

sglt-2 i (Slide Layer)

SCFPCLearn

Review



Answer: Click on the buttons to view correct answers.

- ACEI, ARB, BB
- Sacubitril-Valsartan**
- Spironolactone
- Spironolactone: Tips
- SGLT-2 inhibitors
- SGLT-2i: Tips

SGLT2 inhibitors:


- Correct answer: Reduction of eGFR is possible. Can promote diuresis (diuretics may need to be decreased or stopped). May reduce the incidence of hyperkalemia.

Moving Forward

sgltt-2 tips (Slide Layer)

SCFPCLearn

Review



Answer: Click on the buttons to view correct answers.

- ACEI, ARB, BB
- Sacubitril-Valsartan
- Spironolactone
- Spironolactone: Tips
- SGLT-2 inhibitors
- SGLT-2i: Tips

SGLT2-inhibitor Tips


- In a subgroup analysis of a randomized trial, empagliflozin reduced the incidence of hyperkalemia (6.5% versus 7.7% placebo).

Moving Forward

2.10 Meet your patient

SCFPCLearn

Mr Ramakanta, 75



For now, we'll just do the four medications - candesartan, spironolactone, bisoprolol and empagliflozin. We'll see how you feel and re-assess.

Ok, I'll keep checking my blood pressure. So far, it's been fine!



Moving Forward

2.11 True or false

(Multiple Choice, 10 points, 1 attempt permitted)

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True or False?



i It is very important to reach target doses in heart failure. This may necessitate a referral to heart failure clinic.

True



False

Submit

2.12 Answer Review

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Review



i **Answer:** The correct answer is "false."

Target doses

Tolerability

Titration

Time frame



Click on the buttons to view additional information

Moving Forward

Target (Slide Layer)

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Review



Answer: The correct answer is "false."

Target doses

Tolerability

Titration

Time frame



- Target doses are often not attainable. In trials, target doses were reached in 17-61% of patients.
- Higher doses of ACEI, ARBs or beta-blockers lead to:
 - non-significant improvement in mortality
 - inconsistent decreases in heart failure hospitalizations
 - more side effects.

Moving Forward

Tolerability (Slide Layer)

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Review



Answer: The correct answer is "false."

Target doses

Tolerability

Titration

Time frame



Focusing on tolerability is essential. The Canadian Cardiovascular Society guidelines use "maximally tolerated doses," rather than "target doses."

Moving Forward

Titration (Slide Layer)

SCFPCLearn

Review



Answer: The correct answer is "false."

Target doses

Tolerability

Titration

Time frame



- It is not known whether medications should be up-titrated simultaneously or one at a time. It is likely patient dependent. Examples:
 - Low blood pressure: could prioritize spironolactone
 - Volume overloaded or concerns with hyperkalemia: empagliflozin may be a good choice

Moving Forward

Time frame (Slide Layer)

SCFPCLearn

Review



Answer: The correct answer is "false."

Target doses

Tolerability

Titration

Time frame

- Ideally patients should be on their maximally tolerated doses within 3-6 months. Beta-blockers are the only medication that should be slowly uptitrated due to the risk of worsening heart failure.

Moving Forward

2.13 Let's Make a Plan

The screenshot shows a user interface for a learning module. On the left is a vertical sidebar with icons for home, back, forward, and search. The main content area has the title 'Let's Make a Plan' in blue. To the right is a circular profile picture of a man and a clipboard icon. Below the title is a text box with instructions: 'Write down your patient plan. It can include the following: lifestyle or prescription intervention(s), lab(s)/test(s) required, follow up appointment, and referrals required.' Below this is a large light blue text input area with the placeholder text 'Fill in your plan for the patient here'. To the left of this area are five small circular icons representing different plan components. At the bottom right of the input area is an orange button that says 'See how your plan compares'.



2.14 Plan Answers

The screenshot shows a user interface for a learning module. On the left is a vertical sidebar with icons for home, back, forward, and search. The main content area has the title 'Mr Ramakanta, 75 years' in blue. To the right is a circular profile picture of a man and a scales icon. Below the title is a text box with instructions: 'These are some potential points for the patient. How does your plan compare?'. Below this is a list of five blue buttons: 'Vitals', 'Medications', 'Labs', 'Follow up - I', and 'Follow up - II'. Below the buttons is a green button that says 'What's in a name?'. To the right of the buttons is a large light blue text area with the text 'Click on the buttons to see suggested answers'.

Vitals (Slide Layer)

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Mr Ramakanta, 75 years



These are some potential points for the patient.
How does your plan compare?

Vitals

Medications

Labs

Follow up - I


Follow up - II

What's in a name?

Vitals

Recall, Mr. Ramakanta's vitals and bloodwork are as follows:



- BP 115/85, HR 77
- Na 138 mmol/L, K 4.2 mmol/L
- No symptoms of hypotension



Medications (Slide Layer)

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Mr Ramakanta, 75 years



These are some potential points for the patient.
How does your plan compare?

Vitals

Medications

Labs

Follow up - I


Follow up - II

What's in a name?

Medications

Within one month of heart failure diagnosis, Mr. Ramakanta is now on:



- Furosemide 40mg daily (you decrease to 20mg daily)
- You start empaglifozlin 10mg daily (at "target dose")
- He will continue candesartan 8mg daily (target 32mg), bisoprolol 2.5 daily (target 10mg), spironolactone 25mg (at target).



Labs (Slide Layer)

SCFFCLearn


Mr Ramakanta, 75 years




These are some potential points for the patient.
How does your plan compare?

- Vitals
- Medications
- Labs
- Follow up - I
- Follow up - II

What's in a name?



 You give him a lab requisition for creatinine, potassium, sodium.



f.u (Slide Layer)

SCFFCLearn


Mr Ramakanta, 75 years




These are some potential points for the patient.
How does your plan compare?

- Vitals
- Medications
- Labs
- Follow up - I
- Follow up - II

What's in a name?

 You book a follow up appointment in two weeks to discuss lab results and blood pressure. You may increase his medications as tolerated and stop his furosemide if his blood pressure is low and he is euvolemic.



Name (Slide Layer)

SCFPCLearn

Mr Ramakanta, 75 years

These are some potential points for the patient.
How does your plan compare?

- Vitals
- Medications
- Labs
- Follow up - I
- Follow up - II

What's in a name?

What is the meaning behind the patient's name?

Dr. Ramakanta was the son of a farmer. He is a famous cardiovascular surgeon from India. As per Wikipedia, he was once called "one of the safest heart surgeons in the world."

f.u, ii (Slide Layer)

SCFPCLearn

Mr Ramakanta, 75 years

These are some potential points for the patient.
How does your plan compare?

- Vitals
- Medications
- Labs
- Follow up - I
- Follow up - II



What's in a name?

At his next follow up, you can consider: if he remains symptomatic and has no hypotension, you will change the candesartan to sacubitril-valsartan.

2.15 References

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References



Thanks for visiting the clinic!

References for this case are available [here](#).

This activity is eligible for up to 0.25 Mainpro+ credits.

