How to pass the MD Viva
Current evidence and literature

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Clinical scenario

A 55-year-old woman with a 10-year history of type 2 diabetes mellitus and hypertension presents for follow-up. She complains of loss of appetite, and ankle swelling over the last two months and fatigue. She has no any chest pain, difficulty in breathing, or palpitations. Her past records reveal poorly controlled type 2 diabetes, hypertension, and retinopathy. She is currently on metformin 1000 mg twice daily, Ramipril 10 mg daily, and Diltiazem SR 90mg once daily. Her blood pressure is 150/90 mmHg, heart rate 72 bpm. Physical examination reveals bilateral pitting ankle oedema.

The laboratory investigations showed a HBA1C of 8.6%, serum creatinine of 2.0 mg/dL (baseline 1.8 mg/dL), an estimated glomerular filtration rate (eGFR) of 27 mL/min/1.73 m^2, and albuminuria with a urine protein-to-creatinine ratio (UPCR) of 700 mg/g.

Discussion

1. What is/are the clinical problem/s?
2. What are the important steps in her management?
3. What is the most appropriate pharmacological agent that would be useful in her management based on current evidence?

4. What are the other pharmacological options that may be considered based on Current evidence?

What is the clinical problem?

- eGFR 27 mL/min/1.73 m^2 → CKD G4
- UPCR 700 mg/g → Severe albuminuria (A3)
- Creatinine rising (1.8 → 2.0 mg/dL) → disease progression
- HbA1c 8.6% → poor glycaemic control
- BP 150/90 mmHg → uncontrolled
- Current therapy: Metformin, Ramipril 10 mg, Diltiazem SR 90 mg

Important steps in her management

- A. Confirm progression and risk stratification
- B. Optimise renin angiotensin aldosterone blockade
- Initiate SGLT 2 inhibitor – Most single important pharmacological step
- Add Finerenone
- Glycaemmic optimisation
- Blood pressure and volume optimisation
- Cardiovascular risk reduction
- CKD care and nephrology referral

Risk stratification - KDIGO Classsification

Prognosis of CKD by GFR and albuminuria categories: KDIGO 2012

GFR categories (ml/min/1.73 m²) Description and range				Persistent albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				< 30 mg/g < 3 mg/mmol	30–300 mg/g 3–30 mg/mmol	> 300 mg/g > 30 mg/mmol
	G1	Normal or high	≥ 90			
	G2	Mildly decreased	60–89			
	G3a	Mildly to moderately decreased	45–59			
	G3b	Moderately to severely decreased	30–44			
	G4	Severely decreased	15–29			
	G5	Kidney failure	< 15			

What is the most appropriate pharmacological agent that would be useful in her management based on current evidence?

Initiate an SGLT2 inhibitor—this is the single most important pharmacological step

Why?

- SGLT2 inhibitors reduce intraglomerular hypertension by restoring tubuloglomerular feedback.
- This reduces glomerular hyperfiltration and slows structural damage independent of glycaemia.

What is the most appropriate pharmacological agent that would be useful in her management based on current evidence?

Evidence summary

- **DAPA-CKD (Dapagliflozin)**
  - 39% reduction in composite renal endpoint
  - Benefits **persisted in non-diabetics**, proving glycaemia-independent effect
- **EMPA-KIDNEY (Empagliflozin)**
  - Included eGFR down to **20 mL/min**
  - 28% reduction in kidney disease progression
- **CREDENCE (Canagliflozin)**
  - 30% reduction in ESRD
  - 20% reduction in cardiovascular events

At eGFR 27, SGLT2 inhibitors are guideline-mandated.

Choice of agent

- **Empagliflozin 10 mg** or **Dapagliflozin 10 mg** are preferred because
  - robust renal outcome data
  - licensed for use ≥ eGFR 20

What are the other pharmacological options that may be considered based on Current evidence?

Add Finerenone (Non-steroidal MRA)

Only drug class proven to reduce both renal AND cardiovascular risk on top of ACEI/ARB in diabetic CKD with albuminuria.

Evidence

- **FIDELIO-DKD**
  - 18% reduction in CKD progression
- **FIGARO-DKD**
  - 13% reduction in CV composite events
- **Fidelity pooled analysis**
  - 14% reduction in CV death, MI, stroke, HF hospitalization

Finerenone has a **lower risk of hyperkalaemia** than spironolactone due to its receptor selectivity.

Pre-requisites:

- Potassium < 4.8
- eGFR ≥ 25

She qualifies.

Glycaemic optimisation—metformin dose has to be reduced and has to be stopped if EGFR persistently <30

- **ADA and KDIGO state metformin is contraindicated at eGFR <30 due to lactic acidosis risk.**
- **Her eGFR is 27 → need to stop**

Replacement therapy

Strongest evidence:

GLP-1 RA (Semaglutide / Dulaglutide) → recommended in DKD with inadequate glycaemic control.

Why GLP-1RA?

- CV benefit in diabetic CKD is well established.
- Renal benefit (albuminuria reduction; FLOW trial showed slowing renal decline).
- Weight loss improves BP, glycaemia, and proteinuria.

Insulin

- May be necessary if A1c remains >8% after GLP-1RA initiation.
- Dose reductions often required in CKD due to reduced clearance.

Blood pressure & volume optimization

. Her BP 150/90 is above the KDIGO 2024 target of <130/80.

1. Stop Diltiazem
•Non-dihydropyridine CCBs worsen oedema
•Reduce cardiac output
•Offer no specific renal protective effect

2. Start a loop diuretic
•Addresses oedema and helps reach BP goal
•Furosemide or torsemide (torsemide has better oral bioavailability)

3. If still uncontrolled
Add **Chlorthalidone**
•CLICK trial: effective even at eGFR 23
•Reduces proteinuria
Amlodipine may be added but can exacerbate oedema—use after diuretics.

Cardiovascular risk reduction

Statin therapy

- CKD + diabetes = statin mandatory
- Atorvastatin 20–40 mg or Rosuvastatin 10 mg (adjust dose in CKD)

Lifestyle measures

- Sodium restrict to 2 g/day
- Protein intake 0.6–0.8 g/kg/day
- Encourage weight loss → reduces albuminuria
- Smoking cessation strongly reduces progression risk

CKD complications

- Screen for anaemia of CKD
- Check bicarbonate (treat if <22 mmol/L)
- Avoid NSAIDs, radiocontrast
- Vaccinations: influenza, pneumococcal (PCV20 or PCV13 + PPSV23)

Nephrology referral

- Indicated because:
- eGFR < 30
- A3 proteinuria
- Rapid progression
- Need for triple therapy: ACEI + SGLT2i + Finerenone
- Discuss renal replacement education early (shared decision-making)

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- MOST APPROPRIATE PHARMACOLOGICAL AGENT
- ★ Answer: An SGLT2 inhibitor
- (Specifically Empagliflozin 10 mg or Dapagliflozin 10 mg)
- Consultant justification:
- Largest absolute and relative reduction in renal endpoints
- Strongest evidence across all eGFR levels down to 20
- Multi-mechanistic protection:
- ↓ intraglomerular pressure
- ↓ albuminuria
- ↓ tubular stress
- ↓ inflammation & fibrosis
- ↓ heart failure events

- OTHER PHARMACOLOGICAL OPTIONS (Consultant-level detail)
- A. Finerenone
- The only ns-MRA with proven outcome benefits in diabetic CKD.
- Benefits:
- ↓ CKD progression
- ↓ CV death, MI, stroke
- ↓ HF hospitalisation
- Use after confirming potassium < 4.8.

- GLP-1 receptor agonist (Semaglutide / Dulaglutide)
- Role in this patient:
- HbA1c 8.6%
- Needs weight reduction
- Has established microvascular disease
- Now metformin-ineligible
- Provides:
- CV benefit
- Albuminuria reduction
- Slowing of eGFR decline (FLOW trial)

- C. Diuretics
- Loop diuretics essential
- Thiazide-like diuretics (chlorthalidone) useful even in late CKD
- Reduce volume load and BP

- D. Statins
- High CV risk
- CKD + diabetes = statin mandatory regardless of LDL

- E. Insulin
- Use if glycaemia requires tightening
- Lower doses needed due to reduced renal clearance