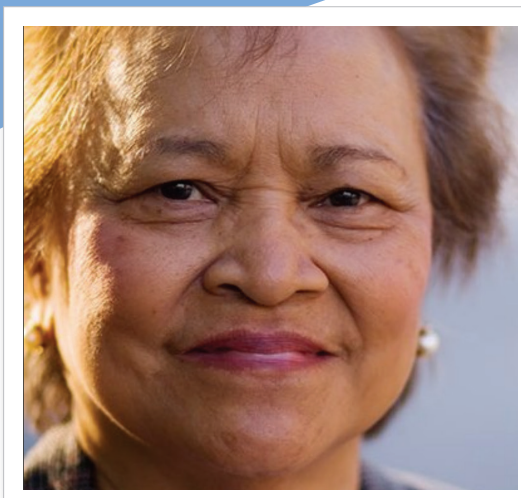
# Meet Eleanoa



## Learning Outcomes

- Selection of glucose lowering medications in patients with chronic kidney disease
- Approach to recurrent hypoglycaemia
- Assessment of diabetes related microvascular complications and their management
- Individualising glycaemic treatment targets depending on patient wishes, comorbidities and hypoglycaemia risk

## VISIT ONE

Eleanoa is a 74-year old female who has recently attended your practice after moving to Australia from Fiji. She has type 2 diabetes (diagnosed 12 years ago) complicated by chronic kidney disease. She had seen a nephrologist many years ago when first diagnosed. Eleanoa's daughter Kelly is concerned about her mother having multiple episodes of hypoglycaemia especially during the day when she's home alone. She reports five episodes of hypoglycaemia a week. Eleanoa has recently reported reduced awareness of hypoglycaemia, becoming symptomatic only at BGL of 3.0 mmol/L. Several episodes have required assistance from Kelly. Eleanoa was hospitalised last week after a hypoglycaemic episode caused a fall resulting in a Colles' fracture of her left arm. She does not drink alcohol or smoke. Eleanoa does not drive.

### Current medications

Metformin 1g twice daily
Gliclazide MR 120mg daily
Perindopril 4mg daily
Aspirin 100mg daily

### Allergies

Nil known drug allergies

### Examination

Blood pressure 145/85 mmHg with no postural drop
Weight 85 kg, Height 168 cm, BMI 30 kg/m$^2$
Peripheral neuropathy in stocking distribution to ankle when tested with a 10g monofilament. Pedal pulses present.
Nil evidence of ulceration.

### Investigations

HbA1c 48 mmol/mol (6.5%)
Hb 120 g/L
Urine albumin/ creatinine ratio (ACR) 25 mg/mmol (twice)
TC 5.5 TG 1.2 HDL 0.8 LDL 2.7 mmol/L
eGFR 42 ml/min/1.73m$^2$

## What are the management issues for this patient?

- Recurrent severe hypoglycaemia and safety when home alone Management of recurrent hypoglycaemia.
- Metformin in the context of reduced renal function Individualising glycaemic treatment targets depending on patient wishes, comorbidities and hypoglycaemia risk.
- Optimise measures to maintain renal function - these include the use of appropriate glucose lowering therapies and BP therapy including an ACEi or ARB (but not both).
- Detection and management of other microvascular complications.
- Optimal management of modifiable CV risk factors. Consider evaluation for autonomic neuropathy given longstanding diabetes with peripheral neuropathy in a frail elderly patient with falls. Lying and standing BP and refer for further testing if required.
- Management of diabetic neuropathy, prevention of foot ulcers.
- Assess and manage osteoporosis/renal bone disease.

Australian Diabetes Society is a National Health Professional Body Agent for the NDSS.

NDSS Helpline 1800 637 700
ndss.com.au

The NDSS is administered by Diabetes Australia

Version 2 April 2022. First published November 2016.

## What is your management plan?

1. Patient's age, medical co-morbidities, frailty and recurrent hypoglycaemia with injuries suggest that an HbA1c target of 64 mmol/mol (7.5 - 8%) would be appropriate if using therapies potentially causing hypoglycaemia. If these can be avoided, a target of 6.5 - 7% would be appropriate.
2. Reduce dose of Metformin to 1g, given renal impairment.
3. Stop gliclazide given hypoglycaemia.
4. Start SGLT2i even if this is not necessary for glycaemic control. If this is contra-indicated or not tolerated, a GLP-1RA would be an appropriate alternative.
5. Titrate anti-hypertensive therapy as tolerated - BP target would be 120/80 mmHg ideally.
6. Referral to dietician and diabetes educator (team care planning) to review diet and self-management of diabetes particularly prevention and management of hypoglycaemia.
7. Complete complications screening with ophthalmology review.
8. Refer to podiatry for assistance with nail care and provision of appropriate footwear. Advise patient of the importance of daily foot examination given neuropathy.
9. Advise use of a safety alert alarm.

# VISIT TWO

Two months later Eleanoa is now comfortable with avoiding and managing hypoglycaemia following her education session with the diabetes educator. The hypoglycaemia has stopped and hypoglycaemia awareness has returned. However, her renal function has declined further with eGFR now 35 ml/min/1.73m$^2$. Eleanoa is adamant that she will not consider dialysis. She is awaiting review by the renal team at the local hospital to exclude other causes of kidney disease and to optimise management. Eye review indicates non-proliferative diabetic retinopathy.

### Current medications

Metformin 1g daily

Diapagliflozin 10 mg daily

Perindopril 8mg daily

Aspirin 100mg daily

Atorvastatin 40 mg dail

### Examination

Blood pressure 120/80

### Investigations

HbA1c 49 mmol/mol (6.7%)

## What are the management issues for this patient?

- Investigation of declining renal function

## What is your management plan?

1. Continue dipagliflozin as temporary reversible drops in eGRF are common after SGLT2i commencement. Long term renal function is maintained more effectively by SGLT2i therapy than alternatives. Encourage liberal hydration and monitor renal function on a three-six monthly basis.
2. Metformin may need to be ceased when eGFR falls below 30 ml/min/1.73m$^2$

## Referral criteria for specialist renal care may include:

- eGFR <30 mL/min/1.73m$^2$ (Stage 4 or 5 CKD of any cause)
- persistent significant albuminuria (UACR ≥30 mg/mmol)
- a sustained decrease in eGFR of 25% or more OR a sustained decrease in eGFR of 15 mL/min/1.73m$^2$ within 12 months
- CKD with hypertension that is hard to target despite at least three antihypertensive agents

## Clinical manifestations of Diabetic Autonomic Neuropathy

| Cardiovascular | Genitourinary | Sudomotor |
|---|---|---|
| Resting tachycardia<br>Exercise intolerance<br>Orthostatic hypotension<br>Silent myocardial ischemia | Neurogenic bladder (diabetic cystopathy)<br>Erectile dysfunction<br>Retrograde ejaculation<br>Female sexual dysfunction (e.g. loss of vaginal lubrication) | Anhidrosis<br>Heat intolerance<br>Gustatory sweating<br>Dry skin |

| Gastrointestinal | Metabolic | Pupillary |
|---|---|---|
| Oesophageal dysmotility<br>Gastroparesis diabeticorum<br>Constipation<br>Diarrhea<br>Fecal incontinence | Hypoglycaemia unawareness<br>Hypoglycaemia-associated autonomic failure | Pupillomotor function impairment (e.g. decreased diameter of dark-adapted pupil)<br>Argyll-Robertson pupil |

## Additional resources


Cheung NW, Conn JJ, d'Emden MC, et al. Position statement of the Australian Diabetes Society: individualisation of glycated haemoglobin targets for adults with diabetes mellitus. Med J Aust 2009; 191: 339-344.

Shorr RI, Ray WA, Daugherty JR, Griffi n MR. Individual sulfonylureas and serious hypoglycemia in older people. J Am Geriatr Soc 1996; 44: 751-755.

Kidney Health Australia. Chronic kidney disease (CKD) management in general practice, 3rd edition. Melbourne: Kidney Health Australia. 2015.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