Type 2 Diabetes in Older Adults – The story of Mairead , Mahati and Maire

Dr Lisa Devine

The landscape

Diabetes is a highly prevalent health condition in the aging population. Over one-quarter of people over the age of 65 years have diabetes, and one-half of older adults have prediabetes

Diabetes in older adults is also a highly heterogeneous condition

Both low (< 42 mmol/mol; < 6%) and high (> 75 mmol/mol; > 9%) glycated haemoglobin (HbA1c) levels were associated with more harm than benefit in older adults

Aims

1. How to **set targets** in older adults with diabetes
2. Look at the pro's and cons of different **classes of diabetes medications** in older adults
3. Review approaches to **prescribing and deprescribing**
4. Remind ourselves to look for presence of **geriatric syndromes** in patients with diabetes
5. Look at resources available to us in managing patients with Type 2 Diabetes in need of **palliative care**

Three older adults with Diabetes : Mairead , Mahati and Maire

- All three are patient that have passed through both your surgery doors and are friends and have been members of the local active retirement group.
- You know that Maire has recently been admitted to the local nursing home and this has had a significant impact on Mairead and Mahati who both spoke about this to your practice nurse .
- Mairead – Retired shopkeeper , living independently a home
- Mahati – Retired nurse , living with family
- Maire – Retired nurse also and previous colleague of Mahati

13. Older Adults: *Standards of Medical Care in Diabetes–2022*

American Diabetes Association
Professional Practice Committee*

Diabetes Care 2022;45(Suppl. 1):S195–S207 | https://doi.org/10.2337/dc22-S013

Diabetes Ther (2021) 12:1227–1247
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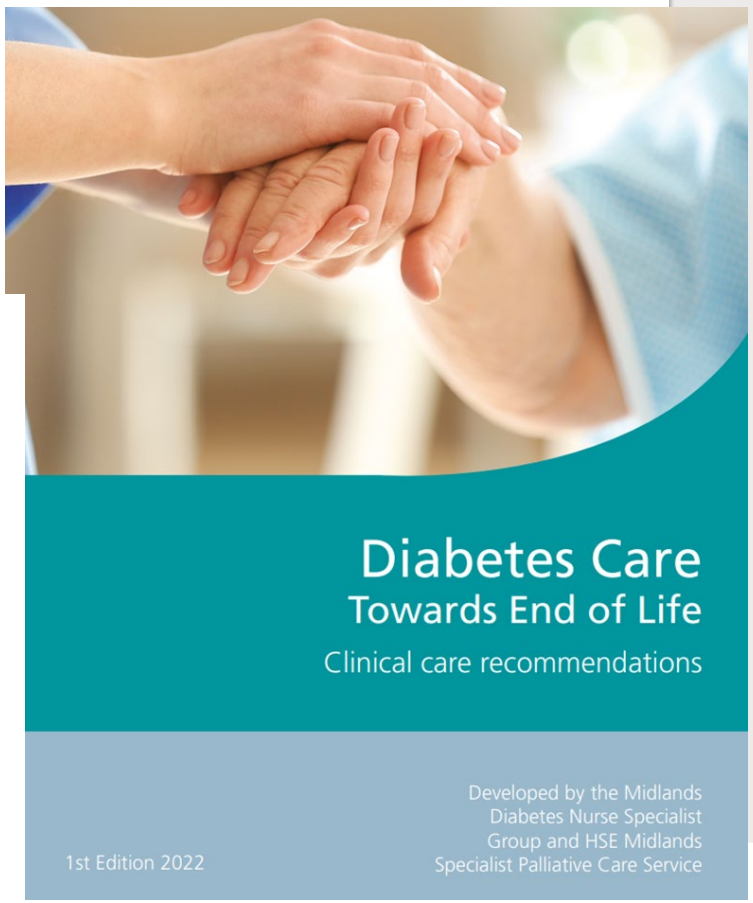
REVIEW

Diabetes and Frailty: An Expert Consensus Statement on the Management of Older Adults with Type 2 Diabetes

W. David Strain · Su Down · Pam Brown · Amar Puttanna · Alan Sinclair



HELPFUL RESOURCES IN THIS AREA

Table 13.1—Framework for considering treatment goals for glycemia, blood pressure, and dyslipidemia in older adults with diabetes

Patient characteristics/ health status	Rationale	Reasonable A1C goal‡	Fasting or preprandial glucose	Bedtime glucose	Blood pressure	Lipids
Healthy (few coexisting chronic illnesses, intact cognitive and functional status)	Longer remaining life expectancy	<7.0–7.5% (53–58 mmol/mol)	80–130 mg/dL (4.4–7.2 mmol/L)	80–180 mg/dL (4.4–10.0 mmol/L)	<130/80 mmHg	Statin, unless contraindicated or not tolerated
Complex/intermediate (multiple coexisting chronic illnesses* or two or more instrumental ADL impairments or mild-to-moderate cognitive impairment)	Intermediate remaining life expectancy, high treatment burden, hypoglycemia vulnerability, fall risk	<8.0% (64 mmol/mol)	90–150 mg/dL (5.0–8.3 mmol/L)	100–180 mg/dL (5.6–10.0 mmol/L)	<130/80 mmHg	Statin, unless contraindicated or not tolerated
Very complex/poor health (LTC or end-stage chronic illnesses** or moderate-to-severe cognitive impairment or two or more ADL impairments)	Limited remaining life expectancy makes benefit uncertain	Avoid reliance on A1C; glucose control decisions should be based on avoiding hypoglycemia and symptomatic hyperglycemia	100–180 mg/dL (5.6–10.0 mmol/L)	110–200 mg/dL (6.1–11.1 mmol/L)	<140/90 mmHg	Consider likelihood of benefit with statin

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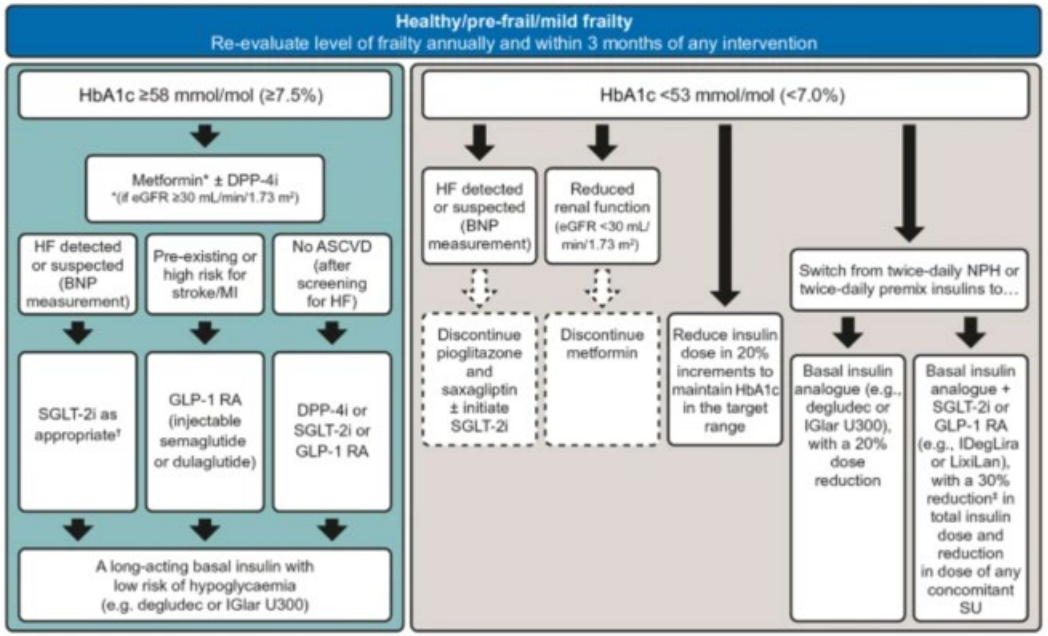

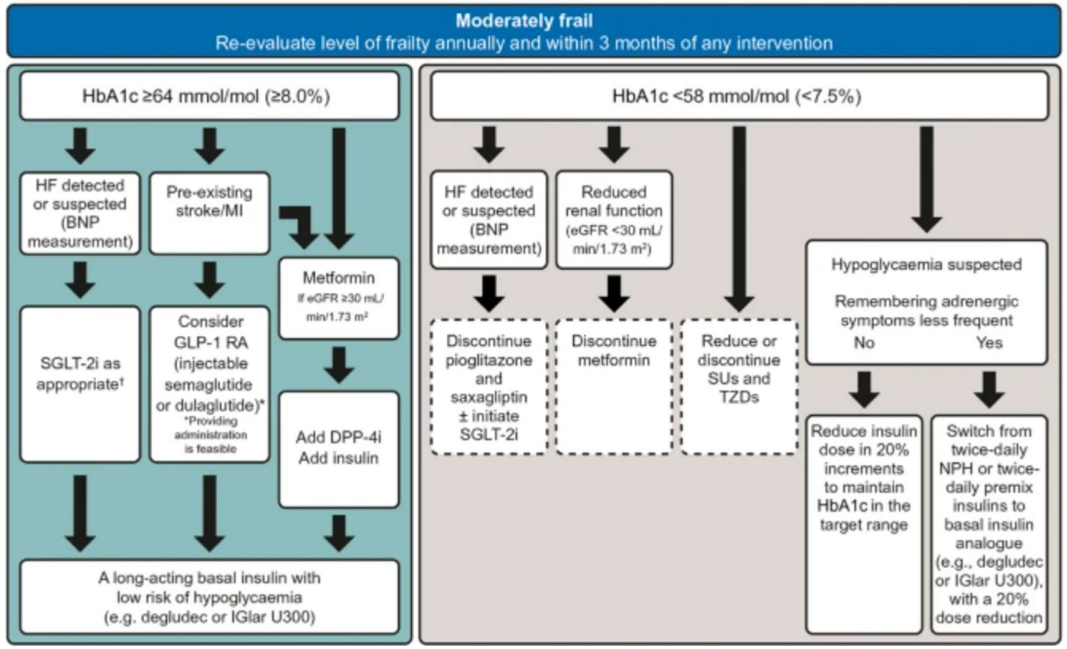

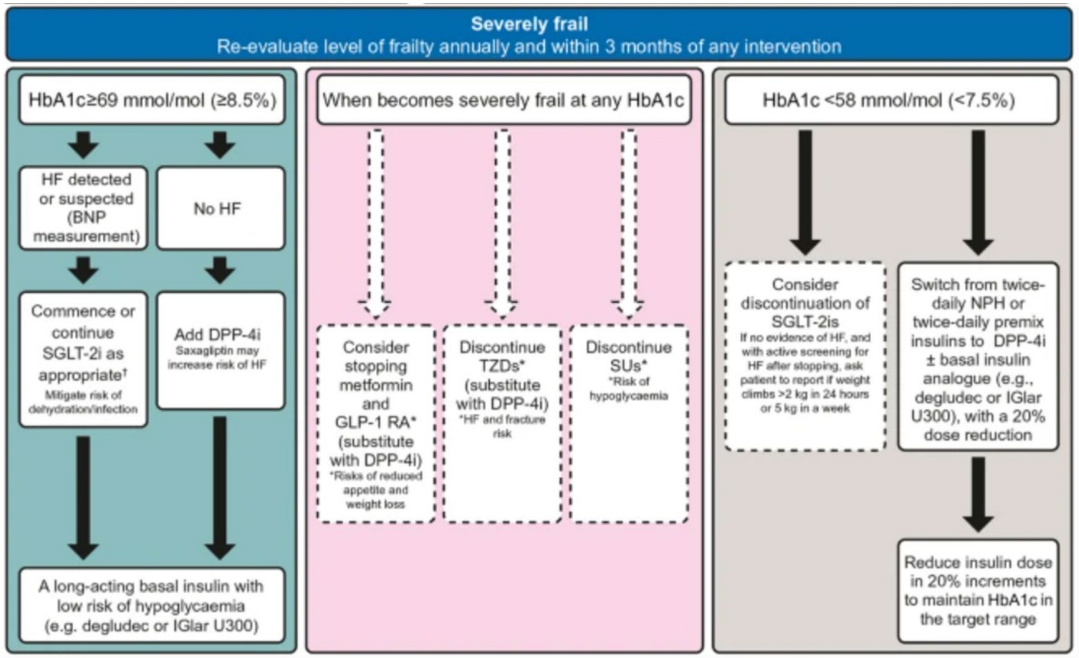

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REVIEW

Diabetes and Frailty: An Expert Consensus Statement on the Management of Older Adults with Type 2 Diabetes

W. David Strain · Su Down · Pam Brown · Amar Puttanna · Alan Sinclair

Consequences of Diabetes in Older Adults

- Higher rates of premature death
- Functional disability
- Accelerated muscle loss
- Coexisting illnesses : hypertension, coronary heart disease, and stroke

Higher Risk of Geriatric syndromes

- Polypharmacy
- Cognitive impairment
- Depression
- Urinary incontinence
- Injurious falls
- Persistent pain
- Frailty

Mairead

- **78 Yo lady Retired shopkeeper four children and two dogs**
- **Independent in ADL's , handles the family bills , likes to cook Sunday lunch for her family and enjoys walking her dogs in the woods near her house.**
- **Very concerned about talk of the Late Late show being cancelled .**
- **Hx Type 2 Diabetes + Osteoarthritis**
- **Diabetes dx 7 years ago no renal impairment / complications of diabetes , retinal screen and foot check up to date.**
- **On metformin 1gram BD , Diamicron 30mg daily and Pioglitazone 15mg daily for her diabetes .**
- **NSAIDS for osteoarthritis**
- **Hba1c 46**
- **EGFR 80 Urine ACR normal , BP 138/80**

What are Maireads targets?

HBA1C

BLOOD PRESSURE

STATIN ?

Coexisting chronic illness*

Cognitive status

Functional status

*Conditions serious enough

to require medications or lifestyle management e.g. arthritis, cancer, heart failure, depression, emphysema

falls, hypertension, incontinence, stage 3 or worse chronic kidney disease, myocardial infarction, and stroke.

Multiple = at least three, but many patients may have five or more

Table 13.1—Framework for considering treatment goals for glycemia, blood pressure, and dyslipidemia in older adults with diabetes

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Mairead results
Hba1c – 46

BP – 138/80

LDL – 3.8

BNP – Normal

Pre prandial glucose – 4.1 – 6 (has occasionally felt unwell , sweaty and dizzy , which resolved with eating but did not think to check her sugars)

Metformin	Sulphonylurea (Diamicron)	Pioglitazone
Reduction in appetite EGFR Sick Day Rules B12 monitoring	Hypoglycaemia risk Requires monitoring of blood sugars Can cause weight gain	Not prone to causing hypoglycaemia Risk of inducing heart failure in the elderly Concerns about the possible association with fracture risk and bladder cancer Pioglitazone may lead to weight gain

Screening for Geriatric syndromes

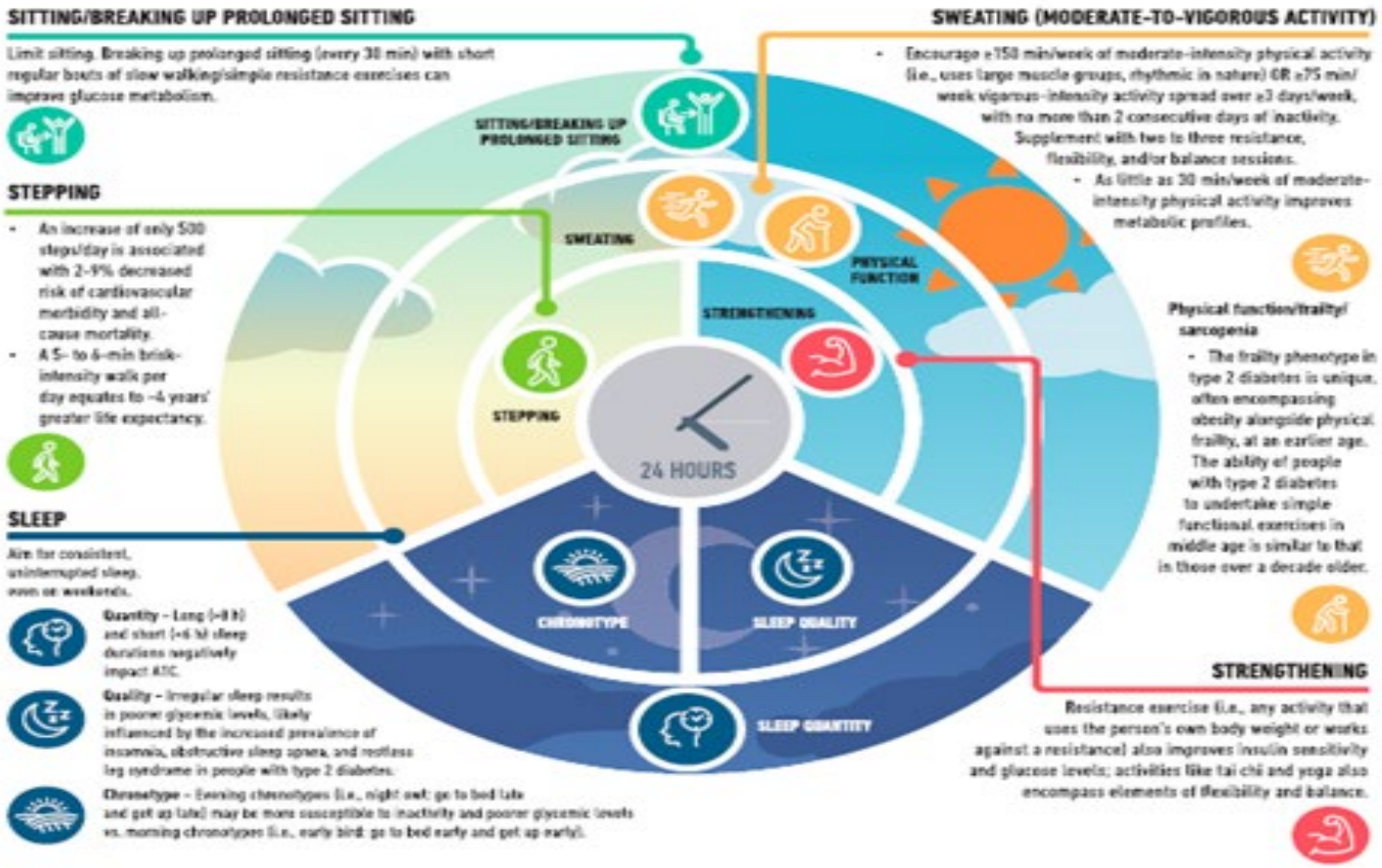
Polypharmacy
Cognitive impairment
Depression
Urinary incontinence
Injurious falls
Persistent pain
Frailty

- Chart review
- Mairead had attended with low mood following the death of her sister and the deterioration in health of her friend Maire who has been admitted to a nursing home.
- She worries about becoming and burden on her family in the future and misses the social interactions she used to have since the pandemic

Plan for Maire

- Stop diamicron and pioglitazone
- Recheck hba1c 3/12 and consider whether to reduce metformin
- Happy with metformin , appetite normal and fbc normal.
- Add ramipril 2.5mg daily
- Add statin
- Referral to local living well program , signposted to HSE Exercise in older adults page
- Encouraged to consider local active retirement group
- Given local resources for online and face to face psychological interventions

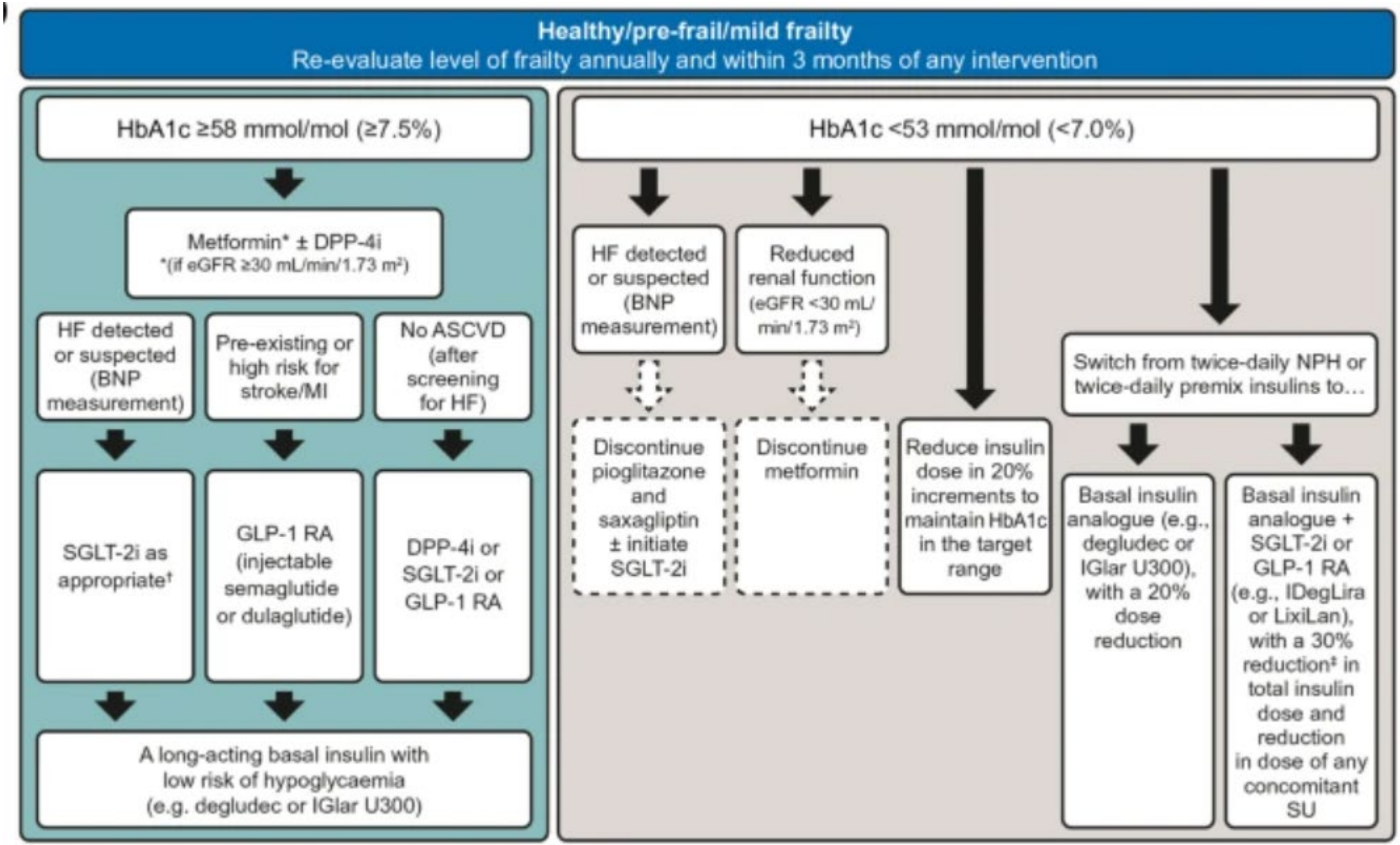
IMPORTANCE OF 24-HOUR PHYSICAL BEHAVIORS FOR TYPE 2 DIABETES



	Glucose/insulin	Blood pressure	A1C	Lipids	Physical function	Depression	Quality of life
SITTING/BREAKING UP PROLONGED SITTING	↓	↓	↓	↓	↑	↓	↑
STEPPING	↓	↓	↓	↓	↑	↓	↑
SWEATING (MODERATE-TO-VIGOROUS ACTIVITY)	↓	↓	↓	↓	↑	↓	↑
STRENGTHENING	↓	↓	↓	↓	↑	↓	↑
ADEQUATE SLEEP DURATION	↓	↓	↓	↓	●	↓	↑
GOOD SLEEP QUALITY	↓	↓	↓	↓	●	↓	↑
CHRONOTYPE/CONSISTENT TIMING	↓	●	↓	●	●	↓	●

IMPACT OF PHYSICAL BEHAVIORS ON CARDIOMETABOLIC HEALTH IN PEOPLE WITH TYPE 2 DIABETES

↑ Higher levels/improvement (physical function, quality of life); ↓ Lower levels/improvement (glucose/insulin, blood pressure, A1C, lipids, depression); ● no data available;
↑ Green arrows = strong evidence; ↑ Yellow arrows = medium-strength evidence; ↑ Red arrows = limited evidence.


Healthy/pre-frail/mild frailty
Re-evaluate level of frailty annually and within 3 months of any intervention
HbA1c ≥58 mmol/mol (≥7.5%)
Metformin* ± DPP-4i
*(if eGFR ≥30 mL/min/1.73 m²)
HF detected or suspected (BNP measurement)
Pre-existing or high risk for stroke/MI
No ASCVD (after screening for HF)
SGLT-2i as appropriate†
GLP-1 RA (injectable semaglutide or dulaglutide)
DPP-4i or SGLT-2i or GLP-1 RA
A long-acting basal insulin with low risk of hypoglycaemia (e.g. degludec or IGlar U300)
HbA1c <53 mmol/mol (<7.0%)
HF detected or suspected (BNP measurement)
Reduced renal function (eGFR <30 mL/min/1.73 m²)
Discontinue pioglitazone and saxagliptin ± initiate SGLT-2i
Discontinue metformin
Reduce insulin dose in 20% increments to maintain HbA1c in the target range
Switch from twice-daily NPH or twice-daily premix insulins to…
Basal insulin analogue (e.g., degludec or IGlar U300), with a 20% dose reduction
Basal insulin analogue + SGLT-2i or GLP-1 RA (e.g., IDegLira or LixiLan), with a 30% reduction‡ in total insulin dose and reduction in dose of any concomitant SU

Hypoglycaemia

- Avoidance of hypoglycaemia is of paramount importance in the elderly/frail
- Increased risk of experiencing hypoglycaemia
- Consequences may be more profound
- Loss of the autonomic warning symptoms of hypoglycaemia (tremor, sweating, palpitations and nausea)
- Danger is of progression to very low blood glucose levels and the more serious problem of neuroglycopaenia (confusion, behavioural change, speech difficulty, blurred vision, drowsiness and, ultimately, convulsions and coma

Mahati

- 76 yo lady retired nurse. Knows Mairead through their friend Maire , who she worked as a nurse alongside.
- From Kerala in India
- She has 3 son’s who are very supportive and lives in a bungalow.
- What do we need to know about Mahati ??

What do we need to know about Mahati?

CO MORBIDITIES

COGNITIVE STATUS

FUNCTIONAL STATUS

Co morbities

Type 2 Diabetes diagnosed 10 years ago
Atrial Fibrillation
Prior Tia
Osteoarthritis
Over active bladder
Prior right knee replacement
Egfr 62 ,
BMI 28
Undergoing workup for SOB . BNP 356 .
Echo awaited

Cognitive status

Attended last year worried about her memory

Occasionally forgets names and needs lists to ensure she does all of her daily tasks .

MMSE 28/30.

Enduring Power of Attorney in place

Functional status

ADLS – Independent washing , dressing , on flat even ground does not use any walking aids but uses a stick on uneven ground

Had 1 fall this year

Her son and daughter in law help with shopping and bills but no red flags incidences

What are Mahati’s targets

HBA1C

BLOOD PRESSURE

STATIN ?

Patient characteristics/ health status	Rationale	Reasonable A1C goal‡	Fasting or preprandial glucose	Bedtime glucose	Blood pressure	Lipids
functional status)						
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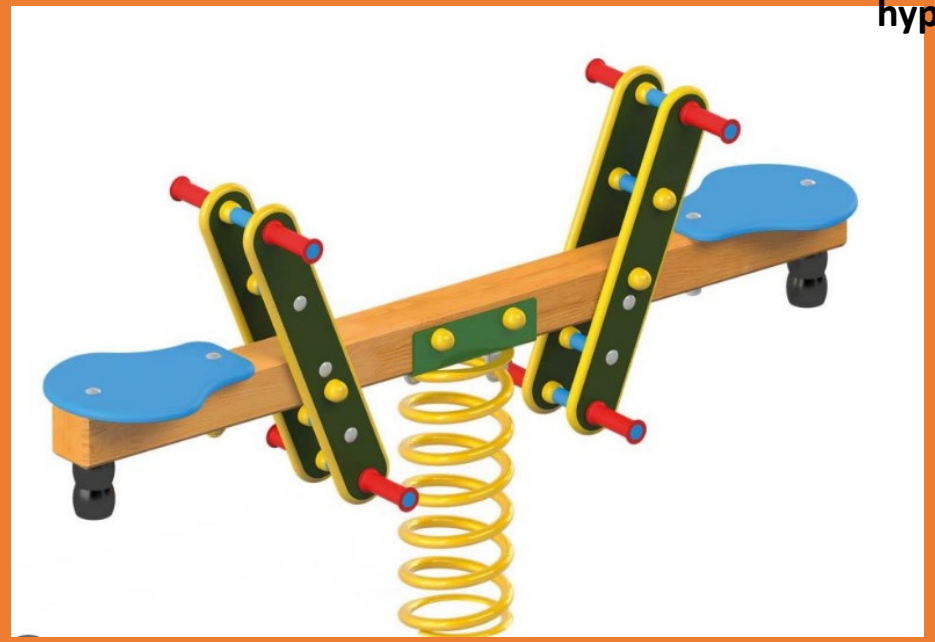
Medications	Results
Metformin 1gram BD Linagliptin 5mg od po Frusemide 40mg od po Ramipril 5mg od po Atorvastatin 20mg od po Apixiban 5mg bd po Bisoprolol 2.5mg od po Arcoxia 60mg od po Paracetamol 1gram qds po / prn Mirabegron	FBC – normal U/E – Egfr 62 LFT – NAD Hba1c 70 Lipids – LDL 1.4 BNP – 356 Urine ACR NAD BP 123/81

What should we do for Mahatis Diabetes ?

Patients are less likely to benefit from reducing the risk of microvascular complications.

In addition, these patients are more likely to suffer serious adverse effects of therapeutics, such as hypoglycaemia

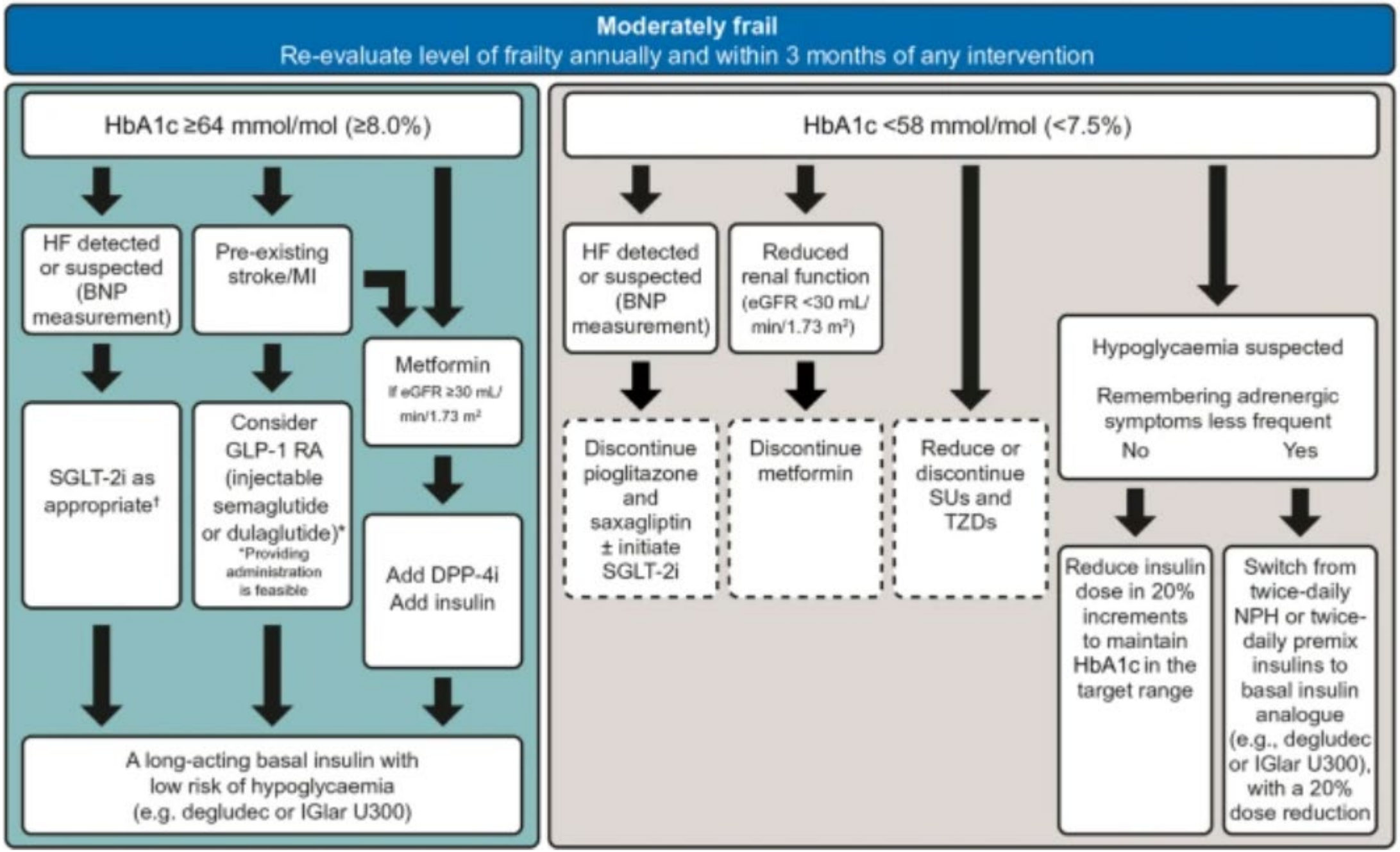


Poorly controlled diabetes may be subject to acute complications of diabetes, including dehydration, poor wound healing, and hyperglycaemic hyperosmolar coma.

CONTROL TOO LOOSE

CONTROL TOO TIGHT

Greater reductions in morbidity and mortality are likely to result from a clinical focus on comprehensive cardiovascular risk factor modification.


Moderately frail
Re-evaluate level of frailty annually and within 3 months of any intervention
HbA1c ≥64 mmol/mol (≥8.0%)
HF detected or suspected (BNP measurement)
Pre-existing stroke/MI
Metformin
If eGFR ≥30 mL/min/1.73 m²
SGLT-2i as appropriate†
Consider GLP-1 RA (injectable semaglutide or dulaglutide)*
*Providing administration is feasible
Add DPP-4i
Add insulin
A long-acting basal insulin with low risk of hypoglycaemia (e.g. degludec or IGlar U300)
HbA1c <58 mmol/mol (<7.5%)
HF detected or suspected (BNP measurement)
Reduced renal function (eGFR <30 mL/min/1.73 m²)
Discontinue pioglitazone and saxagliptin ± initiate SGLT-2i
Discontinue metformin
Reduce or discontinue SUs and TZDs
Hypoglycaemia suspected
Remembering adrenergic symptoms less frequent
No
Yes
Reduce insulin dose in 20% increments to maintain HbA1c in the target range
Switch from twice-daily NPH or twice-daily premix insulins to basal insulin analogue (e.g., degludec or IGlar U300), with a 20% dose reduction

Can we prescribe SGLT2 inhibitors in older adults ?

PRO'S

Once daily oral medication = convenient.

In older patients with ASCVD – added benefits

In older patients with HF – Added benefits including reduced hospitalisation for heart failure

Slows progression in CKD

Potent glucose lowering potential if this is what is needed

CON'S
Mycotic genital infection
Rare risk of fourniers gangrene
Hypotension and hypovolaemua (address mahatis loop diuretic)
Polyuria
Risk of euglycaemic DKA

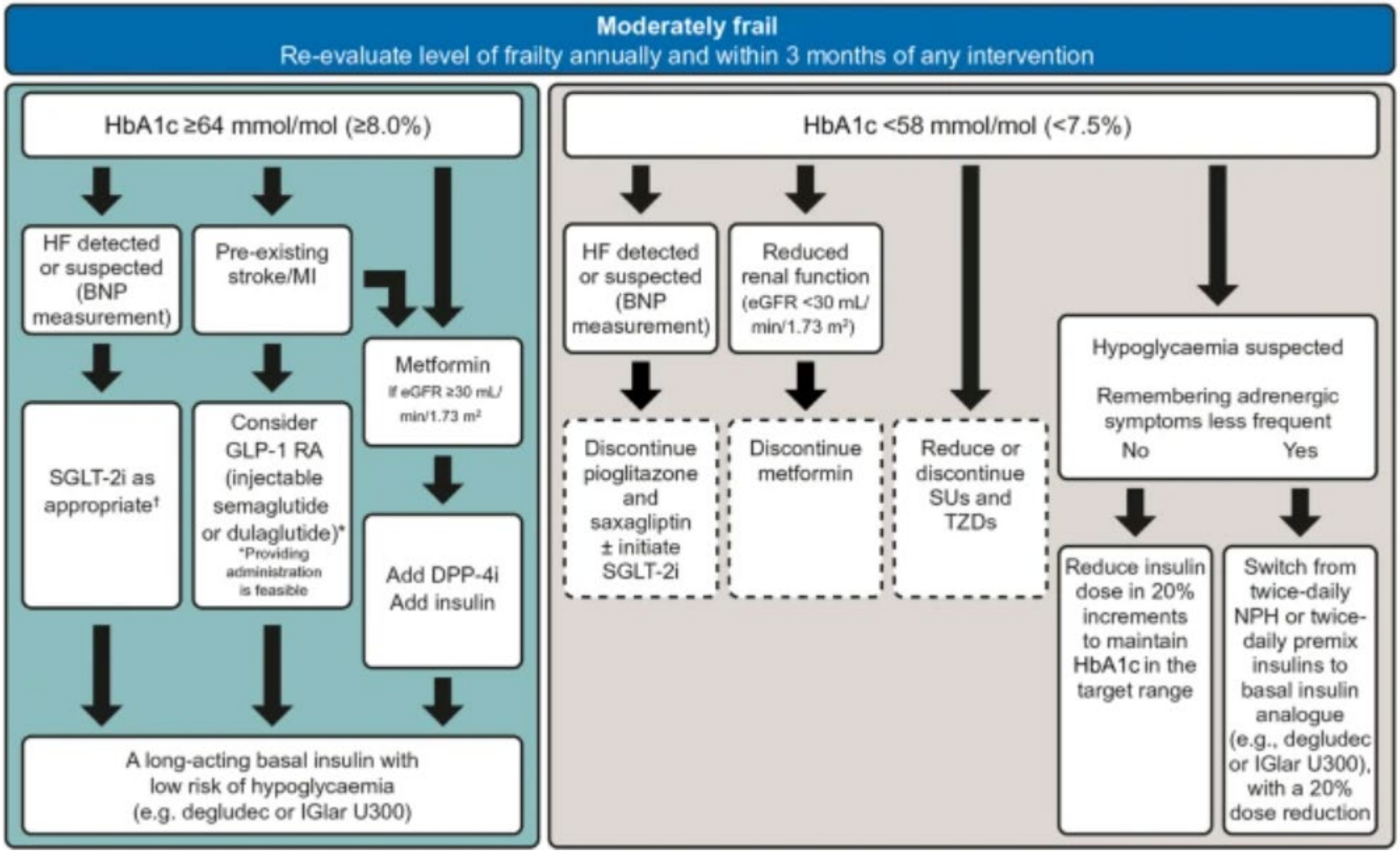
https://diabetesonthenet.com/wp-content/uploads/pdf/dotn024ae8fb1b78500b7bc752b98e9b6d92.pdf

Sick day rules

General advice for managing diabetes during intercurrent illness

S (Sugar)	• Blood glucose levels can rise during illness even if the person is not eating • Advise to increase blood glucose monitoring if the person has access to it • Diabetes medications (sulfonylureas and insulin doses) may need to be increased temporarily during illness to manage these raised glucose levels
I (Insulin)	• **NEVER** stop insulin or oral diabetes medications* • Insulin doses may need to be increased during illness, especially if ketones are present • Specific advice for people on insulin therapy is presented overleaf
C (Carbohydrate)	• Ensure the person maintains hydration and carbohydrate intake • If the person is not able to eat or is vomiting, advise to replace meals with sugary fluids • If blood glucose levels are high, maintain fluid intake with sugar-free fluids • If blood glucose levels are low, encourage regular intake of sugary fluids
K (Ketones)	• In type 1 diabetes, advise to check for ketones every 4–6 hours. If present, check every 2 hours • Give **extra rapid-acting insulin doses** (in addition to regular doses) based on total daily insulin dose if ketones are present – see insulin algorithm overleaf • Advise to drink plenty of water to maintain hydration and flush through ketones

*Metformin and SGLT2 inhibitors may need to be temporarily stopped if at risk of dehydration (see SADMAN rules below.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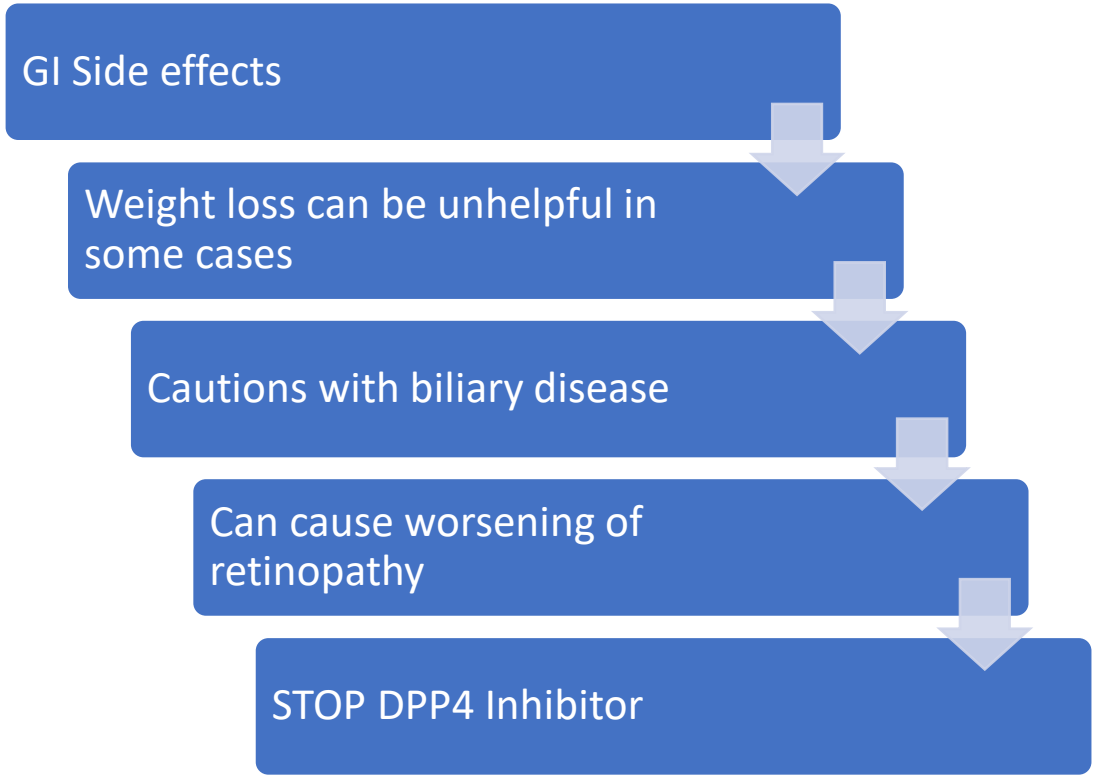
Reduce insulin dose in 20% increments to maintain HbA1c in the target range
Switch from twice-daily NPH or twice-daily premix insulins to basal insulin analogue (e.g., degludec or IGlar U300), with a 20% dose reduction

Can we prescribe a GLP1 receptor agonist for Mahati??

PROS

- GLP-1 receptor agonists may, in the right context, be useful agents in the older person, particularly where obesity is present.
- Once-weekly injectable preparations could be advantageous, especially if there is a requirement for another person to administer treatment.
- Useful in renal impairment
- The GLP-1 RAs achieve impressive improvements in glycaemic control together with weight loss
- Can provide cardiovascular protection
- Possibly renoprotection, and can be used safely in chronic kidney disease down to low eGFR values.

CONS



What about DPP4 Inhibitors ?

Commonly prescribed and generally well tolerated

Less potent than other groups

Mahati's management plan

- Add SGLT2 Inhibitor with proven cardiovascular benefit
- Trial off frusemide
- Refer to community hub cardiology to request echocardiography
- Review 1/12 to check for side effects of above changes including BP , any symptoms HF.
- Referral to public health nurse and physiotherapy to assess gait and for walking aids after fall.
- Online diabetes education program 'Diabetes SMART' for Mahati to revise with her family. Consider attendance at ' living well' program .
- Signposted to HSE Exercise in Older adults and referral to Exwell

Living Well programme

What is the Living Well Programme?

About ExWell Medical

DISCOVER DIABETES

DISCOVER stands for Diabetes Insights and Self Care Options via Education and Reflection. It's a free course for people with Type 2 diabetes.

DISCOVER courses will help you manage the changes that type 2 diabetes brings to your life. They offer the opportunity to meet and share experiences with others.

DISCOVER courses are run over 4 weeks. Each session is 2.5 hours.

You will be invited to attend a follow-up session at 6 months and 12 months.

Chest stretch

This stretch is good for posture.

1. Sit upright and away from the back of the chair. Pull your shoulders back and down. Extend your arms out to the side.
2. Gently push your chest forward and up until you feel a stretch across your chest.

Indoor exercises for older people

Anyone can get active, it's easy to start and it's never too late. Anything that gets you moving is physical activity and it benefits you whatever your age. Get motivated to improve your fitness.

It might be hard to get motivated, especially if it's cold and raining outside. But, you can exercise and get active anywhere — at home or outside in your garden.

Screening for Geriatric syndromes

Polypharmacy
Cognitive impairment
Depression
Urinary incontinence
Injurious falls
Persistent pain
Frailty

- Mahati has polypharmacy .
- She has established mild cognitive impairment and is on the waiting list for memory clinic and has EPA in place.
- She has had 1 fall this year resulting in soft tissue injury but no fracture.
- She does have pain due to her arthritis and her family would report that she seems ‘frail’

Neurocognitive dysfunction in Diabetes

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Poor glycaemic control is associated with a decline in cognitive function , and longer duration of diabetes is associated with worsening cognitive function.

People with diabetes have higher incidences of all cause dementia, Alzheimer disease, and vascular dementia than people with normal glucose tolerance

Pilot studies in patients with mild cognitive impairment evaluating the potential benefits of intranasal insulin therapy and metformin therapy provide insights for future clinical trials and mechanistic studies

Annual screening for cognitive impairment – is this possible ???

Mini-Cog©

Instructions for Administration & Scoring

ID:_____ Date: _____

Step 1: Three Word Registration

Look directly at person and say, "Please listen carefully. I am going to say three words that I want you to repeat back to me now and try to remember. The words are [select a list of words from the versions below]. Please say them for me now." If the person is unable to repeat the words after three attempts, move on to Step 2 (clock drawing).

The following and other word lists have been used in one or more clinical studies.[1-3] For repeated administrations, use of an alternative word list is recommended.

Version 1	Version 2	Version 3	Version 4	Version 5	Version 6
Banana	Leader	Village	River	Captain	Daughter
Sunrise	Season	Kitchen	Nation	Garden	Heaven
Chair	Table	Baby	Finger	Picture	Mountain

Step 2: Clock Drawing

Say: "Next, I want you to draw a clock for me. First, put in all of the numbers where they go." When that is completed, say: "Now, set the hands to 10 past 11."

Use preprinted circle (see next page) for this exercise. Repeat instructions as needed as this is not a memory test. Move to Step 3 if the clock is not complete within three minutes.

Step 3: Three Word Recall

Ask the person to recall the three words you stated in Step 1. Say: "What were the three words I asked you to remember?" Record the word list version number and the person's answers below.

Word List Version: _____ Person's Answers: _____ _____ _____

Scoring

Word Recall: _____ (0-3 points)	1 point for each word spontaneously recalled without cueing.
Clock Draw: _____ (0 or 2 points)	Normal clock = 2 points. A normal clock has all numbers placed in the correct sequence and approximately correct position (e.g., 12, 3, 6 and 9 are in anchor positions) with no missing or duplicate numbers. Hands are pointing to the 11 and 2 (11:10). Hand length is not scored. Inability or refusal to draw a clock (abnormal) = 0 points.
Total Score: _____ (0-5 points)	Total score = Word Recall score + Clock Draw score. A cut point of <3 on the Mini-Cog™ has been validated for dementia screening, but many individuals with clinically meaningful cognitive impairment will score higher. When greater sensitivity is desired, a cut point of <4 is recommended as it may indicate a need for further evaluation of cognitive status.

Clinical implications of cognitive impairment

Identifying cognitive impairment early has important implications for diabetes care. The presence of cognitive impairment can make it challenging for clinicians to help their patients reach individualized glycemic, blood pressure, and lipid targets.

Cognitive dysfunction makes it difficult for patients to perform complex self-care tasks, such as monitoring glucose and adjusting insulin doses. It also hinders their ability to appropriately maintain the timing of meals and content of the diet.

When clinicians are managing patients with cognitive dysfunction, it is critical to simplify drug regimens and to facilitate and engage the appropriate support structure to assist the patient in all aspects of care.

Maire

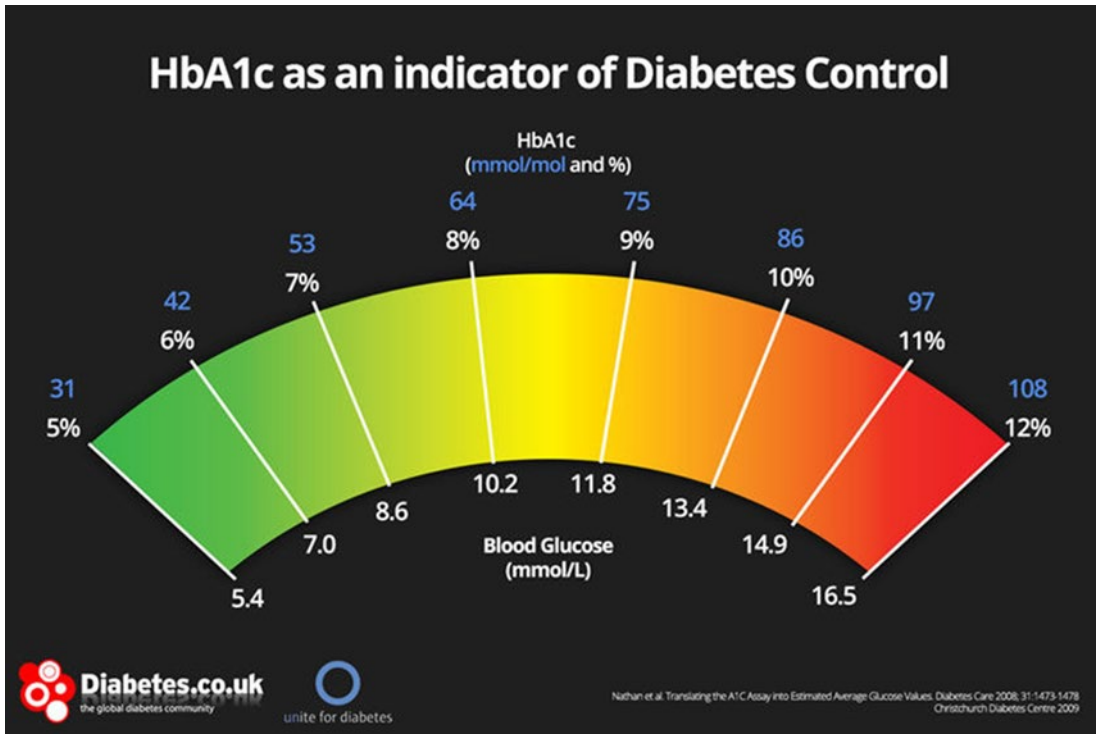
- 82 yo lady hx Type 2 Diabetes
- Recently admitted to a nursing home from hospital after a fall with a hip fracture .
- Had a CVA in hospital with some residual unilateral weakness .
- Widowed since last year, no children . Had a carer at home 3 times a week prior to admission and was supported by neighbours and friends as much as possible.

What do we need to know about Maire?

- .....
- .....
- .....

Co morbidities	Cognitive status	Functional status
Diabetes x 10 years Recent hip fracture Recent CVA with some residual right sided weakness Two x prior TIAs Hypertension , Hyperlipidaemia Renal Impairment EGFR 45 Osteoporosis Osteoarthritis	Diagnosis of Alzheimer's Disease MMSE 21	Mobility - very unsteady on feet , walks with mobility aid but high falls risk and needs some supervision. Assistance with washing and toileting

Patient characteristics/ health status	Rationale	Reasonable A1C goal‡	Fasting or preprandial glucose	Bedtime glucose	Blood pressure	Lipids
Very complex/poor health (LTC or end-stage chronic illnesses** or moderate-to-severe cognitive impairment or two or more ADL impairments)	Limited remaining life expectancy makes benefit uncertain	Avoid reliance on A1C; glucose control decisions should be based on avoiding hypoglycemia and symptomatic hyperglycemia	100–180 mg/dL (5.6–10.0 mmol/L)	110–200 mg/dL (6.1–11.1 mmol/L)	<140/90 mmHg	Consider likelihood of benefit with statin



Hba1c – approx. < 70

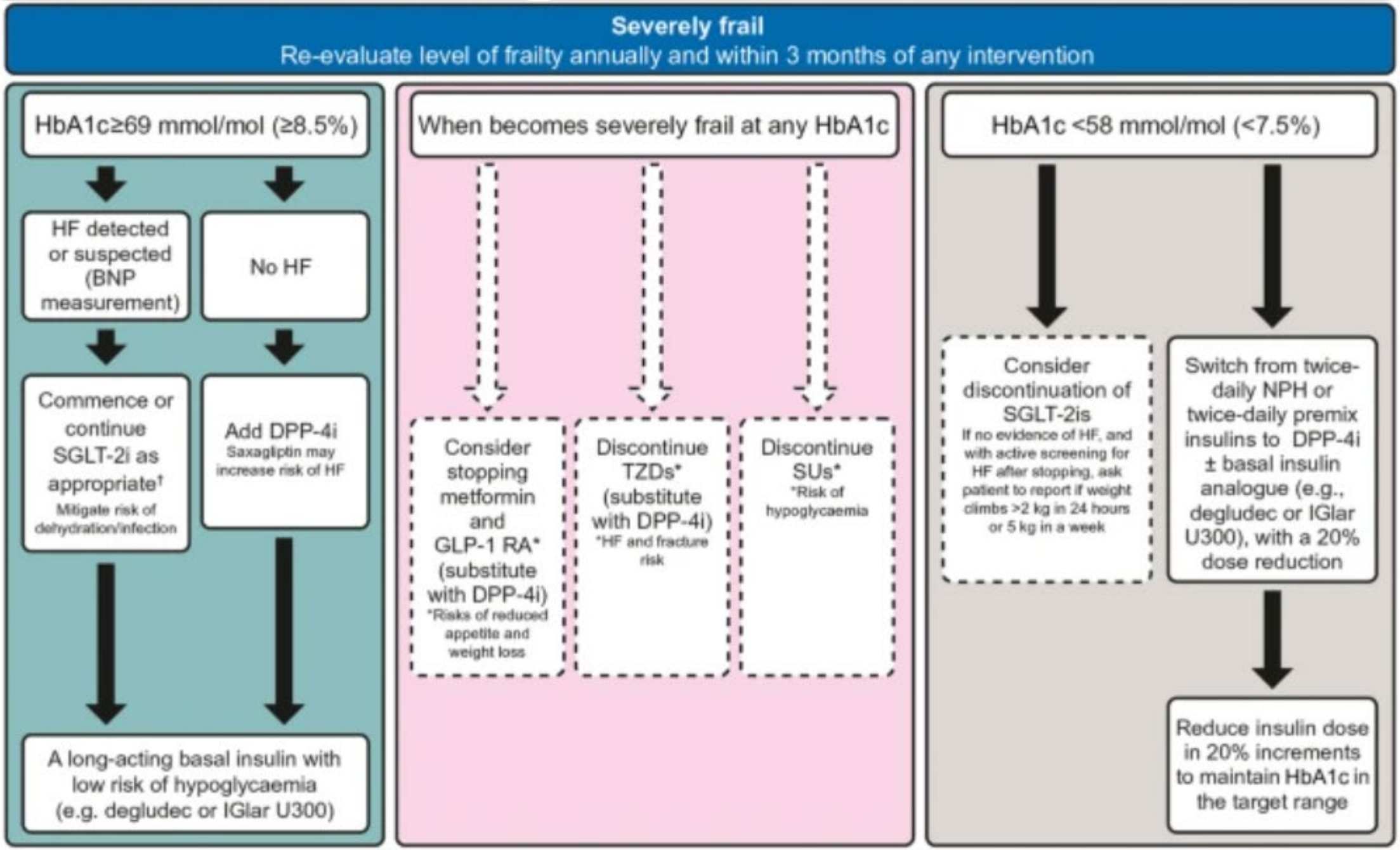
Hba1c less reliable in older frail patients

Priority = avoid hyperglycaemia without risking hypoglycaemia

Medications and results

- Metformin 1gram BD
- Diamicron 90mg mane
- Pioglitazone 30mg daily
- **Linagliptin 5mg mane**
- **Ozempic 1gram once a week**
- Aspirin 75mg daily
- Amlodipine 10mg daily
- Atorvastatin 10mg nocte
- Calcichew D3 Forte
- Denosumb every 6 months
- Topical NSAID gel
- Paracetamol 1 gram TDS / PRN

- FBC – WCC normal , HB 9.1 , PLTs 530
- U/E – EGFr 44
- HBA1C – 56
- Pre-Prandial glucose 5.2 – 7.3 mmol/litre
- BNP 70
- BP 105/70
- BMI 24

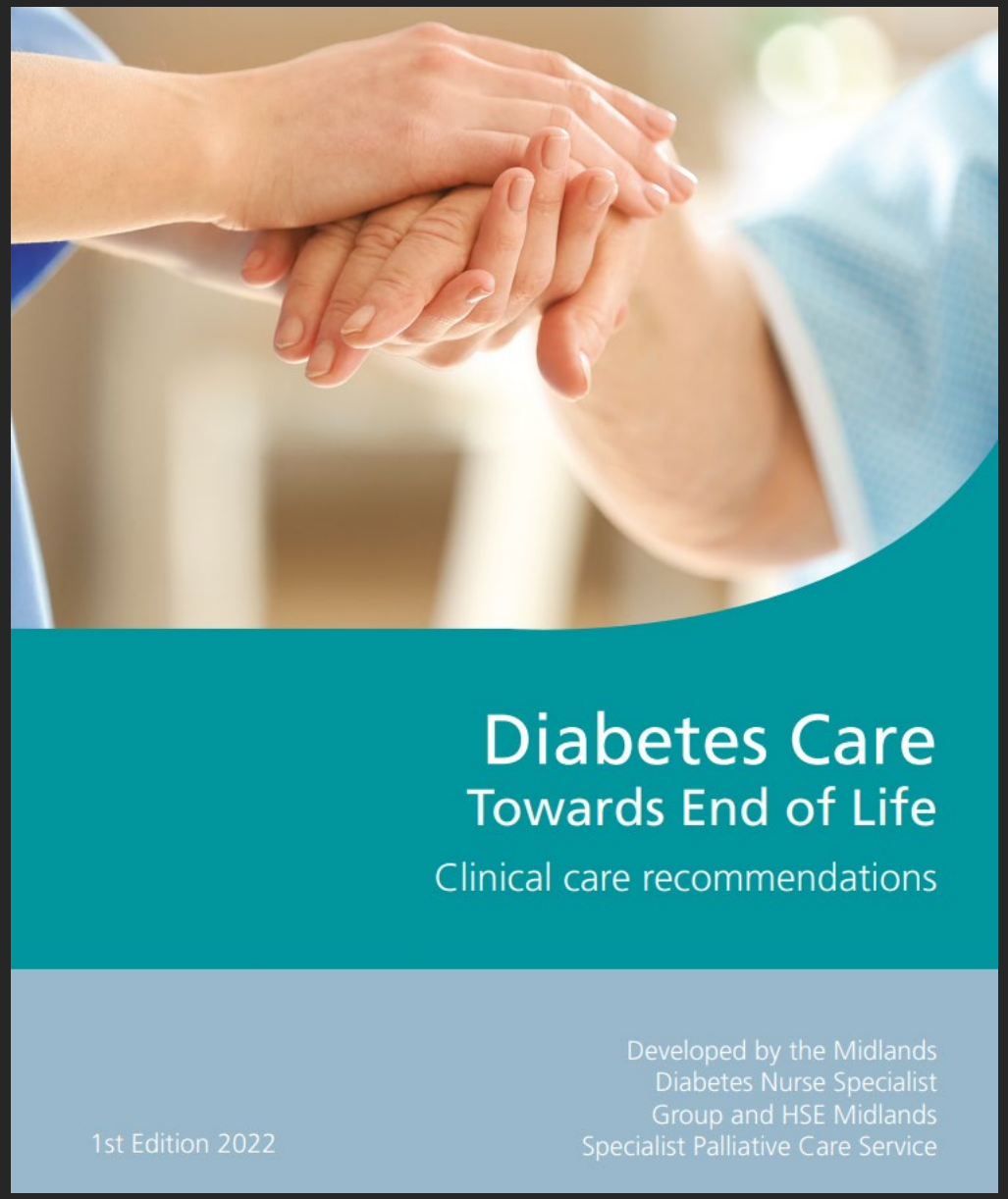

Severely frail
Re-evaluate level of frailty annually and within 3 months of any intervention
HbA1c≥69 mmol/mol (≥8.5%)
HF detected or suspected (BNP measurement)
No HF
Commence or continue SGLT-2i as appropriate†
Mitigate risk of dehydration/infection
Add DPP-4i
Saxagliptin may increase risk of HF
A long-acting basal insulin with low risk of hypoglycaemia (e.g. degludec or IGlar U300)
When becomes severely frail at any HbA1c
Consider stopping metformin and GLP-1 RA* (substitute with DPP-4i)
*Risks of reduced appetite and weight loss
Discontinue TZDs* (substitute with DPP-4i)
*HF and fracture risk
Discontinue SUs*
*Risk of hypoglycaemia
HbA1c <58 mmol/mol (<7.5%)
Consider discontinuation of SGLT-2is
If no evidence of HF, and with active screening for HF after stopping, ask patient to report if weight climbs >2 kg in 24 hours or 5 kg in a week
Switch from twice-daily NPH or twice-daily premix insulins to DPP-4i ± basal insulin analogue (e.g., degludec or IGlar U300), with a 20% dose reduction
Reduce insulin dose in 20% increments to maintain HbA1c in the target range

Plan for Maire

Stop	• Stop Diamicron and Pioglitazone and Ozempic
Reduce	• Reduce metformin to 500mg bd po
Continue	• Continue linagliptin
Reduce	• Reduce amlodipine to 5mg daily
Monitor	• Monitor capillary glucose twice a week with the aim to keep her preprandial glucose between 5.6 and 10

Maire’s cancer diagnosis

- Maire’s nurse then notes that she is getting some PV Bleeding .
- You arrange a pelvic ultrasound which shows an ovarian mass which is likely malignant.
- After consultation with a gynaecology colleague, the feeling is that investigation and management is likely to have a significant hardship for Maire and is unlikely to improve her prognosis which carries uncertainty but may be 6-12 months
- What resources can help guide our management of her diabetes now ?



Individuals are 'approaching the end of life' when they are likely to die within the next 12 - 24 months[3,4]. This includes individuals whose death is imminent (expected within a few hours or days) and those with:

Towards the end of life the focus shifts from prevention of long-term complications associated with diabetes to ensuring that the symptoms of high and low blood glucose levels are controlled and minimised. The priorities become avoiding metabolic decompensation and diabetes-related emergencies. All of this should be achieved with the least invasive testing and minimum effective amount of medication.

- https://www.hse.ie/eng/about/who/acute-hospitals-division/hospital-groups/dublin-midlands-hospital-group/news/diabetes-care-towards-end-of-life-clinical-care-recommendations.pdf

Diabetes Care Towards End of Life Clinical Care Recommendations 2021

STAGES TOWARDS THE END OF LIFE

A - Less than 2 years to end of life

Oral hypoglycaemic agents (OHAs)/insulin should be reviewed and targets for blood glucose control reassessed. Anorexia or weight loss may require lower doses of OHAs/insulin.

The use of cardio-protective therapies (e.g. ACE inhibitors, angiotensin-receptor blockers, aspirin, statins) should be reviewed in the light of the diagnosis and the presence of other medical co-morbidities, and dosage reductions (even withdrawal) of some of the therapies considered.

Individuals may experience more gastrointestinal effects from aspirin with poor dietary intake or concurrent steroid use. Individuals on aspirin and steroids should be considered for gastro-intestinal protection with a proton-pump inhibitor or suitable alternative.

B - Months to end of life - unstable / advanced disease

Type 1 diabetes

At this stage the aim is to keep drug interventions to a minimum that will control symptoms.

It is generally simpler for individuals to switch from a multi daily insulin regimen (MDI) to a once or twice daily insulin regimen

When switching from a multi daily insulin regimen it is recommended that the total daily insulin dose be reduced by 20-30%

When switching from a twice daily insulin regimen to a basal insulin it is recommended that total insulin daily dose be reduced by 20-30%[1]

The likelihood of carers being involved in insulin therapy administration increases at this stage and may inform the choice of insulin regimen.

Consultation with the diabetes team is recommended

Type 2 diabetes

At this stage the aim is to keep drug interventions to a minimum that will control symptoms.

Complex treatment regimens should be reviewed especially where individuals are on multiple oral hypoglycaemic agents with or without insulin.

For some individuals a once daily insulin regimen may be preferable to multiple oral hypoglycaemic agents

Some Individuals with Type 2 diabetes may choose to take oral agents only.

The likelihood of carers being involved in medication administration increases at this stage and may inform the choice of medication regimen.

Consultation with the diabetes team is recommended

C - Weeks to end of life - deteriorating condition

Individuals may present or be referred to the diabetes team at this time, in which case all of the changes suggested in ***A (Blue box)*** and ***B (green box)*** should be considered but keeping in mind that there may be little time to get used to a new insulin regimen.

Managing diabetes can be an added stress at an emotional time for individuals and carers.

Relaxing blood glucose targets for control may seem like “giving up” for some, while others may view managing diabetes in addition to their terminal illness as “pointless”.

D - Final days / terminal care - days prognosis

Ideally by this stage diabetes treatment has been minimised so that few changes are needed in the last days of life.

The Flowchart for Diabetes at End of Life (page 16), describes how to manage diabetes in the dying individual.

It can be reassuring for relatives and carers to know that this additional plan of care is being followed and that the diabetes is being managed differently rather than being “ignored”.

The aim of the flowchart is to minimise symptoms of diabetes and keep invasive testing to a minimum.

What next ?

- Stop metformin
- Stop statin
- Continue linagliptin and aspirin
- Send referral to the local diabetes team and palliative care teams.

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8-10 weeks pass and Maire remains stable

Glucose targets discussed with the diabetes team and loosened from 6mmol/l – 15mmol/l to avoid symptoms of hypo/hyperglycaemia

Type 2 diabetes

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For some individuals a once daily insulin regimen may be preferable to multiple oral hypoglycaemic agents

Some Individuals with Type 2 diabetes may choose to take oral agents only.

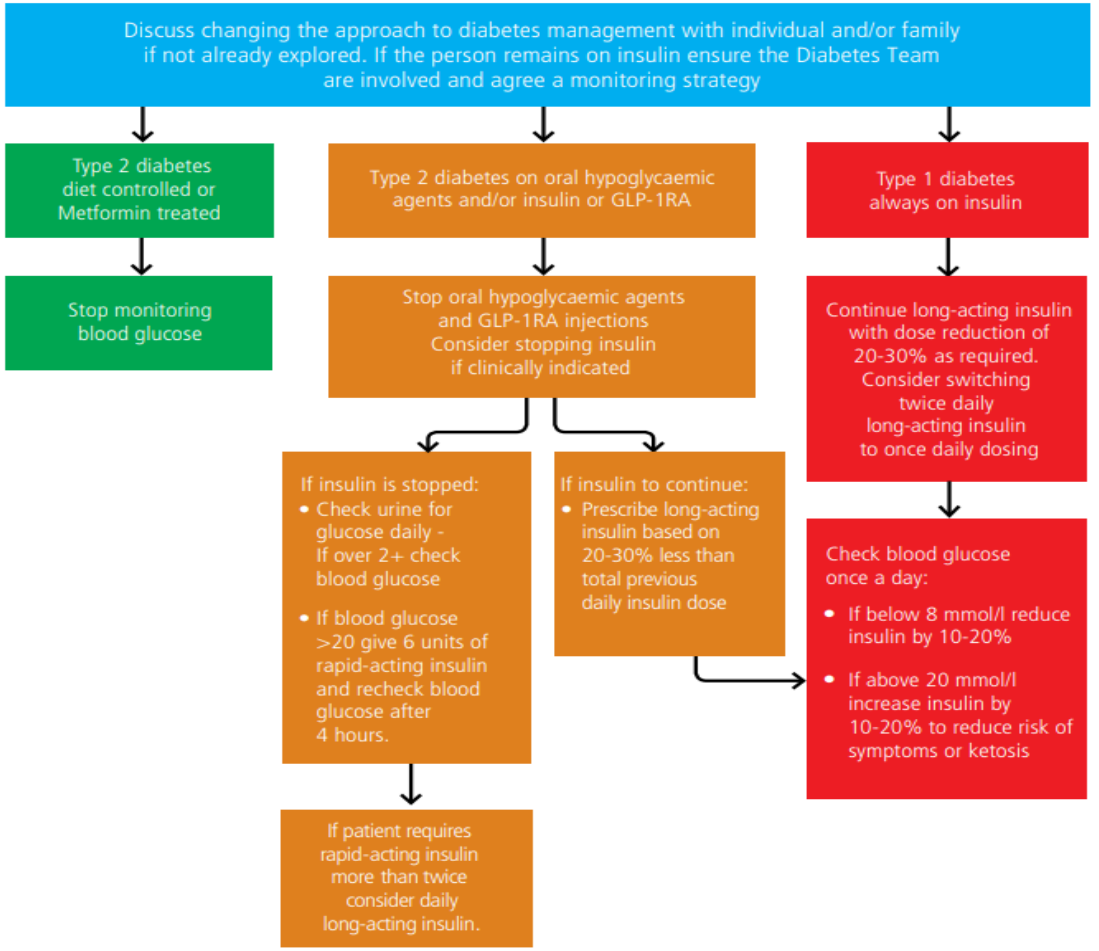
The likelihood of carers being involved in medication administration increases at this stage and may inform the choice of medication regimen.

Consultation with the diabetes team is recommended

- Maire deteriorates , loses weight , po intake reduces , is sleeping more and is experiencing some discomfort
- You feel she has entered the terminal phase .
- You stop her aspirin , calcichew , metformin and linagliptin and prescribe her palliative care medications
- You consult with the palliative care and diabetes teams and come up with some changes to her plan

Plan for Maires Diabetes during the terminal phase	
Monitoring of glucose	• Urine to be checked for glucose daily . • If > 2+ glucose check sugars • If symptoms of hypo/hyperglycaemia check blood glucose
Treatment of glucose	• No regular diabetes medications • If blood glucose > 20 give 6 rapid acting insulin and recheck blood glucose after 4 hours. • If patient needs > 2 doses of rapid acting insulin daily consider daily long acting insulin

FLOW CHART FOR DIABETES CARE AT END OF LIFE[1]



Points to consider

- Keep blood glucose testing to a minimum
- It can be difficult to identify symptoms of hypoglycaemia or hyperglycaemia at the end of life
- Test blood glucose only if the individual is symptomatic or it is clinically indicated (see flow chart)
- Flash glucose monitoring may be useful to avoid finger prick testing

Conclusion

- Maire passes away peacefully with the care of her nursing home team in consultation with Primary Care Services , Palliative Care and Diabetes Team support.
- She required 6 units of rapid acting insulin on one occasion

Thank you

- Feel comfortable setting targets in older adults with diabetes
- Look at the pro's and cons of different classes of diabetes medications in older adults in particular
- Know where to start when prescribing and deprescribing in this group
- Keep an eye out for the presence of geriatric syndromes in patients with diabetes
- Know what resources are available to us in managing patients with type 2 Diabetes in need of palliative care