



## CLINICAL GUIDELINE

# Diabetes: Guidelines for the Management of Type 2 Diabetes Mellitus

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

<b>Version Number:</b>	2
<b>Does this version include changes to clinical advice:</b>	Yes
<b>Date Approved:</b>	13 <sup>th</sup> March 2019
<b>Date of Next Review:</b>	31 <sup>st</sup> March 2022
<b>Lead Author:</b>	Dr Christopher Smith
<b>Approval Group:</b>	Medicines Utilisation Subcommittee of ADTC

### Important Note:

The Intranet version of this document is the only version that is maintained. Any printed copies should therefore be viewed as 'Uncontrolled' and as such, may not necessarily contain the latest updates and amendments.

## Contents

1. Introduction (3)
2. Diagnosis (4)
3. Lifestyle/Weight Management (4)
4. Stratification (7)
5. Pharmacotherapy Algorithm (8)
6. Subgroup Guidance (9)
7. Drug Classes (10)
8. Diabetes, Prevention and Management of Associated Complications (11)
9. Pregnancy and Type 2 Diabetes (11)
10. References (11)

## Introduction

This updated guideline is written in the context of the latest SIGN update (154)<sup>1</sup> and “Quality prescribing for Diabetes”<sup>2</sup>, whilst incorporating the principles of “Practising Realistic Medicine”<sup>3</sup> and “The Modern Outpatient”<sup>4</sup>. The intention is to support care and support planning by empowering patients to make individualised choices with regard ongoing management plans for their multi-morbidities. In particular we hope to support the increasing use of House of Care<sup>5</sup> models across the health board, with GPs as the expert generalist supporting informed patients to make individualised care plans to manage their co-morbidities.

We aim to comply with the core principles of “The Modern Outpatient:-”<sup>4</sup>

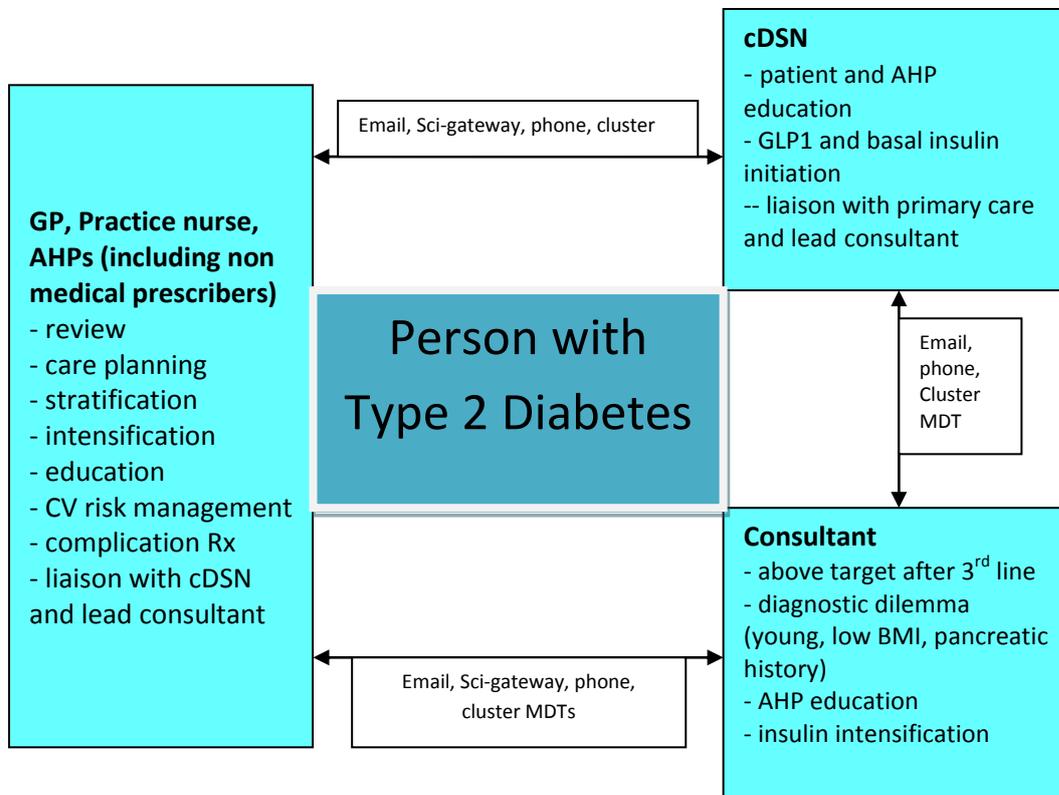
- *Strengthening knowledge exchange and self-management in the community with the patient at the centre,*
- *Accessing decision support, care planning and care services in the community wherever safe and appropriate*
- *Emphasising competency-based roles in secondary care, to focus Consultant resource on more complex patients, and recognising the role of the GP as the ‘expert clinical generalist’ and raising the profile and enhancing the role of the wider multidisciplinary team of community-based practitioners*

And 2) “Practising Realistic Medicine”<sup>3</sup>

- *Empower people and communities to take their rightful place at the centre of decision making.*



Acknowledging the now well established clusters of primary care practices within the health board, we now have a clear vision of how the vast majority of type 2 diabetes care can be offered in the community with easy access to timely specialist support for appropriate patients.



## Diagnosis

At point of diagnosis, people should be directed to relevant approved literature (information leaflets, websites etc) as well as offered referral to local structured education (currently “Conversation Maps”), and consideration of Weight Management referral if appropriate. As per SIGN, consider setting HbA1c target of <48 initially without medical therapy.

If clinical concern (rapid weight loss, significant symptoms, ketosis etc) seek urgent advice from local Diabetes centre or link consultant. Similarly, if concerned over diagnosis (features as above, pancreatic history, low/normal BMI, significant family history, young age), request diagnostic assessment from specialist.

## Lifestyle/Weight Management

People with Type 2 diabetes should be encouraged to achieve and maintain a healthy BMI, as this will help manage the condition and decrease the potential need for escalating medical therapy.

Initial results from the well publicised DiRECT study have shown significant remission rates (HbA1c <48) for overweight patients with type 2 diabetes within 6 years of diagnosis if significant weight loss achieved (86 per cent of people who lost more than 15kg on the programme were in remission after a year, as were 57 per cent of people who lost 10–15kg, and 34 per cent who lost 5–10kg).<sup>6</sup>

When considering whether you should raise the issue of weight with a patient with type 2 diabetes, it is important to take account of their overall physical and emotional state. For example, if they are a heavy smoker or are struggling to cope with the loss of a family member then discussing those issues first may take priority. Behaviour change is most successful when a patient's life circumstances are understood and taken into consideration, a general question to establish the patient's current circumstances can help establish priorities.

### GWMS

Before considering weight management as an option for any patient with type 2 diabetes you should conduct a full medical review. This should include an assessment of any comorbidities that could pose potential risks during weight management, and consideration as to whether any of their current medications could be impacting on their weight. It is important not to make any assumptions about whether weight management is a priority for your patient or not. Even if you have discussed the possibility of weight management before, and at that time it was not a priority, this may not mean that they do not want to engage now. Likewise, do not assume that weight management is of importance to them without first discussing it with the patient.

Access to lifestyle and specialist weight management services including bariatric surgery is via Greater Glasgow and Clyde Weight Management Service. Referral is via Sci-Gateway or paper form (downloaded via link below). There is one form for all patients and the referral hub will triage to the appropriate service. Certain patients with Type 1 and Type 2 diabetes, and also those with heart disease or previous stroke, can also self-refer. It is vital to give a current phone number for the patient, ideally a mobile, as the patient will be phoned to book into a programme once the referral is received. It is best practice to also give the patient the information leaflet describing the service which can be downloaded from the website. Referrers have continued responsibility to monitor conditions such as T1/2 diabetes during weight loss.

[Link to weight management referral](#)

Diabetes specific referral criteria (criteria for other conditions as per link above)

BMI	Condition
<i>Self-referral criteria</i>	
≥25 (22.5*)	Type 2 diabetes
≥30 (27.5*)	Type 1 diabetes
	Heart disease
	Stroke
<i>Health professional referral criteria</i>	
≥25 (22.5*)	Impaired fasting glucose/ Impaired glucose tolerance/ High diabetes risk/ Previous GDM
≥25 (22.5*)	Type 2 diabetes
≥30 (27.5*)	Type 1 diabetes
<i>Bariatric surgery criteria (triaged by service)</i>	
	Type 2 diabetes AND
	BMI 35-55 AND
	Age 18-55 AND
	Diabetes diagnosis <10 years

\* Patients with South Asian/Chinese/middle Eastern Ethnicity have a lower BMI threshold

People with diabetes and BMI >30 can self-refer via dedicated phone line (0141 211 3379 Monday – Friday 8:00am – 4 pm, as per link above).

Triage destination (diabetes related only; for others see link above)

Community Weight Management Service (currently Weight Watchers)		Specialist Weight Management Service	
T2DM	BMI ≥25 (22.5*) <i>(patients who meets surgical criteria will be triaged to specialist service)</i>	T2DM	BMI≥45
T1DM	BMI ≥30 (27.5*)	T1DM	BMI≥45
Impaired fasting glucose/ impaired glucose tolerance/	BMI ≥25 (22.5*)	Potential bariatric surgery patient (as per criteria)	BMI≥35

Exceptional referrals for bariatric surgery

If a GP or Consultant wishes a patient who is outside the current surgery criteria to be considered as an exceptional case for surgery, they can ask for the case to be considered at the Bariatric Exceptional Referrals panel. A full outline of the case should be submitted in writing to:

Mark Dale  
 Clinical Service Manager  
 General Surgery and Breast - North Sector  
 4th Floor Walton Building  
 Glasgow Royal Infirmary  
 Office: 0141 211 5076

### Bariatric Surgery

Patients undergoing bariatric surgery on therapy for type 2 diabetes should have a clear pre- and post- op plan in relation to treatment modification.

Patients using oral medication may need dose reduction of medication, in particular sulphonylurea, pre-op during the calorie restriction phase. Post op, metformin will likely be continued and other non-insulin therapy (including GLP1 agonist) will be withheld. Patients on insulin need to be advised on management of dose as all are encouraged to lose weight during the 3-4 months running up to surgery.

For patients on insulin therapy, pre-op whilst on calorie restriction doses will have to be reduced by at least 10%. Post-op, doses will be reduced by at least 50% and closely monitored. Insulin dosing plans should be confirmed with the relevant link consultant Diabetologist.

## Stratification: Intensification and Conservative/Monitoring

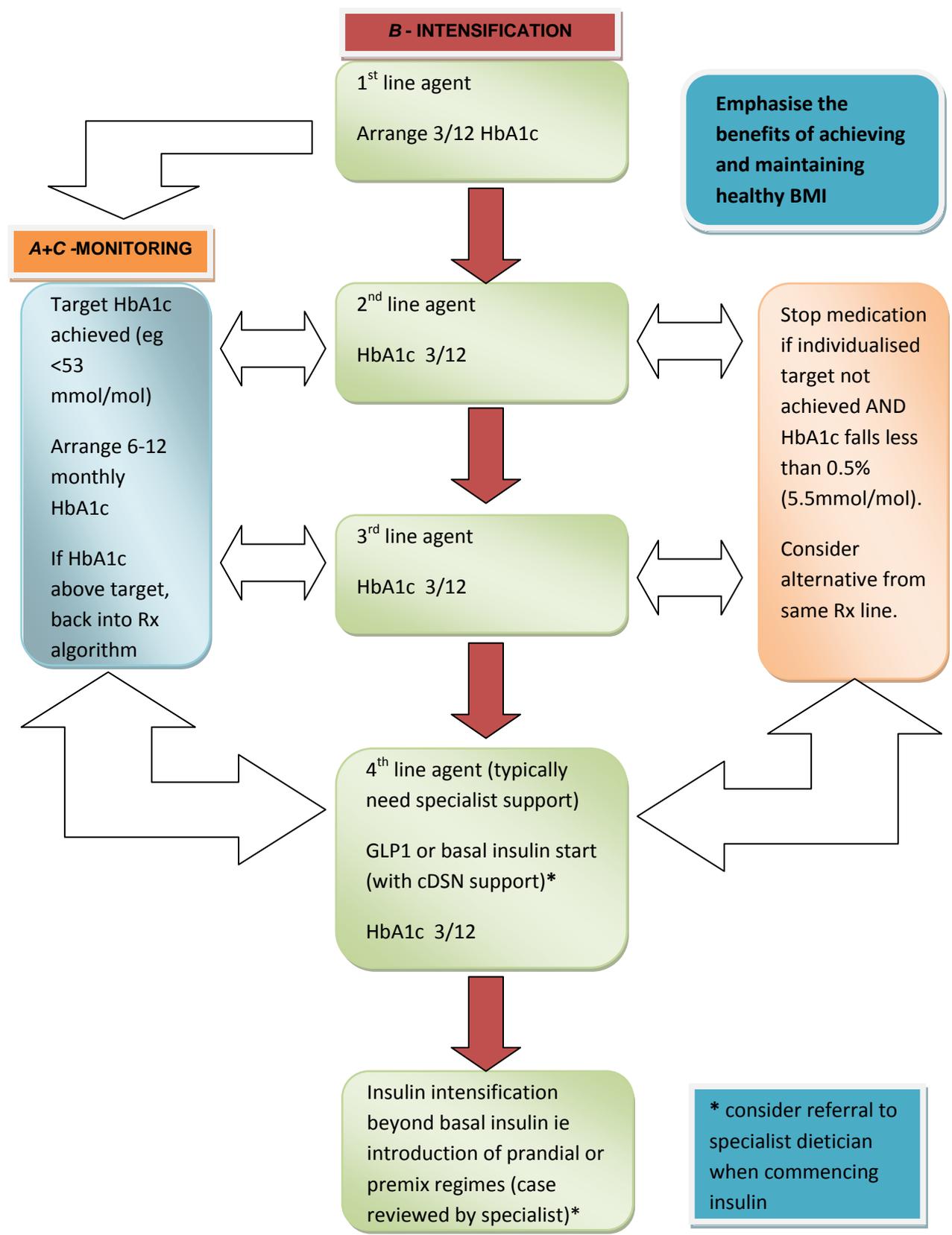
A – Target achieved (national or individualised): **Monitoring**

B – Target not achieved: Active **Intensification**

C – Target not achieved: **Monitoring**

*Intensification complete, drug intolerance/adherence, patient decision*

D – Disengaged from health care



## Pharmacotherapy algorithm (adapted from SIGN 154)

FIRST LINE	METFORMIN	*SU	**SGLT2i (if BMI>30 or CV disease)
<b>Advantages</b>	Weight CV Low hypo risk	Efficacy	Weight loss CV (and BP) Low hypo risk
<b>Cautions/ side effects</b>	GI	Hypos Weight gain Frailty BGM	Diuretics Thrush Ketosis
<b>Contraindications</b>	CKD 4		CKD 3a (initiation) Frailty

\*Alternative to metformin if contraindicated or not tolerated

\*\* Only where metformin is contraindicated or not tolerated and where a sulphonylurea is not appropriate.

SECOND LINE	SGLT2i	SU	DPP4i	Pioglitazone
<b>Advantages</b>	Weight loss CV (and BP) Low hypo risk	Efficacy	Weight Low hypo risk tolerated	Efficacy Low hypo risk
<b>Cautions/ side effects</b>	Diuretics Thrush Ketosis	Hypos Weight gain Frailty BGM	Efficacy CKD (adjustment)	Oedema Central adiposity osteoporosis
<b>Contraindications</b>	CKD 3a (initiation) Frailty		Pancreatic history	CCF Bladder cancer (haematuria)

THIRD LINE	3 <sup>rd</sup> agent from 2 <sup>nd</sup> line	GLP1 RA	O.D. insulin
<b>Advantages</b>	As above	Efficacy Weight loss CV Low hypo risk	Efficacy
<b>Cautions/ side effects</b>	As above	GI Injections	Hypos Weight gain BGM Injections
<b>Contraindications</b>	As above	Pancreatic history CKD 4 (egfr <15 for some)	

FOURTH LINE	Specialist input (cDSN and/or consultant)	If >1 insulin injection required should be offered clinic review until stable

## Subgroup guidance

### Obesity or CV disease

If known CV disease, choose SGLT2i or GLP1 RA with proven CV benefit.

\*Alternative to metformin if contraindicated or not tolerated

<b>FIRST LINE</b>	<b><u>METFORMIN</u></b>	<b>*SU</b>	<b>*SGLT2i (if BMI&gt;30 or CV disease)</b>
-------------------	-------------------------	------------	---

<b>SECOND LINE</b>	<b><u>SGLT2i</u></b>	<b>SU</b>	<b>DPP4i</b>	<b>Pioglitazone</b>
--------------------	----------------------	-----------	--------------	---------------------

<b>THIRD LINE</b>	<b><u>GLP1 RA</u></b>	<b>3<sup>rd</sup> agent from 2<sup>nd</sup> line</b>	<b>O.D. insulin</b>
-------------------	-----------------------	--	---------------------

### Elderly/Frail

Relaxing glycaemic target may be appropriate eg HbA1c 65-75 mmol/mol, and concentrating on treating symptoms whilst minimising risks of potential side effects like hypoglycaemia.

<b>FIRST LINE</b>	<b><u>METFORMIN</u></b>	<b>*SU</b>	<b>*SGLT2i (if BMI&gt;30 and or CV disease)</b>
-------------------	-------------------------	------------	---

<b>SECOND LINE</b>	<b><u>DPP4i</u></b>	<b>SGLT2i</b>	<b>SU</b>	<b>Pioglitazone</b>
--------------------	---------------------	---------------	-----------	---------------------

### CKD

Drug/eGFR (ml/min/1.73 <sup>2</sup> )	>60	45-60	30-44	<30
Metformin			Reduce dose	No
Sulphonylureas			Caution	Caution
Empagliflozin		Reduce dose / don't initiate	No	No
Dapagliflozin		Continue/ don't initiate	No	No
Canagliflozin		Reduce dose / don't initiate	No	No
Sitagliptin		Reduce dose if eGFR <50	Reduce dose	Reduce dose further
Alogliptin		Reduce dose if eGFR <50	Reduce dose	Reduce dose further
Linagliptin				
Pioglitazone				
Liraglutide				Stop <15
Dulaglutide				Stop <15
Exenatide		Caution if eGFR <50	Caution	No
Exenatide MR		Stop <50	No	No
Lixisenatide		Caution if eGFR <50	Caution	No

The table provides guidance please refer to BNF /SPC

## Drug Classes

### Biguanides (Metformin)

Metformin should be considered first line treatment for people with type 2 diabetes. Optimal dose 1g twice a day with meals, titrated from 500mg once a day.. Generally accepted patients will continue with metformin unless not tolerated or contraindicated due to prognostic benefit.

### Sulphonylureas

Sulphonylureas should be considered as first-line agents for people intolerant of metformin, or in whom metformin is contraindicated, and not suitable to consider SGLT2i (CV disease or obesity). Sulphonylureas should be considered as second- and third- line add on therapy in combination with other oral agents. Appropriate advice and access to blood glucose monitoring should be considered, in relation to risk of hypoglycaemia.

### SGLT2 inhibitors

SGLT-2 inhibitors with proven CV benefit (currently empagliflozin<sup>7</sup>, canagliflozin<sup>8</sup>, and dapagliflozin<sup>9</sup>) should be considered as add-on therapy to metformin in people with type 2 diabetes. For those with established CVD or heart failure, these may be considered first line if metformin is not suitable (or contraindicated) and a sulphonylurea is not appropriate.

Patients should be advised of increased risk of genital mycotic infection. Current advice would be to avoid prescribe in combination with loop diuretic, due to the diuretic effect of the medication. Avoid in frail/elderly patients due to potential risk of postural hypotension and/or dehydration. Awareness of association with ketoacidosis.<sup>10</sup>

### DPP4 inhibitors

DPP4 inhibitors should be considered, usually as 2<sup>nd</sup> or 3<sup>rd</sup> line to reduce HbA1c.

### Thiazolidinediones (Pioglitazone)

Pioglitazone should be considered, usually as dual or triple therapy, for lowering HbA1c.

Pioglitazone should not be used in patients with heart failure.

The risk of fracture should be considered during long-term use of pioglitazone.

Patients prescribed pioglitazone should be made aware of the increased risk of peripheral oedema, heart failure, weight gain, bladder cancer and fractures.

### GLP-1 agonists

GLP-1 receptor agonist therapy should be considered as a 3<sup>rd</sup> or 4<sup>th</sup> line agent if BMI >30 and treatment with insulin would otherwise be the next option. Not to be prescribed with DPP4 inhibitors. Generally your CDSN will help with initiation and patient education. In individuals with type 2 diabetes and established CVD, GLP-1 agonists with proven CV benefit (currently liraglutide<sup>11</sup> and semaglutide<sup>12</sup>) should be considered.

### Insulin

Oral metformin therapy should be continued when insulin therapy is initiated to maintain or improve glycaemic control. Consider stopping or reducing sulphonylurea therapy when insulin therapy is initiated. The benefits and risks of continuing other glucose-lowering agents should also be reviewed at this time on an individualised basis. Once-daily bedtime NPH insulin should be used when adding insulin to metformin. Basal analogues 2<sup>nd</sup> line if problems with hypoglycaemia or felt useful if patient requiring 3<sup>rd</sup> party administration. When commencing insulin therapy, bedtime basal insulin should be initiated and the dose titrated against morning (fasting) glucose. If the HbA1c level does not reach target then addition of prandial insulin should be considered.

Note there is a combined insulin degludec and liraglutide product being use by some patients (not achieving target on basal insulin), named Xultophy. This should be initiated under specialist guidance.

## Diabetes, Prevention and Management of Associated Complications

As per following link:

<http://www.staffnet.ggc.scot.nhs.uk/Info%20Centre/PoliciesProcedures/GGCClinicalGuidelines/GGC%20Clinical%20Guidelines%20Electronic%20Resource%20Direct/Diabetes,%20Prevention%20and%20Management%20of%20Associated%20Complications.pdf>

## Pregnancy and Type 2 Diabetes

All women with type 2 diabetes of child bearing age should be offered contraceptive advice and know to plan any pregnancy to optimise outcomes. All diabetes centres offer a pre-pregnancy service and **all women with diabetes should be referred if considering pregnancy**. Potentially teratogenic therapies need stopped, folic acid established, and glycaemia optimised.

## References

- 1) SIGN guideline 154, <https://www.sign.ac.uk/assets/sign154.pdf>
- 2) Quality Prescribing for Diabetes, A Guide for Improvement 2018-2021  
<https://www.therapeutics.scot.nhs.uk/wp-content/uploads/2018/03/Strategy-Diabetes-Quality-Prescribing-for-Diabetes-2018.pdf>
- 3) Practising Realistic Medicine: Chief Medical Officer for Scotland annual report,  
<https://beta.gov.scot/publications/practising-realistic-medicine/>
- 4) The Modern Outpatient: A Collaborative Approach 2017-2020,  
<https://beta.gov.scot/publications/modern-outpatient-collaborative-approach-2017-2020/>
- 5) Scotland's House of Care, <https://houseofcare.wordpress.com/>
- 6) Lean M, Leslie W, Barnes A et al, Primary care-led weight management for remission of type 2 diabetes (DiRECT): an open-label, cluster-randomised trial, Lancet 2018; 391:541-551  
[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(17\)33102-1/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(17)33102-1/fulltext)
- 7) Zinman B, Wanner C, Lachin J et al, Empagliflozin, Cardiovascular Outcomes, and Mortality in Type 2 Diabetes, NEJM 2015; 373:2117-2128 <https://www.nejm.org/doi/full/10.1056/NEJMoa1504720>
- 8) Neal B, Perkovic V, Mahaffey K et al, Canagliflozin and Cardiovascular and Renal Events in Type 2 Diabetes, NEJM 2017; 377:644-657 <https://www.nejm.org/doi/full/10.1056/NEJMoa1611925>
- 9) Wiviott S, Raz I, Bonaca M et al, Dapagliflozin and Cardiovascular Outcomes in Type 2 Diabetes, NEJM 2018  
<https://www.nejm.org/doi/full/10.1056/NEJMoa1812389>
- 10) SGLT2 inhibitors: updated advice on the risk of diabetic ketoacidosis <https://www.gov.uk/drug-safety-update/sglt2-inhibitors-updated-advice-on-the-risk-of-diabetic-ketoacidosis>
- 11) Marso S, Daniels G, Brown-Frandsen K et al, Liraglutide and Cardiovascular Outcomes in Type 2 Diabetes, NEJM 2016; 375:311-322 <https://www.nejm.org/doi/full/10.1056/NEJMoa1603827>
- 12) Marso S, Bain S, Consoli A et al, Semaglutide and Cardiovascular Outcomes in Patients with Type 2 Diabetes, NEJM 2016; 375:1834-1844  
<https://www.nejm.org/doi/full/10.1056/nejmoa1607141>