Diabetes

- Type1

  insulin deficiency. Ketone prone

  Treat with insulin

- Type2

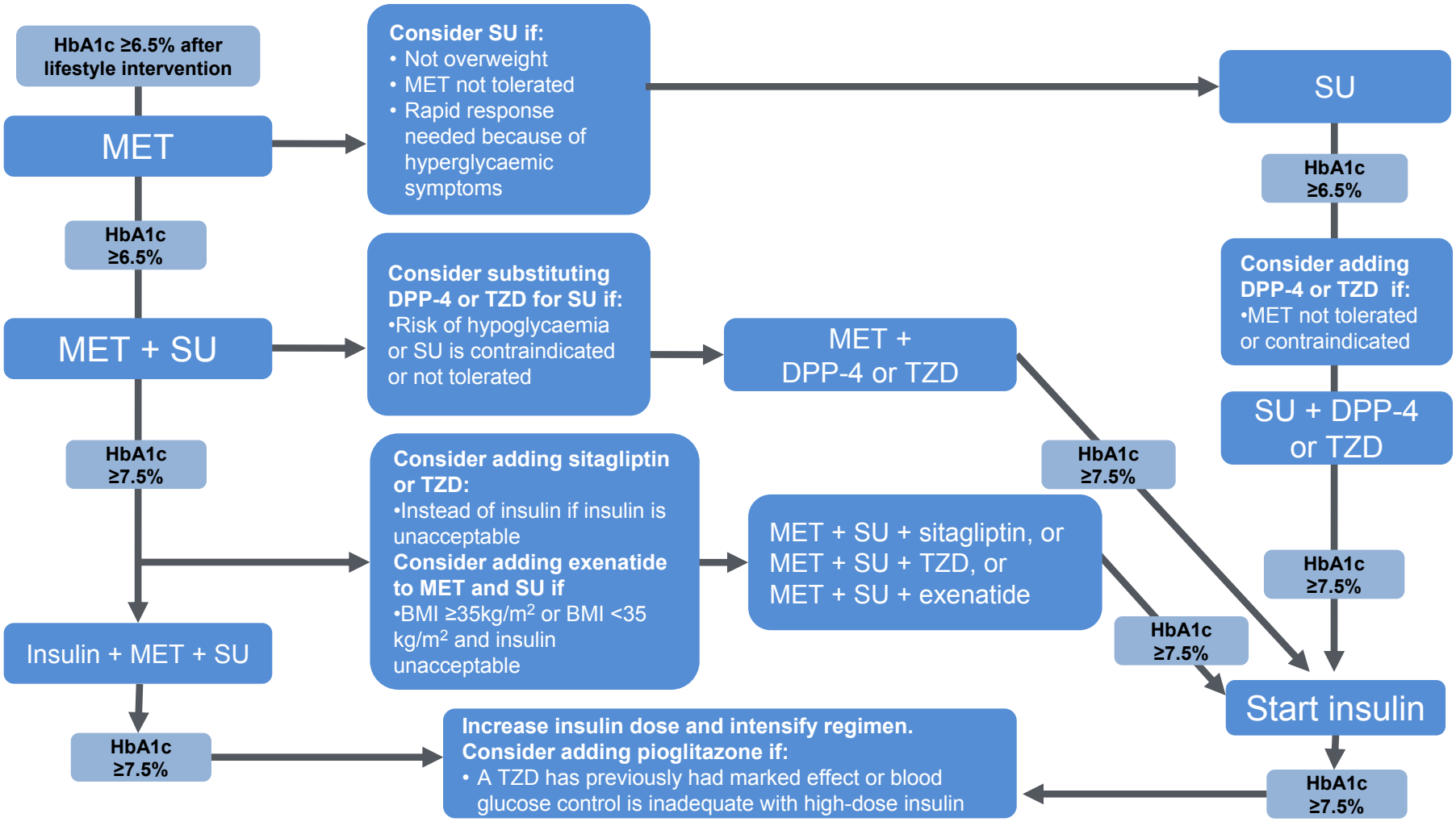
  insulin resistance. Not ketone prone

  Treat with metformin, GLP-1 mimetics

- Type1.5

  type 1 with obesity. Deficiency of insulin plus insulin resistance

National Institute for Health and Clinical Excellence (NICE): T2D treatment algorithm[1]



MET = metformin, SU = sulphonylureas, TZD = thiazolidinedione, DPP-4= dipeptidyl peptidase-4 inhibitor

1. Adapted from: National Institute for Health and Clinical Excellence. Clinical Guideline 87. Type 2 diabetes - newer agents (a partial update of CG66): quick reference guide.

Scottish Intercollegiate Guidelines Network (SIGN): T2D treatment algorithm[1]

1st LINE OPTIONS in addition to lifestyle measures; START ONE OF

Metformin (MET)	**Sulphonylurea* (SU)** • If intolerant to metformin • If weight loss/osmotic symptoms

Review and if not reaching target move to 2nd line

	Usual approach
	Alternative approach
*	**Continue medication if EITHER individualised target achieved OR HbA1c falls >0.5% (5.5 mmol/mol) in 3-6 months**

2nd LINE OPTIONS in addition to lifestyle measures, adherence to medication and dose optimisation; ADD ONE OF

SU*	**Thiazolidinedione*** • If hypos a concern (e.g. driving, occupational hazards, at risk of falls) and if no congestive heart failure	**DPP-4 inhibitor*** • If hypos a concern (e.g. driving, occupational hazards, at risk of falls, or if weight gain a concern

Review and if not reaching target move to 3rd line

3rd LINE OPTIONS in addition to lifestyle measures, adherence to medication and dose optimisation; ADD OR SUBSTITUTE WITH ONE OF

ORAL (continue MET/SU if tolerated)		INJECTABLE (if willing to self inject; continue MET/SU if tolerated)	
Thiazolidinedione* If no congestive heart failure	**DPP-4 inhibitor*** If weight gain a concern	**Insulin* (inject before bed)** • If osmotic symptoms/rising HbA1c; NPH insulin initially • If hypos a concern, use basal analogue • Add prandial insulin with time if required	**GLP-1 agonists*** •If BMI > 30 kg/m^2 •If a desire to lose weight •Usually <10 years from diagnosis

DPP-4= dipeptidyl peptidase-4 inhibitor; GLP-1 = glucagon-like peptide 1

1. Adapted from: Scottish Intercollegiate Guidelines Network. Management of diabetes: a national clinical guideline. March 2010. Prescribers should refer to the British National Formulary (www.bnf.org) and the Scottish Medicines Consortium (www.scottishmedicines.org.uk) for updated guidance on licensed indications, full contraindications and monitoring requirements.

Case Study

- Food Plan - Dietitian with knowledge of ethnic foods
- Reduce fast absorbed sugars- use complex carbohydrates
- FOR OBESE CUT CALORIES ++

Obese Type 2 Diabetic

- Loose weight
  - decrease insulin requirement
  - decrease insulin resistance
- Exercise
  - increases insulin sensitivity
- Dietitian
  - less calories, less CHO

* Food Plan
  - for 3 months unless glucose very high
  - reinforced by dietitian
- Metformin
  - gradually build up dose
  - decreases insulin resistance
- Reinforce food plan

- If you add sulphonylurea or insulin the weight will go up and appetite will be stimulated

Myths about Obesity/Dieting

- I do not eat very much!
  - eat more than need.
  - underestimate what do eat.
  - total calories in that counts
- I eat healthily!
  - maybe but TOO Much. Portion size. Smaller plate
- I can not exercise because of back/heart
  - exercise does not burn many calories
  - can exercise in chair
- I have a slow metabolism
  - Rubbish obese have higher BMR than normal weight
- Its my glands
  - Rubbish if thyroid is ok
  - v.v.v.rare metabolic problems associated with obesity
  - only gland that's wrong is ……

OBESE

- Need to eat less permanently
  -not diet – short term.
  - alter eating habits permanently – food plan/life style
  - difficult – food is pleasurable + social

. Respond to Satiety signals
  -eating is a habit. Stop eating when full. LEAVE FOOD ON PLATE.

. Never tell obese T2D to snack between meals/ have a supper unless they have gone hypo.

. Anticipate exercise and take less medication before it rather than snack to cover it.

. EAT + DRINK LESS

Case Study

- Keep on with Food Plan alone for 3 months (but see them regularly)
- Then add METFORMIN gradually 500mg with main meal for two weeks then 500mg BD etc
- Never liquid metformin use sachets
- Try Metformin SR if bowel intolerant
- If not to target send to NASTY dietitian!

Add a Gliptin

- Sitagliptin 100mg daily
- No weight gain
- Will reduce HbA1c 7-8 mmol/mmol
- Re-emphasize Food Plan
- Check eGFR reduce dose if renal impairment

  eGFR 30-50 50mg

  eGFR <30 25mg

Case Study

- Food Plan
- Metformin
- Sitagliptin

- If still not to target sulphonylurea
  glitazone
  post prandial regulator

*If still not to target – injectable
GLP-1 mimetic
Insulin

Case Study

- If obese
  - strongly consider GLP-1
  - response v variable better if not diagnosed too long
  - may be limited by side effects
  - still needs to follow food plan
  - stop if not helping 3-6 months
  - may need to add in prandial regulator with meals

* Stop gliptin if on GLP-1

Non Obese type 2

- Food Plan –isocaloric – restrict fast absorbed sugars
- Consider sulphonylureas – gliclazide
- Can still use metformin – for insulin resistance
- Can still add in gliptin

- May need basal insulin eventually

OBESE DIABETIC

- Comply with calorie/CHO restriction
- Metformin
- Gliptin
- STOP gliptin and use GLP-1 agonist
- Add sulphonylurea/prandial regulator
- Add basal long acting insulin if fasting glucose is above 6mmol/l
- CAN BE VIRTUALLY UNTREATABLE ESPECIALLY IF NON COMPLIANT TO FOOD PLAN

Patient Blood Glucose Monitoring

HbA1c		Average b. glucose
108	12	19.5
97	11	17.5
86	10	15.5
75	9	13.5
64	8	11.5
53	7	9.5