London Conference | PCDO Society

The young adult with early-onset type 2 diabetes

Rahul Mohan & David Miller | July 2025

This conference was developed by the PCDO Society in conjunction with OmniaMed Communications. The sponsoring companies have had no input into the conference agenda, speaker selection or presentations, with the exception of the symposium sessions, for which the respective sponsoring companies are fully responsible.

Disclaimer/disclosure

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Chair of Diabetes and Technology Task and Finish Group – CGM & HCL Nottingham and Nottinghamshire ICB
Improving Diabetes Steering Committee (IDSC)-member

Sat on Advisory Boards & for providing educational sessions and Travel grants for Conferences/Congress -Novo Nordisk, Abbott, Napp, MSD, Astra Zeneca, Eli Lilly, Janssen, Grunenthal, A Menarini Pharma, Shionogi, Boehringer-Ingelheim, Bayer, Takeda, Internis Pharmaceuticals, Daiichi Sankyo, Flynn Pharma and Leo Pharmaceuticals

Not in receipt of any retainer from any Pharmaceutical Company.

Investment in Pharmaceutical companies-None

David Miller

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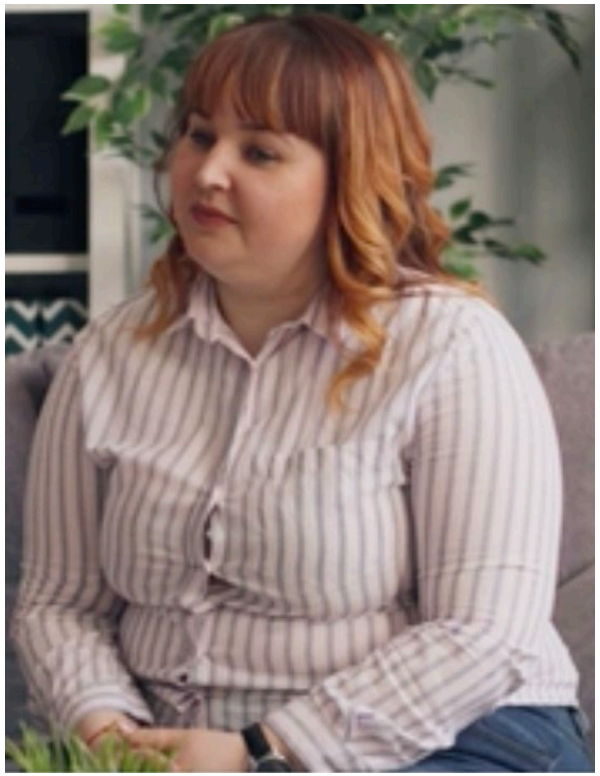
Primary Care Diabetes & Obesity Society committee member

Speaker fees and sponsorships received from:

Abbott, Astra Zeneca, Lilly, Novo Nordisk

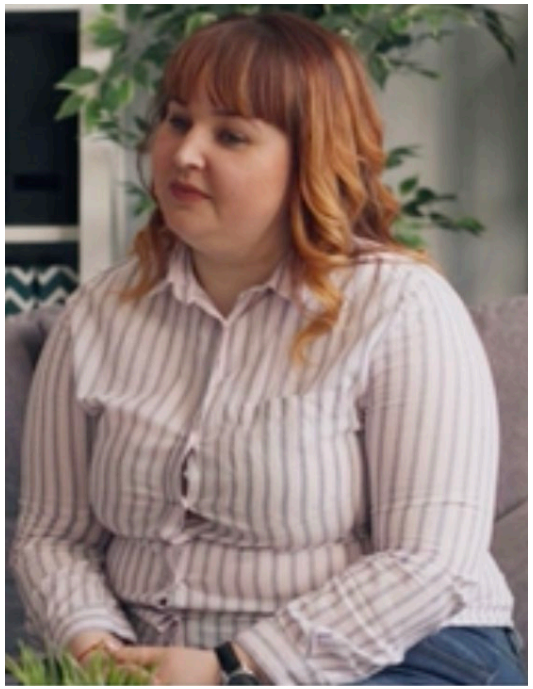
Meet Kerry



- 32 years old, Single Mum with one child, 3 years old, Part time employment in a children's nursery
- Living with obesity since teenage years
- PCOS-2015
- Depression
- Hypertension-2022
- History of gestational diabetes-2022
- Early-onset type 2 diabetes-2024

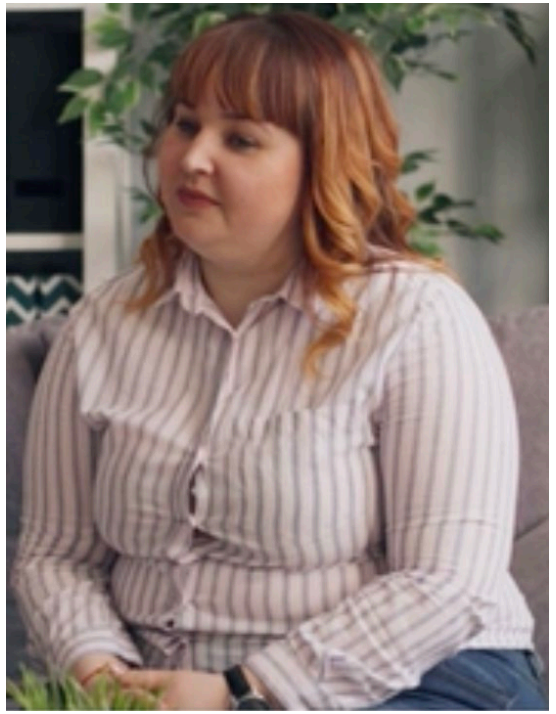
Fictional case, Photo Credit- Dr Helen Parretti presentation

About Kerry



- Tried various group commercial weight management programmes- NHS & private, low energy diet (LCD) and has tried number of fad diets over the years
- Used to be quite active when she was a child but now has very little time to the gym
- Busy life as she is a carer of her son- neurodevelopmental delays.
- Non-smoker, doesn't drink alcohol
- Binge eating type behaviour-most evenings once her son has gone to sleep and it tends to be on foods like crisps and chocolates.
- Family history- she has a mother and a grandmother both living with obesity and type 2 diabetes

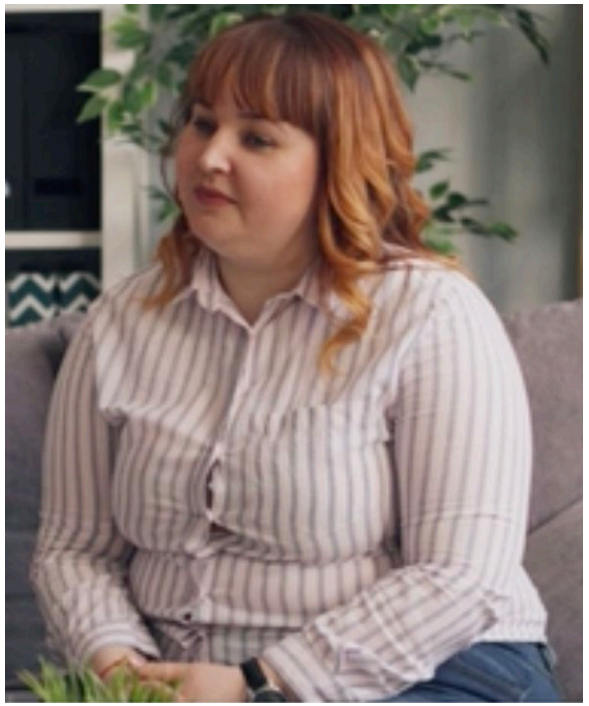
Kerry's Care processes



- HbA1c:**62mmol/mol**
- BP: **129/79mmHg**
- Lipids: TC: **5.6mmol/l**, Trigs: **2.3mmol/l**, HDLC: **1.4mmol/l**, LDLC: **2.9mmol/l**, non-HDLC: **4.2mmol/l**
- Urine ACR: **2.3mg/mmol**, **GFR:90ml/min**
- Weight: **102 kg**, BMI:**37 kg/m²**
- Foot check: Low risk both feet

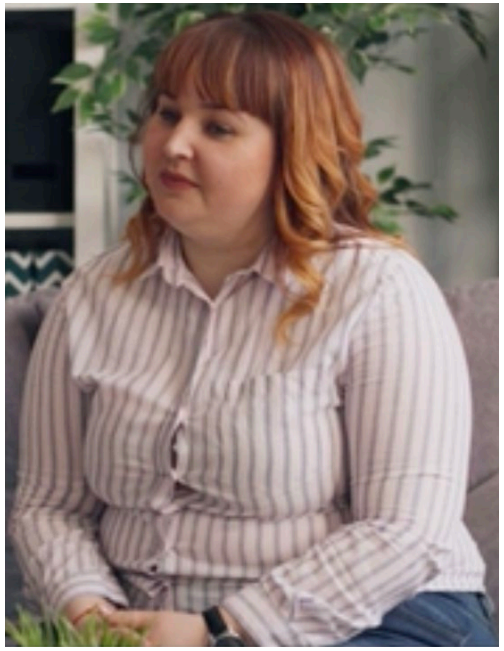
  All filed as 'Satisfactory.'

Kerry's pills



- Metformin M/R 1g twice daily
- Canagliflozin 100mg daily
- Losartan 50mg daily
- Sertraline 50mg daily
- Desogestrel 75mg daily
- Orlistat 120mg three times daily (But not issued since September 2024)

Kerry's Challenges



- Would like to have another child- appropriate Diabetes control
- PCOS-could that have been managed better?
- Weight loss interventions-wrapped around care & pharmacotherapy
- Mental health-impact on Diabetes and outcomes
- Manage her LTC- Cardiometabolic syndrome-T2D, Obesity, Hypertension, Hyperlipidaemia, cardiovascular risk

Which Diabetes is more common in Pregnancy in UK-Is it Type 1 or Type 2 ?

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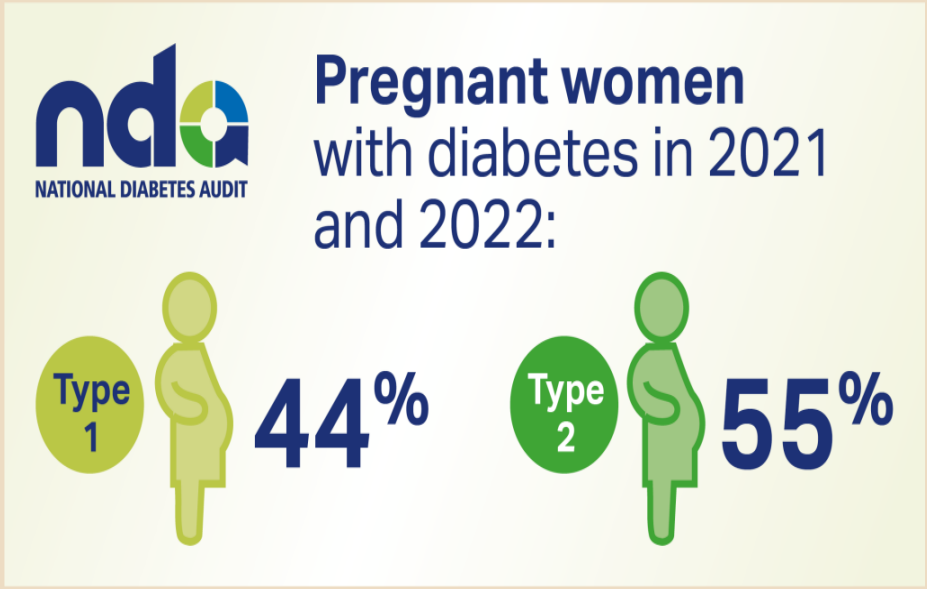

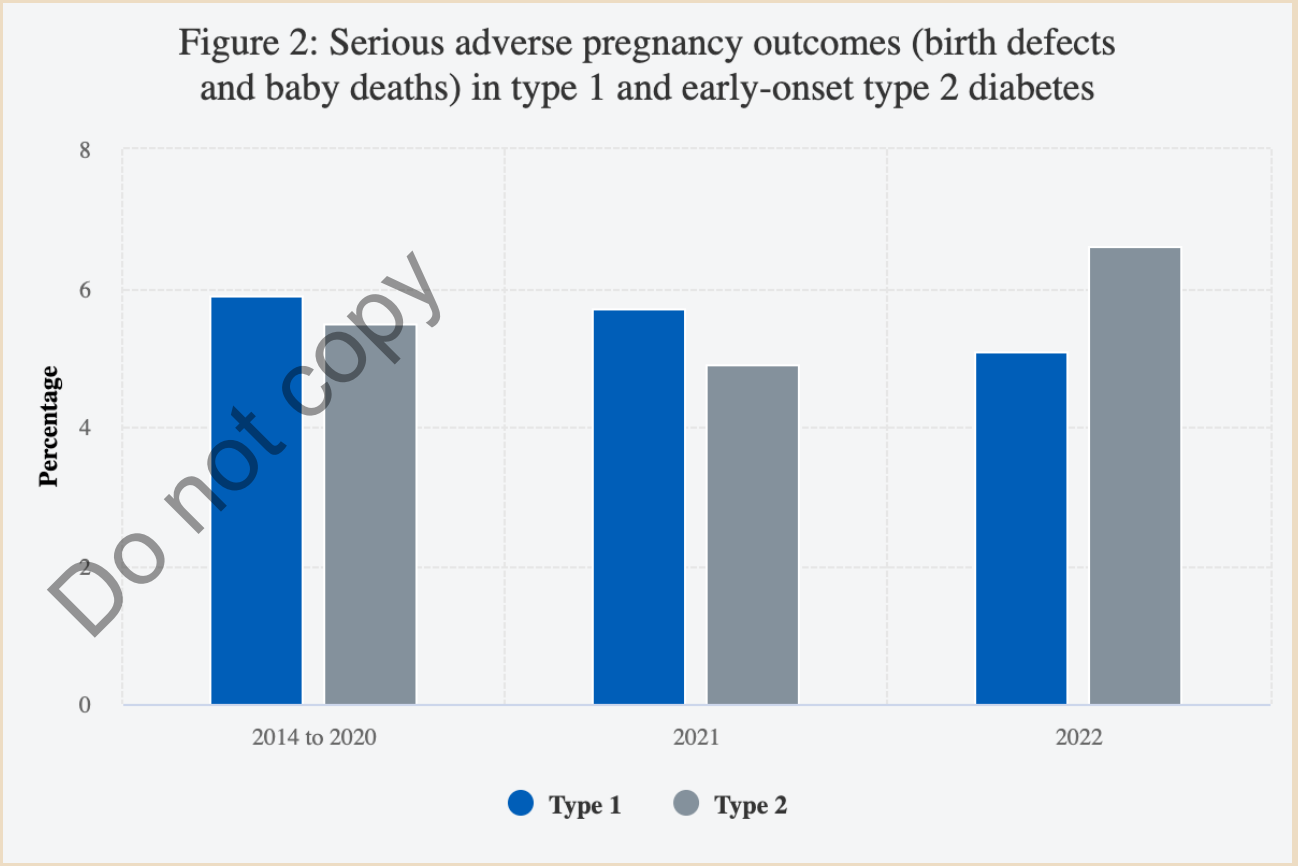

Serious adverse pregnancy outcomes are now higher in E0T2D

National Pregnancy in Diabetes Audit 2021 and 2022-https://digital.nhs.uk/data-and-information/publications/statistical/national-pregnancy-in-diabetes-audit/2022/findings

Maternal diabetes and Neonatal outcomes

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Associated with increased risk of adverse neurodevelopmental performances & neurodevelopmental outcomes -ASD & ADHD, although causality cannot be inferred-

Young women with excess weight should be supported to lose weight prior to pregnancy, lowering their risk of type 2 and gestational diabetes.

For women with pre-existing type 1 or type 2 diabetes, highlight the benefits of optimal pre-conception glycaemic control to reduce risk of adverse pregnancy outcomes.

Treat Kerry sensitively and avoid introducing weight bias or stigma.

Ye W, Luo C, Zhou J et al (2025) Association between maternal diabetes and neurodevelopmental outcomes in children:. *Lancet Diabetes Endocrinol* **13**: 494–504

Insulin requirements vs. production in normal pregnancy and pregnancy with gestational diabetes

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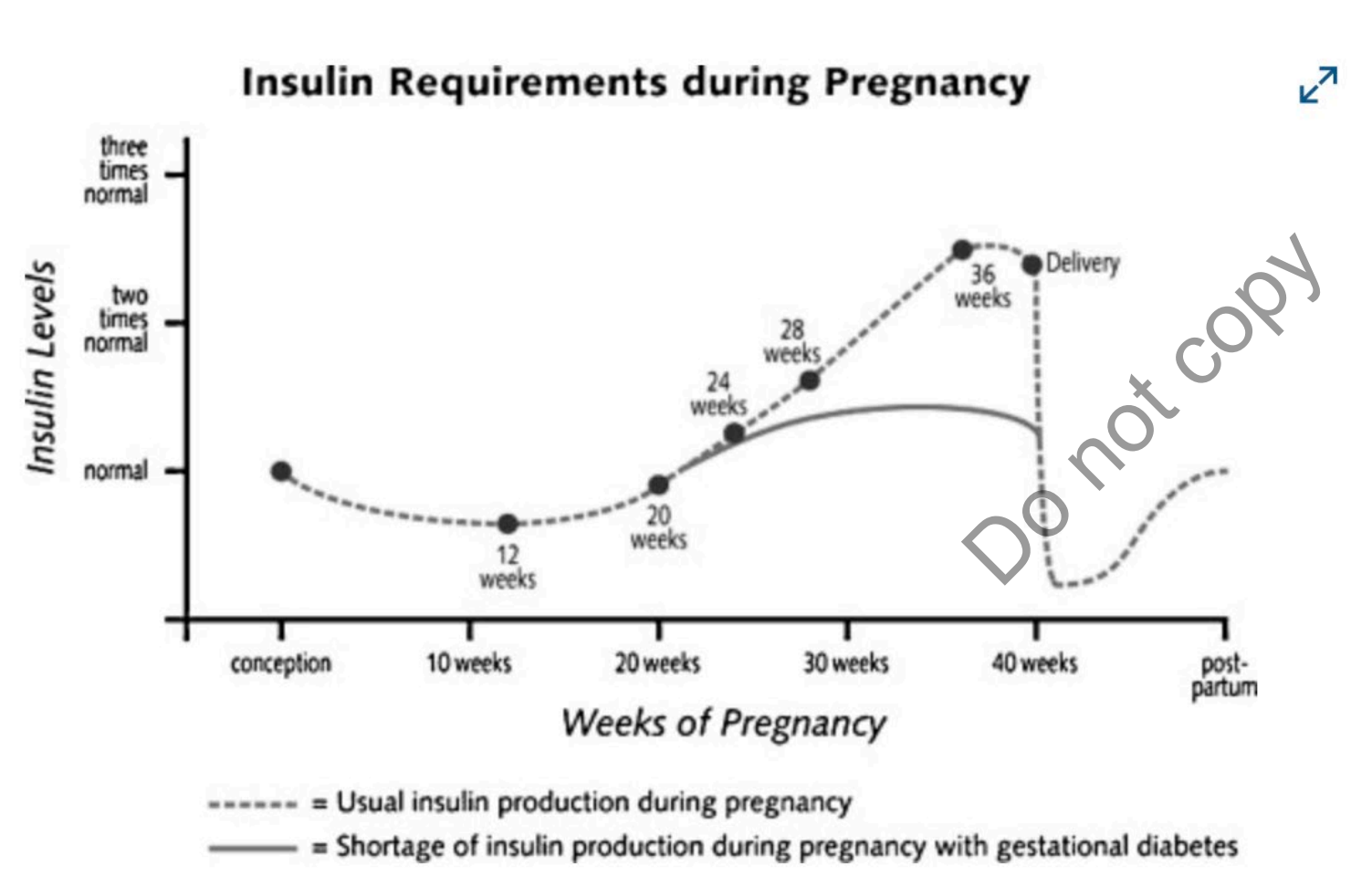

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First trimester- insulin sensitivity increases

Late second and third trimester- insulin resistance increases

Gestational diabetes mellitus: Taking it to heart Marcinkevage, Jessica A. et al.Primary Care Diabetes, Volume 5, Issue 2, 81 - 88

Measurement of HbA1c in all women at start of third trimester to 'risk stratify' & offer additional support/surveillance

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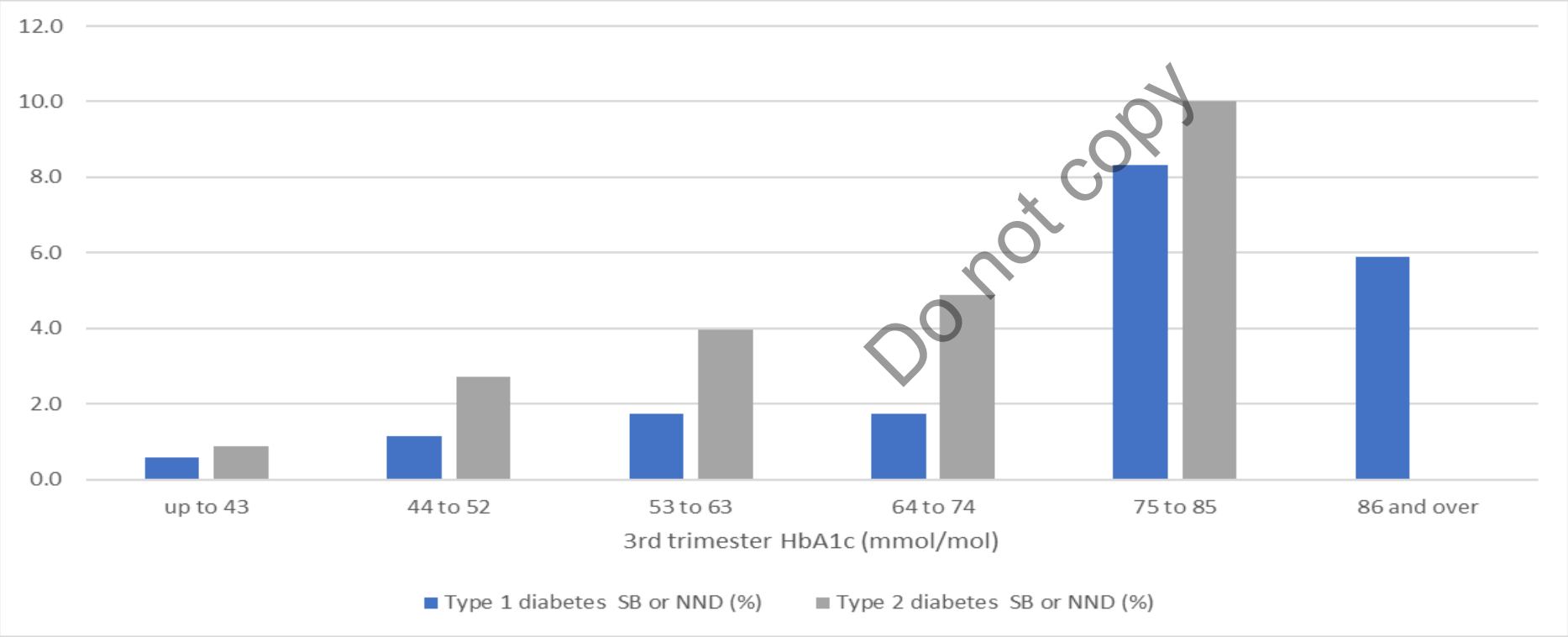
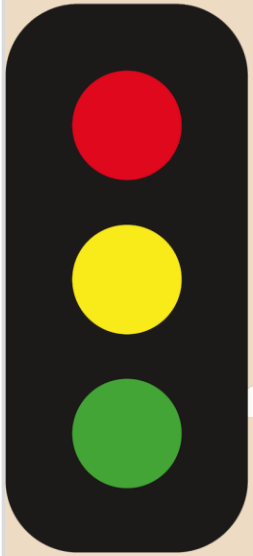
Type 2: 200 deaths (110 stillbirths, 90 neonatal deaths)
Type 1: 145 (85 stillbirths, 60 neonatal deaths)





>48mmol/mol

44-48mmol/mol

<43 mmol/mol

HbA1c >43mmol/mol after 24/40 key modifiable risk factor for perinatal death in T2D

https://www.england.nhs.uk/publication/saving-babies-lives-version-three/**a care bundle for reducing perinatal mortality**

Gestational Diabetes & Why do we need a Follow-up?

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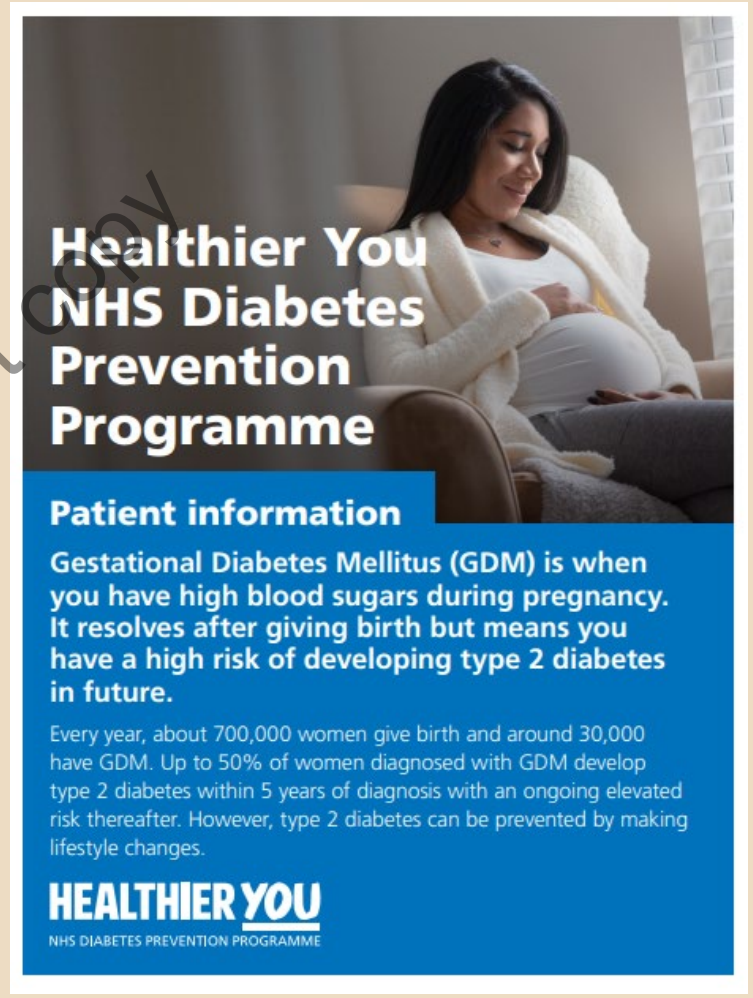
- Gestational diabetes (GDM) affects at least 5% of pregnancies in the UK
- 50% of women with gestational diabetes go on to develop Type 2 diabetes within 5 years
- Increased lifetime risk of cardiometabolic syndrome
- NICE NG3 guidance recommends fasting plasma glucose testing 6–13 weeks following delivery, or either fasting plasma glucose or HbA_{1c} after 13 weeks
- All women with a history of gestational diabetes are eligible for the NHS Diabetes Prevention Programme

NHS England (2024) *Healthier You: NHS Diabetes Prevention Programme. Gestational diabetes (GDM)*.

Healthier You Diabetes Prevention Programme

- General Practice referral or patient self-referral*
- Eligible for referral regardless of HbA1c or glucose levels



Mental health & Diabetes

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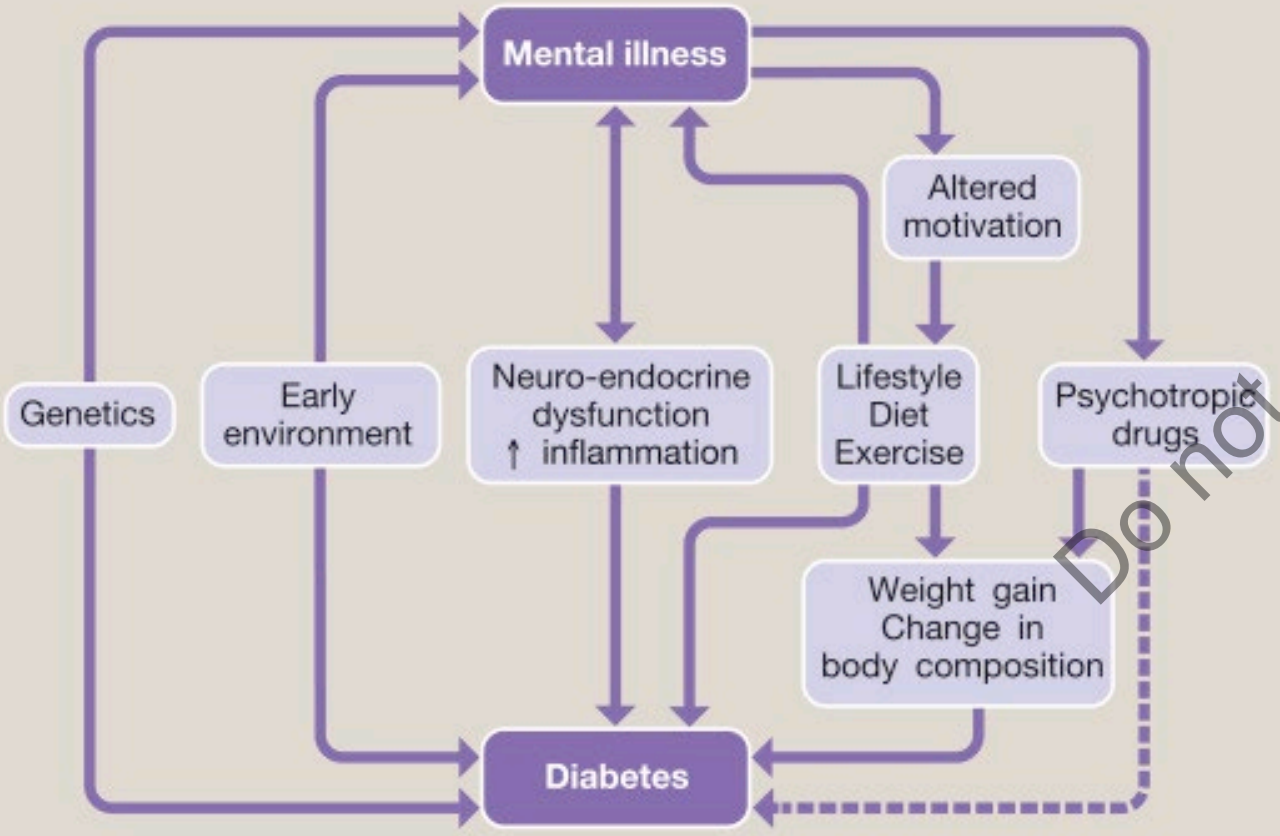

Adapted from Holt et al. Schizophrenia, the metabolic syndrome and diabetes. Diabet Med. 2004;**21**(6):515-23

The interactions between diabetes mellitus and psychiatric diseases are complex than just a two-way relationship.

Presents a significant clinical challenge for clinicians and worsens the outcomes of both conditions for patients

Screening for diabetes in people with severe mental illness is needed because of the high prevalence of undiagnosed diabetes

Diabetes in psychiatric disease, Holt, Richard I.G. Medicine, Volume 47, Issue 2, 123 –126 February 2019,

Mental Health, medications and Diabetes

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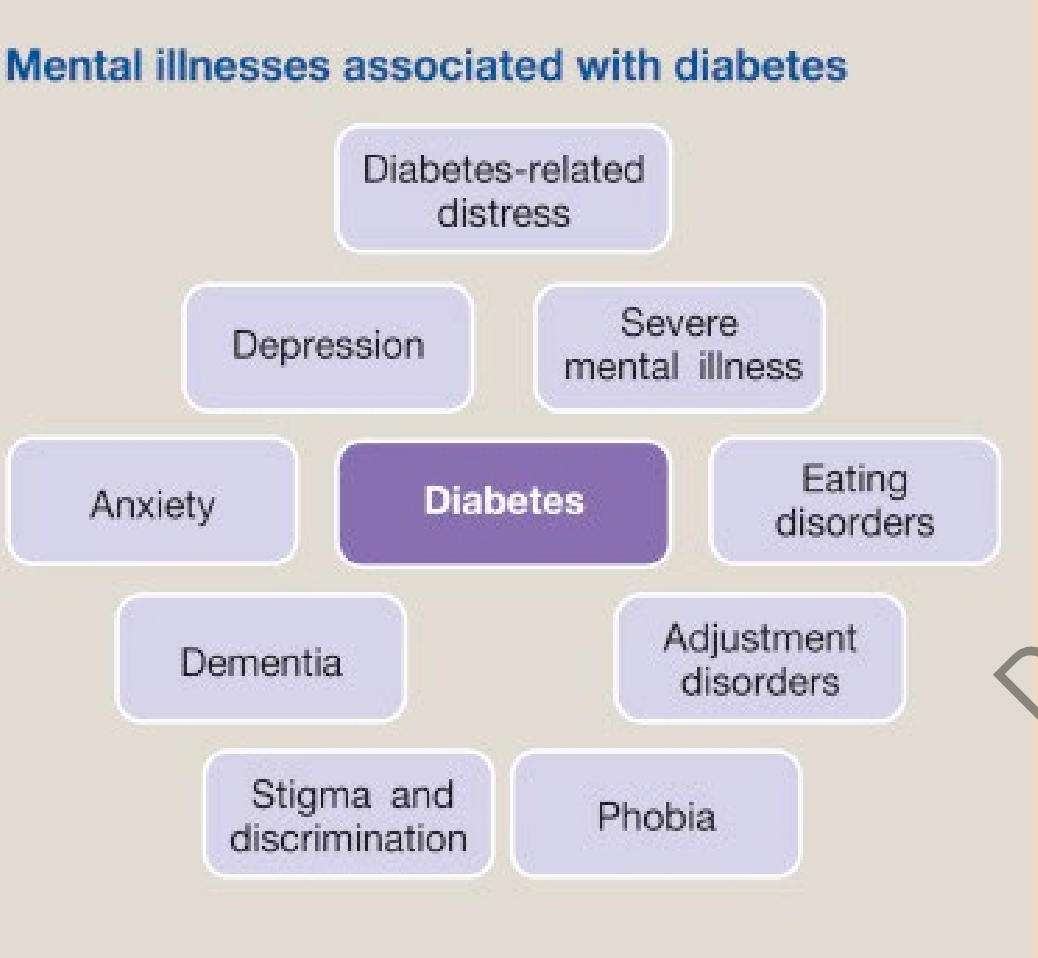

Escitalopram, paroxetine, and duloxetine were associated with 10%- 15% higher risk for gaining at least 5% of baseline weight compared to Sertraline.

Mirtazapine is associated with a significant increase in body weight & body fat mass, and lower leptin concentration.

- **Has depression and medication been reviewed recently? Are they still needed?**
- **Could non-drug therapies be an option?**
- **Consider talking therapies, CBT, social prescriber if available.**

1. Young PJ et al; Ann Intern Med: 2024 Jul 2 2. Laimer M et al; J Clin Psychiatry. 2006 Mar;67(3):421-4.
Diabetes in psychiatric disease, Holt, Richard I.G. Medicine, Volume 47, Issue 2, 123 –126 February 2019

Polycystic Ovary Syndrome (PCOS)

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Most common endocrine disorder in women of reproductive age
Characterized by Insulin resistance and Hyperinsulinaemia

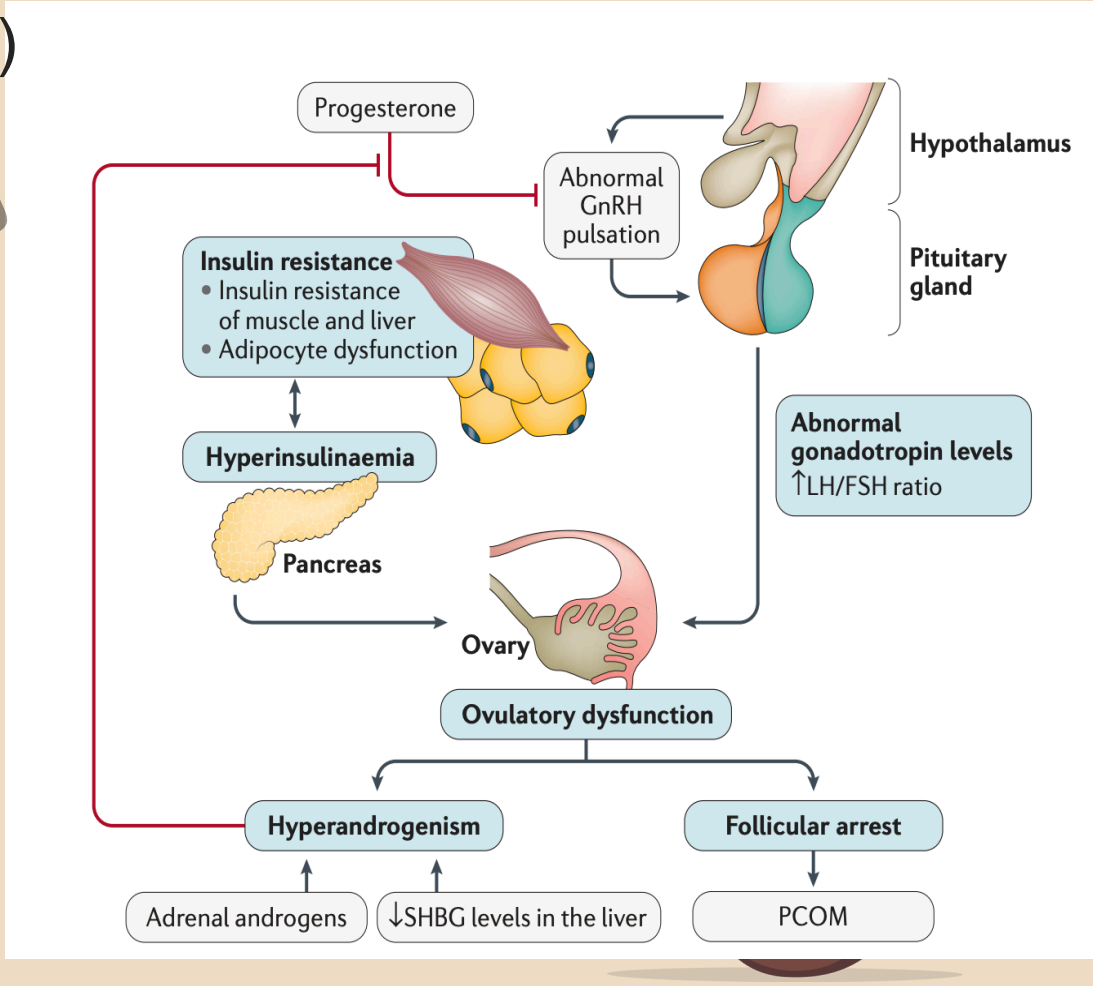
Prevalence of Impaired Glucose Tolerance(31-37%) and T2 diabetes (7.5–10.0%) in women with PCOS

Be alert to possibility as up to 70%of women with this condition remain undiagnosed

Evaluation of the glycaemic status of women is recommended every 1–3 years,

Role of metformin in PCOS

MDT approach, lifestyle modification, medications



Azziz, R., Carmina, E., Chen, Z. *et al.* Polycystic ovary syndrome. *Nat Rev Dis Primers* **2**, 16057 (2016).

Early-Onset Type 2 Diabetes

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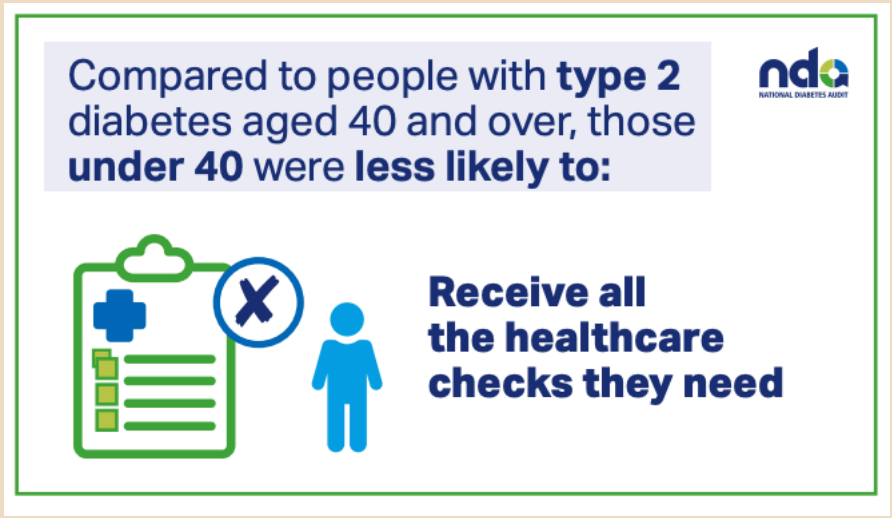
- Defined as T2D occurring in people younger than 40 years old.
- EOT2D is associated with a more aggressive diabetes phenotype than older-onset Type 2 diabetes
- Early development of complications with significant reduction in life expectancy
- Higher risk, but lower standards of care.

Box 1. Risk factors for development of early-onset type 2 diabetes.

- Obesity
- Physical inactivity
- Strong family history of type 2 diabetes
- Black, Asian and Hispanic ethnicity
- Female sex
- Socioeconomic deprivation
- Personal or maternal history of gestational diabetes
- Polycystic ovarian syndrome



Vulnerable group as they are hard to reach. They are often lost to follow up.

National Diabetes Audit: Young people with type 2 diabetes 2021–22, England and Wales
https://files.digital.nhs.uk/F7/39428A/Young_People_With_Type_2_Diabetes_202122.pdf

Early-Onset Type 2 Diabetes -Potential mechanisms responsible

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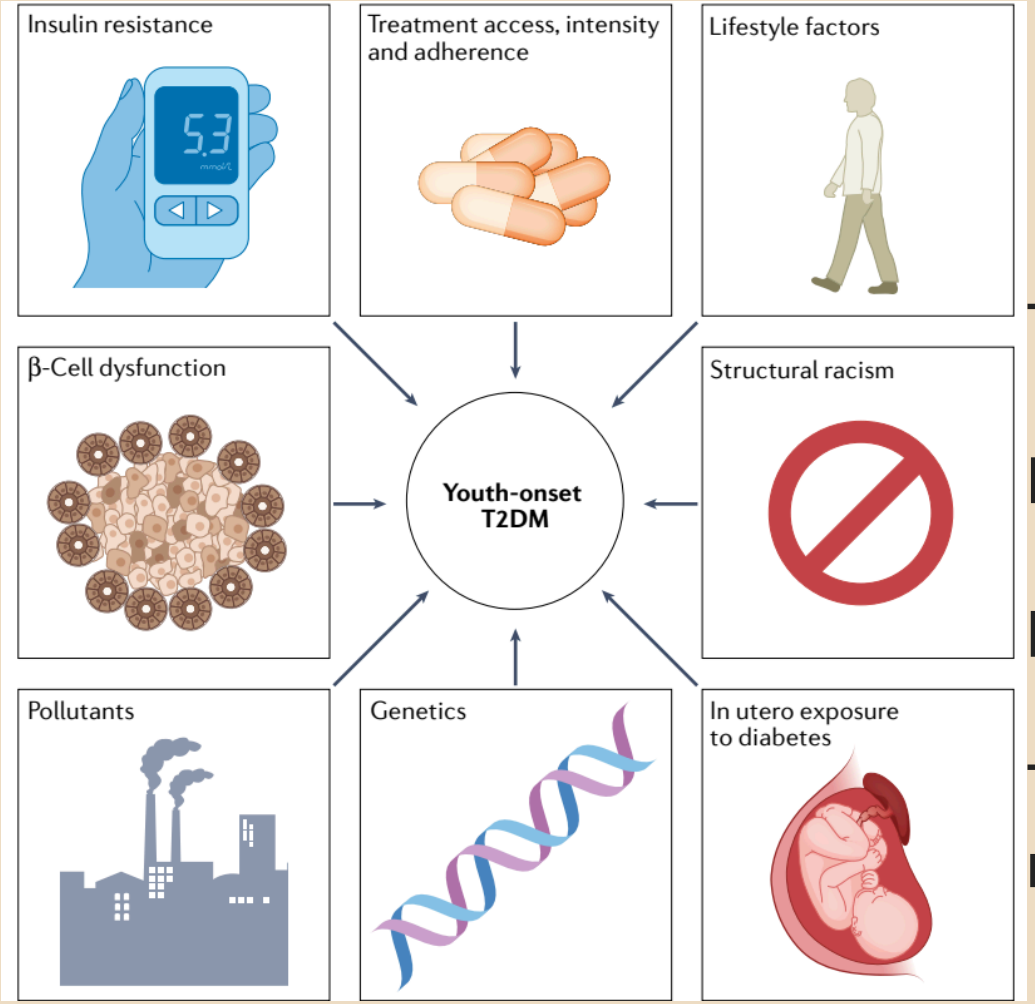
As of 2023, England's 18-40 years old with type 2 diabetes now exceed those with type 1 diabetes



Aggressive clinical phenotype in Early-Onset T2DM.

There is higher prevalence among women than men.

Decline in beta cell function is more rapid < age of 40

More likely to require insulin therapy at earlier age.

Tend to have different physical and psychological needs.

Youth-onset type 2 diabetes mellitus: an urgent challenge. *Nat Rev Nephrol* **19**, 168–184 (2023) Bjornstad, P. *et al.*

Treatment Targets in Early-Onset Type 2 Diabetes

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- **Glycaemic management:** Individualised, but aim for HbA1c < 48mmol/mol.
- **Weight management:** Initial target of 5-10% body weight. (Greater weight loss increases chance of remission). Consider bariatric surgery if eligible.
- **Lifestyle:** Diet, Physical activity, Smoking cessation.
- **Blood pressure:** Generally 140/90mmHg, but lower if high risk.
- **Lipids:** Use a lifetime cardiovascular risk assessment tool: QRISK3-lifetime. Statins appropriate for most people with EOT2D.
- **Mental & social well-being**: Wider team, health trainers, social prescribers.

Regular review and manage risk intensively

Long-term complications of Youth-Onset T2DM

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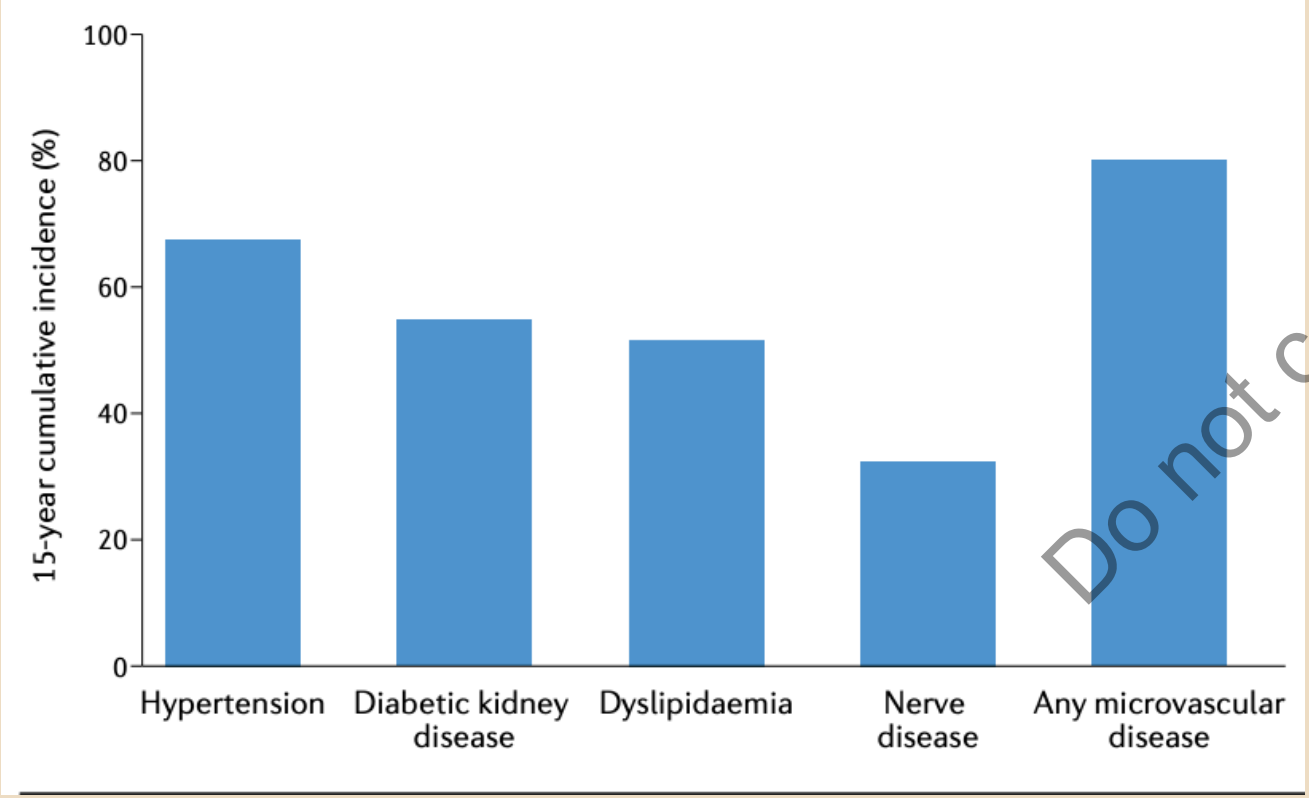

Early intensive risk factors treatment in EOT2D can further extend the life expectancy so benefits would be greater.

Metformin, Insulins, GLP1 Agonist, SGLT2 inhibitors (licensed beyond 18)
Bariatric surgery

The 15-year cumulative incidence of complications in participants in the TODAY trial

Youth-onset type 2 diabetes mellitus: an urgent challenge. *Nat Rev Nephrol* **19**, 168–184 (2023) Bjornstad, P. *et al.*

Consider referral to the NHS Type 2 Diabetes Pathway to Remission Programme

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NHS England

- ✓ Aged 18 – 65 years,
- ✓ A diagnosis of type 2 diabetes within the last 6 years, and
- ✓ A BMI over 27 kg/m^2 (where individuals are from White ethnic groups) or over 25 kg/m^2 (where individuals are from Black, Asian and other ethnic groups)
- ✓ HbA1c <87 mmol/mol

NHS

xyla health & wellbeing
Part of Acacium Group

The NHS Type 2 Diabetes Path to Remission Programme

Patient information

What is it?

A free programme designed to help you reduce your diabetes medications, lose weight, improve your health, and potentially put your type 2 diabetes into remission.

You will be offered low calorie, total diet replacement products (typically soups, shakes and porridges) totalling 800-900 kilocalories per day, to replace all normal meals for 12 weeks.

You will receive support and monitoring for 12 months, including help to re-introduce food after the initial 12-week period.

We understand that everyone has their own preferences, and we provide two options for accessing the service to best suit your needs. This will be either;

- One-to-one in person support; or
- One-to-one digital support

Coaching sessions are delivered by one of our qualified diabetes practitioners, along with online learning and resources including meal plans and recipes.

This support will provide you with the help and advice you need throughout every phase of the programme. Your GP practice will be kept informed of your progress and if any medication changes might be needed.

How does it work?

The NHS Type 2 Diabetes Path to Remission programme is 12 months long and is split into 3 key stages:

Onboarding	Stage 1	Stage 2	Stage 3
Getting started	TDR phase	Food re-introduction phase	Weight maintenance phase
Week 0	Weeks 1-12	Weeks 13-18	Weeks 19-52
Participants will be supported by one of our friendly team members to talk through the programme and support them to choose the delivery model that is most suitable for them.	Participants will replace their usual diet with their chosen total diet replacement (TDR) products. They will also start working with one of our diabetes practitioners on a range of behavioural change sessions.	Our diabetes practitioners will support participants to re-introduce food into their diet in a safe, healthy way. This includes helping with meal planning, understanding nutrition and a healthy balanced diet.	The final phase of the programme will provide participants with the knowledge and tools they need to continue to achieve their health and wellbeing goals - and hopefully put their type 2 diabetes into remission.

https://www.england.nhs.uk/diabetes/treatment-care/diabetes-remission/

Pregnancy Planning- Preconception care

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Risks can be managed by:

- **Attendance at pre-conception clinic**
- **Optimisation of blood glucose (HbA1c<48mmol/mol)**
- **Folic acid supplement, starting 3 months before pregnancy and until 12 weeks gestation-5mg**
- **Vitamin D supplement during pregnancy**
- **Retinal and renal assessment**
- **Dietary advice, weight and exercise**
- **Ensure routine monitoring up-to-date**

Contraception and Planning for safe & Healthy pregnancy

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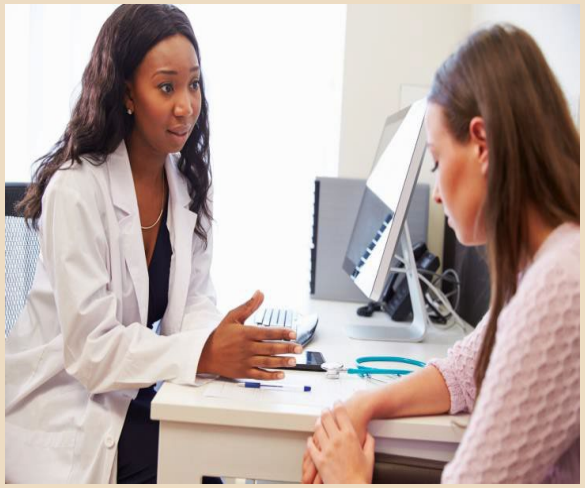
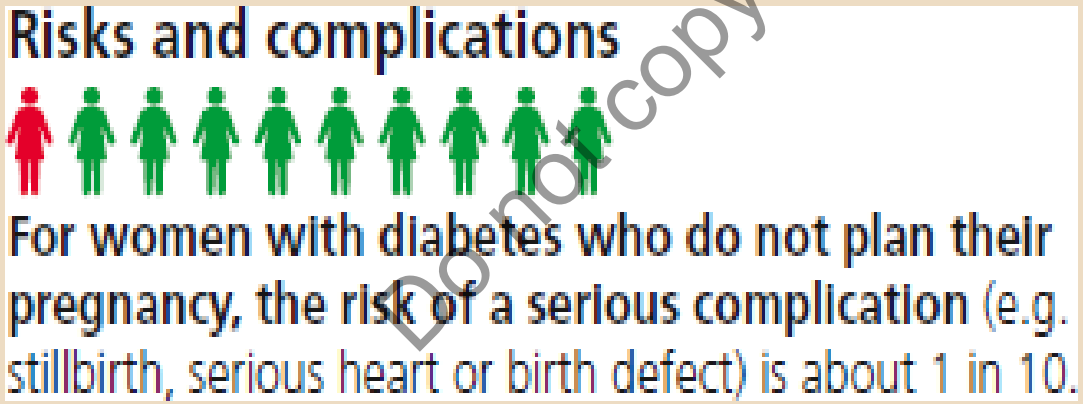


Given that as many as 50% of pregnancies are unplanned, the importance of contraception can't be understated.

Using contraception until 'pregnancy ready'



Working with diabetes team to get 'pregnancy ready' reduces these risks to 1 in 50
HbA1c less than 48 mmol/mol (advise women with HbA1c >86 mmol/mol to avoid pregnancy
Check all medication is safe and on folic acid 5mg od

National Pregnancy in Diabetes Audit Report 2020 - NHS Digital

Pregnancy Planning: Medication

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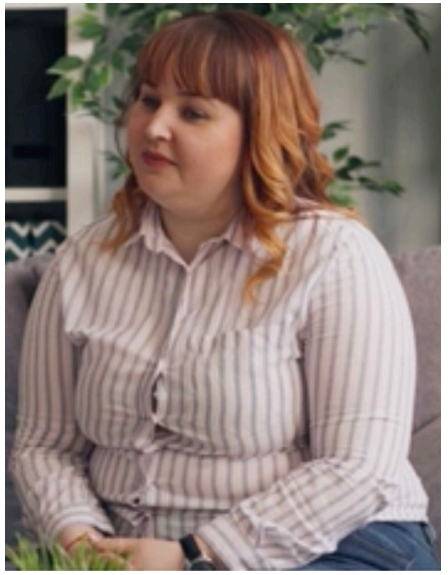
- Metformin and insulin are the only diabetes medications recommended in pregnancy. All other medicines should be switched if actively trying to conceive, including SGLT2 inhibitors, incretin mimetics*, sulfonylureas, DPP inhibitors
- Statins should be paused ahead of pregnancy
- ACEi/ARBs should be paused ahead of pregnancy. Hypertension managed with labetalol unless contraindicated
- Aspirin may be indicated for a higher risk pregnancy

Back to Kerry-What are the options for her



- Consider lipid management - Atorvastatin, Ezetimibe. Use QRISK3-lifetime risk calculator
- Consider GLP1/GLP1-GIP agonist along with lifestyle/behavioural changes to support weight loss
- Important factors to consider when she is planning for her next pregnancy-optimal glycaemic management, folic acid 5mg
- Consider CGM in pregnancy for type 2 diabetes on insulin if:
  - Severe hypoglycaemia (with or without impaired awareness)
  - Unstable glucose levels despite efforts to optimise glycaemic management [NICE NG3, 2015 amended 2020]

Adequate preparation for pregnancy is essential to avoid adverse foetal outcomes

Key messages to learn from Kerry

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Gestational Diabetes: Increasing incidence, with a high risk of developing type 2 diabetes later. Follow-up and prevention programs are recommended.

Mental Health and Diabetes: The interaction between diabetes and mental health is complex. Consider impact of medication on weight.

Polycystic Ovary Syndrome (PCOS): PCOS is a common endocrine disorder in women of reproductive age, characterized by insulin resistance and a high prevalence of type 2 diabetes. Regular evaluation and a multidisciplinary approach are recommended.

Early-Onset Type 2 Diabetes: Early-onset type 2 diabetes (EOT2D) is more aggressive and leads to early complications. Requires early intensive management and regular review to manage risk and extend life expectancy.

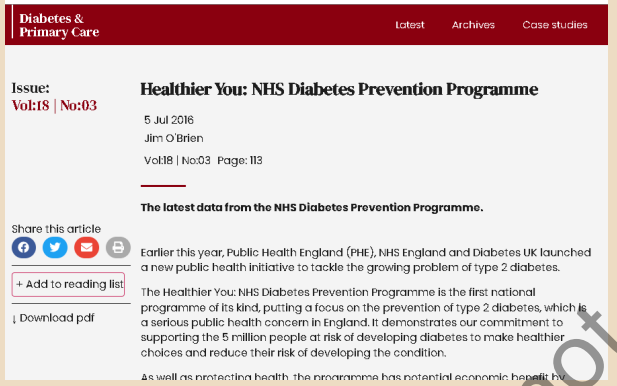
Pregnancy Planning and Management: Preparation and management of diabetes during pregnancy are crucial. Contraception until pregnancy-ready.

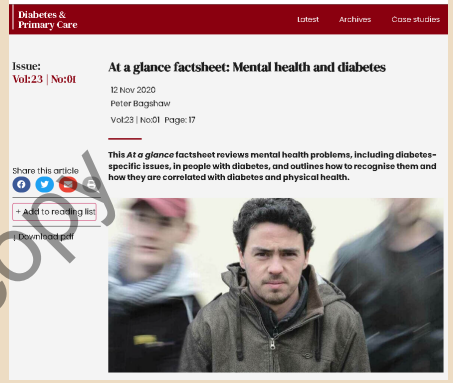
Thank you for listening

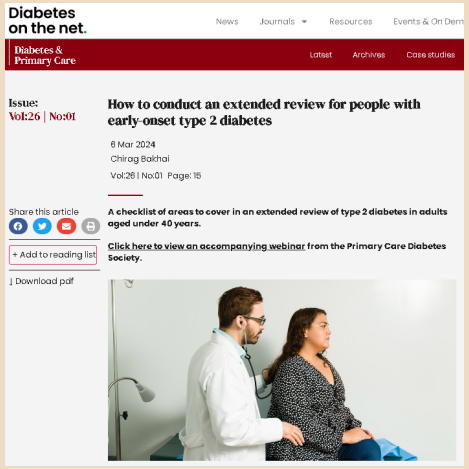
PCDO Society

pcdosociety.org

Resources: www.diabetesonthenet.com







https://www.verity-pcos.org.uk/

Table 2. Postpartum diabetes screening interpretation.

Fasting glucose (6–13 weeks)	HbA_{1c} result (>13 weeks)	Interpretation
≥6.0 mmol/L	<39 mmol/mol (<5.7%)	• Moderate risk of type 2 diabetes • Lifestyle and dietary advice • Referral to NHS Diabetes Prevention Programme • Annual HbA_{1c}, lipids, blood pressure
6.1–6.9 mmol/L	39–47 mmol/mol (5.7–6.4%)	• High risk of type 2 diabetes • Lifestyle and dietary advice • Referral to NHS Diabetes Prevention Programme • Annual HbA_{1c}, lipids, blood pressure
≥7.0 mmol/L	≥48 mmol/mol (≥6.5%)	• Repeat fasting plasma glucose within 2 weeks to confirm diagnosis of type 2 diabetes • Consider repeat HbA_{1c} to confirm diagnosis of type 2 diabetes