

Diabetes and Pregnancy – the how's, why's and wherefores of optimal management including pregancy outcomes in earlyonset type 2 diabetes

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Chair National Pregnancy in Diabetes (NPID) audit

Overview



- ✓T1D pregnancy successes
- ✓ Prevalence of Early-Onset T2D (EOT2D)
- ✓ National Pregnancy in Diabetes (NPID) audit highlights
- ✓ Saving Babies Lives Care Bundle (SBLCB)
- ✓T2Day programme
- ✓ National T2D prevention & remission programmes
- ✓NDA GDM audit

Primary Aim of CONCEPTT

 To assess the effectiveness of CONTINUOUS real-time CGM on glycemic control in women with T1D who were pregnant or planning pregnancy

Continuous glucose monitoring in pregnant women with type 1 diabetes (CONCEPTT): a multicentre international randomised controlled trial

Denice S Feig, Lois E Donovan, Rosa Corcoy, Kellie E Murphy, Stephanie A Amiel, Katharine F Hunt, Elisabeth Asztalos, Jon F R Barrett, J Johanna Sanchez, Alberto de Leiva, Moshe Hod, Lois Jovanovic, Erin Keely, Ruth McManus, Eileen K Hutton, Claire L Meek, Zoe A Stewart, Tim Wysocki, Robert O'Brien, Katrina Ruedy, Craig Kollman, George Tomlinson, Helen R Murphy, on behalf of the CONCEPTT Collaborative Group*



Articles

"Use of continuous glucose monitoring during pregnancy in patients with type 1 diabetes is associated with improved reconatal outcomes, which are likely to be attributed to refluced exposure to matemal hyperglycaemia."

THE LAN



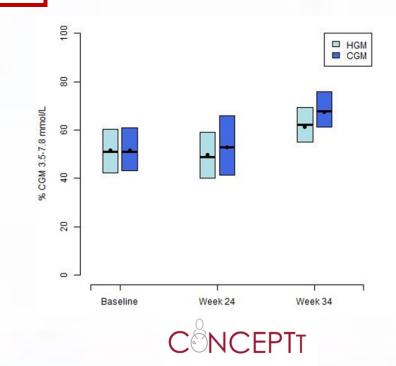
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NICE NG3 updated guidance 16th December 2020

Intermittently scanned CGM and continuous glucose monitoring

- 1.3.17 Offer continuous glucose monitoring (CGM) to all pregnant women with type 1 diabetes to help them meet their pregnancy blood glucose targets and improve neonatal outcomes. [2020]
- 1.3.18 Offer intermittently scanned CGM (isCGM, commonly referred to as flash) to pregnant women with type 1 diabetes who are unable to use continuous glucose monitoring or express a clear preference for it. [2020]
- 1.3.19 Consider continuous glucose monitoring for pregnant women who are on insulin therapy but do not have type 1 diabetes, if:
 - they have problematic severe hypoglycaemia (with or without impaired awareness of hypoglycaemia) or
 - they have unstable blood glucose levels that are causing concern despite efforts to optimise glycaemic control. [2015, amended 2020]
- 1.3.20 For pregnant women who are using isCGM or continuous glucose monitoring, a member of the joint diabetes and antenatal care team with expertise in these systems should provide education and support (including advising women about sources of out-of-hours support). [2020]



T1D Pregnancy outcomes

Outcome

Improved pregnancy glucose levels with:

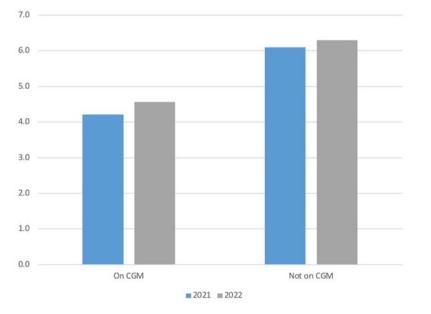
- ✓ Fewer LGA babies
- ✓ Fewer preterm births
- ✓ Fewer neonatal intensive care unit admissions





Reduced serious adverse pregnancy outcomes

(Birth defects, stillbirth, baby death)



N=2400 'real-world' CGM users NPID State of the Nation report to be published Oct 2023



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Automated Insulin Delivery in Women with Pregnancy Complicated by Type 1 Diabetes

Tara T.M. Lee, M.B., B.S., Corinne Collett, B.Sc., Simon Bergford, M.S., Sara Hartnell, B.Sc., Eleanor M. Scott, M.D., Robert S. Lindsay, Ph.D.,
Katharine F. Hunt, M.D., David R. McCance, M.D., Katharine Barnard-Kelly, Ph.D., David Rankin, Ph.D., Julia Lawton, Ph.D., Rebecca M. Reynolds, Ph.D.,
Emma Flanagan, Ph.D, Matthew Hammond, M.Sc., Lee Shepstone, Ph.D.,
Malgorzata E. Wilinska, Ph.D., Judy Sibayan, M.P.H., Craig Kollman, Ph.D.,
Roy Beck, Ph.D., Roman Hovorka, Ph.D., and Helen R. Murphy, M.D.,
for the AiDAPT Collaborative Group*

Listening to women: experiences of using closed-loop in type 1 diabetes pregnancy Prof. Julia Lawton,Dr. David Rankin, and Prof. Helen Murphy Published Online: 5 Oct 2023https://doi.org/10.1089/dia.2023.0323

Most young people with EOT2D are female

- ✓ 1,144 in paediatrics ~ 8/clinic
 ✓ 8,245 (84%) aged 19-25 yrs
 ✓ 66% are women
- ✓ 66% in primary care ~1/GP clinic
- ✓ 54% of diabetes pregnancies
 ~20/clinic
- ✓ 33-50% previous GDM pregnancy

Age group	Number of people
Under 12 years	105
12-15 years	545
16-18 years	910
19-25 years	<mark>8,245</mark>
All 0-25	9805

Number of young people with Type 2 diabetes in England (Young People with Type 2 Diabetes, 2019-20; NDA & NPDA)

Effective Communication About Pregnancy, Birth, Lactation, Breastfeeding and Newborn Care: The Importance of Sexed Language Gribble KD et al, Front Glob Womens Health. 2022 Feb 7;3:818856.



Pregnancy Outcomes in Young Women With Youth-Onset Type 2 Diabetes Followed in the TODAY Study

Diabetes Care 2022;45:1038–1045 | https://doi.org/10.2337/dc21-1071

TODAY Study Group*

Report on 260 pregnancies in 141 women in the TODAY (Treatment Options for Type 2 Diabetes in Adolescents and Youth) Study

260 pregnancies in 141 women & girls

42% were non-Hispanic Black

35% were Hispanic

AGE 20.5 years



(D BMI

35.4 kg/m²





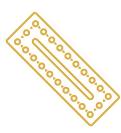








Pre-pregnancy counseling was reported in 16% of the people



Only 15% reported using any method of contraception prior to the first pregnancy



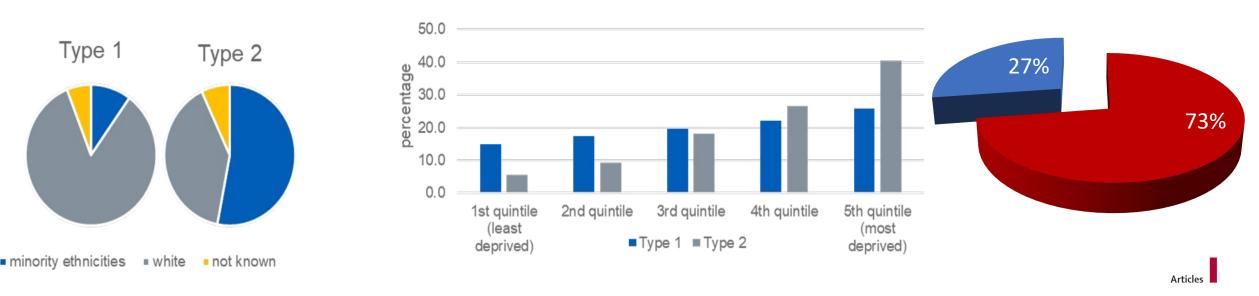
65% had a maternal pregnancy complications

25% had a miscarriage or stillbirth



National Pregnancy in Diabetes (NPID) audit

- 2002-03 CEMACH 2,359 pregnancies (1707 T1D, 652 T2D)
- 2019-2022 NPID 4,828 pregnancies (2161 T1D, 2667 T2D)



Characteristics and outcomes of pregnant women with type 1 or type 2 diabetes: a 5-year national population-based cohort study

Murphy HR et al, 2017. Diabetologia; Murphy HR et al, 2021 Lancet Diab Endo

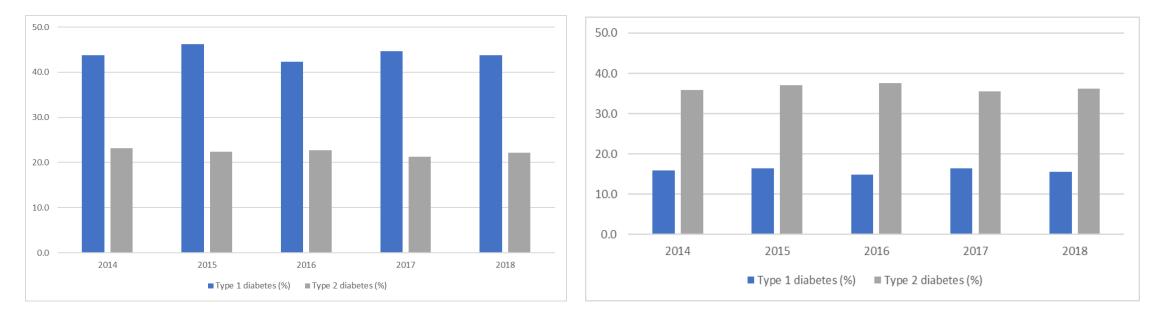
CEMACH 2002-03

ielen R Murphy, Carla Howgate, Jackie O'Keefe, Jenny Myers, Margery Morgan, Matthew A Coleman, Matthew Jolly, Jonathan Valabhiji, Eleanor M Scott, Peter Knighton, Bob Young, Nick Lewis-Barned, on behalf of the National Pregnancy in Diabetes (NPID) advisory group*

Where women adequately prepared for pregnancy?

5mg folic acid before pregnancy

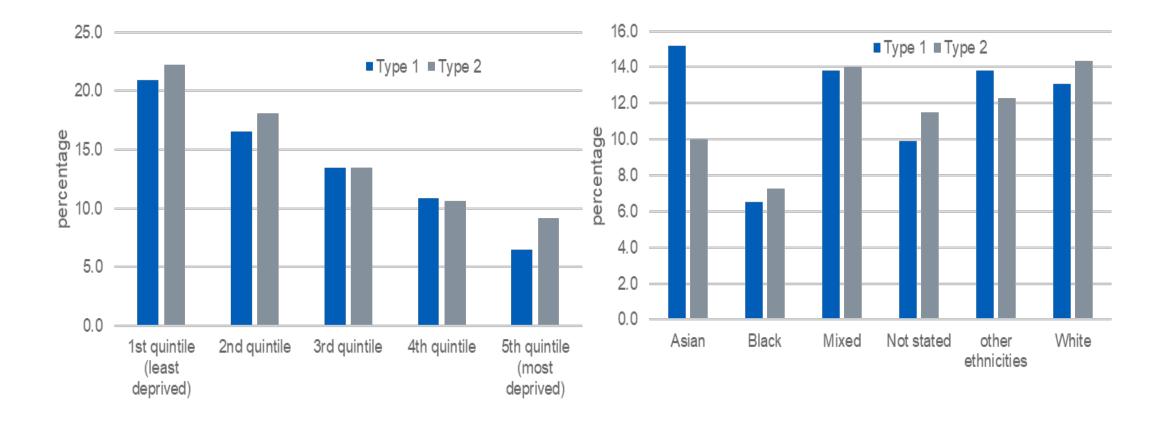
Maternal HbA1c in early pregnancy



ONLY ONE IN EIGHT PREPARED FOR PREGNANCY!

65% women with EOT2D taking metformin before pregnancy 2/3 had HbA1c >48mmol/mol but only 18% taking insulin

Health inequalities in pregnancy preparation

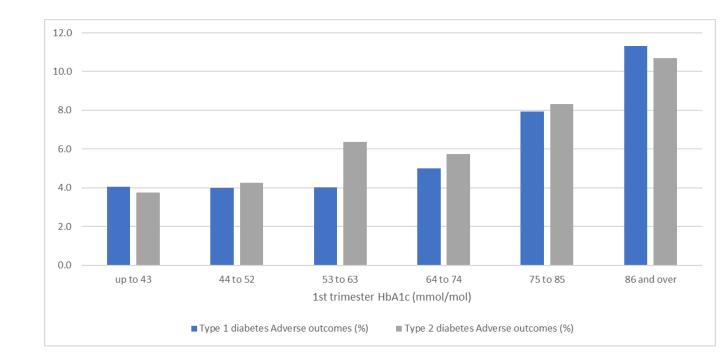


Planning for a safe & healthy pregnancy

Risks and complications For women with diabetes who do not plan their pregnancy, the risk of a serious complication (e.g. stillbirth, serious heart or birth defect) is about 1 in 10.

Reassuringly, if you do plan your pregnancy with your diabetes team, your risk of serious complications falls closer to that of women without diabetes (1 in 50).





Already pregnant? We can help.

If you are pregnant and you didn't plan your pregnancy we can help you. The specialist team at the hospital will see you as soon as possible to give you support, information and care.

This is what you need to do

- 1. As soon as you can, contact your GP/diabetes team. They will assist with:
 - A referral to the maternity unit. You can expect an appointment within 1-2 weeks
 - Getting a prescription for Folic Acid. You may need a 5mg dose and this is only available by prescription
 - A review of your medications
- Start testing your blood glucose levels before meals, 1 hour after meals, and before bed so that your diabetes treatment can be safely adjusted.



Remember...

Your diabetes team are here to help you! We can help you with contraception, planning your pregnancy and help you to have a healthy baby. If you have any questions about contraception or pregnancy get in contact today.

The Eastern Academic Health Science Network

eahsn.org.uk is working with local healthcare teams to support women with diabetes who are planning pregnancy. Email: EAHSN.diabetes@nhs.net

Useful resources/links

fpa.org.uk The website of the Family Planning Association – all you ever wanted to know about contraceptive methods, plus an easy-to-use tool to find the best contraceptive methods for you.

diabetes.org.uk Good section on pregnancy in the "Living with diabetes" section, on contraception in the "teenagers" section, and giving up smoking advice.

womenwithdiabetes.net Lots of information, video clips and other women's stories.

gofolic.org.uk Information on the benefits of folic acid and the Before You Frolic, Go Folic! Campaign.

Pregnant with diabetes app Free from Google play. Loads of information including planning for pregnancy

If this information has come at a bad time, causes you concern or is not relevant to you, please accept our sincere apologies and feel free to let us know.

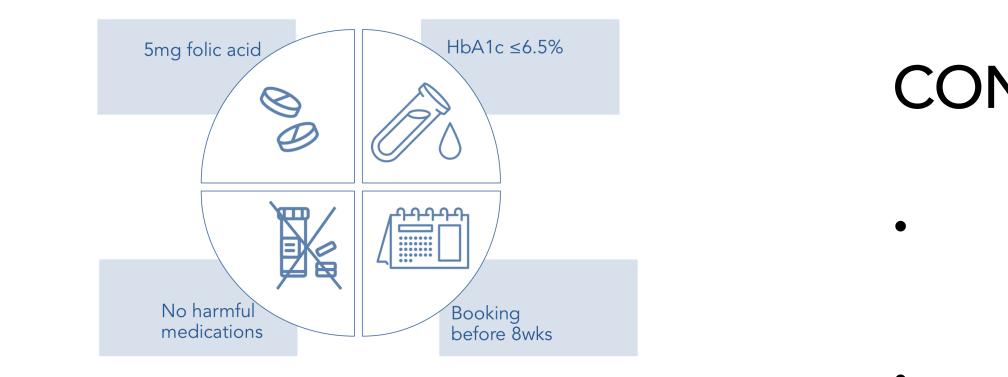


Sex, contraception and pregnancy

Important information for women with Type 1 and Type 2 diabetes

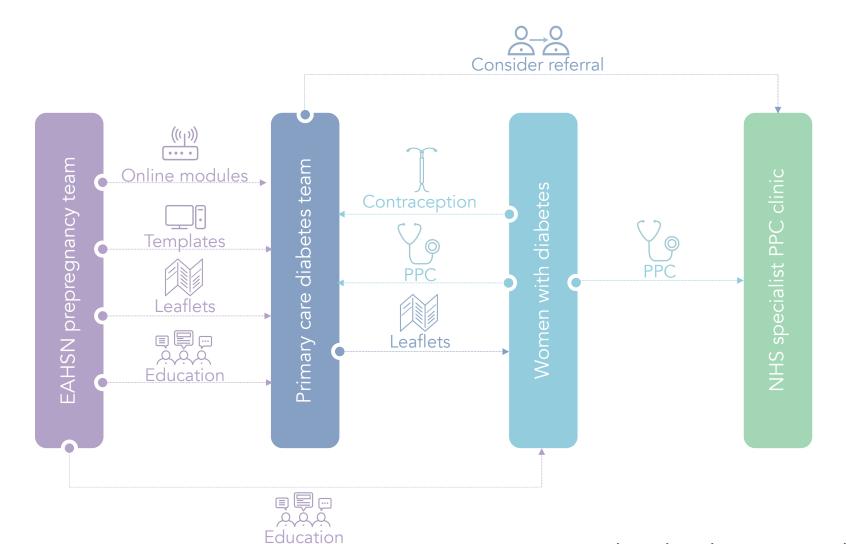


Planning for a safe & healthy pregnancy



https://www.tommys.org/pregnancy-information/planning-pregnancy/planning-for-pregnancy-tool https://abcd.care/resource/planning-pregnancy

Community-based pre-pregnancy care improves pregnancy preparation in T2D



Yamamoto J et al; Diabetologia. 2018 Jul;61(7):1528-1537

Pre-pregnancy care is as effective in T2D as T1D

ates of adverse pregnancy outcome

birth, or neonatal death) in women

with diabetes are three to five times

greater than those of the background ma-

ternity population (1,2). It is therefore

recommended that all women of repro-

ductive age with diabetes are offered an-

nual preconception counseling and advised to avoid unplanned pregnancy (3). Prepreg-

nancy care is the targeted support and ad-

ditional clinical care offered to women

with type 1 diabetes, specialist prepreg-

nancy care improves glycemic control

and reduces adverse pregnancy outcomes

(4-11). Yet, despite documented benefits

in selected centers of excellence, only two

regional programs have been described,

both almost 20 years ago (4,11). Failure

to improve prepregnancy care provision

leaves a majority of women at increased

risk of potentially preventable poor preg-

nancy outcomes. This was confirmed by the

Confidential Enquiry for Maternal and

Child Health, revealing that only 17% of

U.K. maternity units offer prepregnancy

It is well established that for women

planning pregnancy.

(congenital malformation, still-

Clinical Care/Education/Nutrition/Psychosocial Research ORIGINAL ARTICLE

Effectiveness of a Regional Prepregnancy Care Program in Women With Type 1 and **Type 2 Diabetes**

Benefits beyond glycemic control

HELEN R. MURPHY, MD¹ JONATHAN M ROLAND, DM2 TIMOTHY C. SKINNER, PHD DAVID SIMMONS, MD⁴ ELEANOR GURNELL, MD⁵ NICHOLAS J. MORRISH, MD⁶

SHIU-CHING SOO, FRCP7 SUZANNAH KELLY, RM BOON LIM, FRCOG9 JOANNE RANDALL, FRCP¹⁰ SARAH THOMPSETT, RGN¹¹ ROSEMARY C. TEMPLE, FRCP¹²

OBJECTIVE — To implement and evaluate a regional prepregnancy care program in women with type 1 and type 2 diabetes.

RESEARCH DESIGN AND METHODS --- Prepregnancy care was promoted among patients and health professionals and delivered across 10 regional maternity units. A prospective cohort study of 680 pregnancies in women with type 1 and type 2 diabetes was performed. Primary outcomes were adverse pregnancy outcome (congenital malformation, stillbirth, or neonatal death), congenital malformation, and indicators of pregnancy preparation (5 mg folic acid, gestational age, and A1C). Comparisons were made with a historical cohort (n = 613pregnancies) from the same units during 1999-2004.

RESULTS — A total of 181 (27%) women attended, and 499 women (73%) did not attend prepregnancy care. Women with prepregnancy care presented earlier (6.7 vs. 7.7 weeks; P < 0.001), were more likely to take 5 mg preconception folic acid (88.2 vs. 26.7%; P < 0.0001) and had lower A1C levels (A1C 6.9 vs. 7.6%; P < 0.0001). They had fewer adverse pregnancy outcomes (1.3 vs. 7.8%; P = 0.009). Multivariate logistic regression confirmed that in addition to glycemic control, lack of prepregnancy care was independently associated with adverse outcome (odds ratio 0.2 [95% CI 0.05–0.89]; P = 0.03). Compared with 1999–2004, folic acid supplementation increased (40.7 vs. 32.5%; P = 0.006) and congenital malformations decreased (4.3 vs. 7.3%; P = 0.04).

CONCLUSIONS — Regional prepregnancy care was associated with improved pregnancy preparation and reduced risk of adverse pregnancy outcome in type 1 and type 2 diabetes. Prepregnancy care had benefits beyond improved glycemic control and was a stronger predictor ethnicity, or social disadvantage.

Pre-pregnancy care effective – Murphy HR Diab Care 2010

Diabetologia https://doi.org/10.1007/s00125-018-4613-3

ARTICLE

Community-based pre-pregnancy care programme improves pregnancy preparation in women with pregestational diabetes

CrossMark

Jennifer M. Yamamoto¹ • Deborah J. F. Hughes² • Mark L. Evans^{2,3} • Vithian Karunakaran⁴ • John D. A. Clark⁵ • Nicholas J. Morrish⁶ · Gerry A. Rayman⁷ · Peter H. Winocour⁸ · Clare Hambling⁹ · Amanda W. Harries¹⁰ · Michael J. Sampson^{10,11} · Helen R. Murphy^{2,10,11}

Received: 13 February 2018 / Accepted: 14 March 2018 C The Author(s) 2018

Abstract

Aims/hypothesis Women with diabetes remain at increased risk of adverse pregnancy outcomes associated with poor pregnancy preparation. However, women with type 2 diabetes are less aware of and less likely to access pre-pregnancy care (PPC) compared with women with type 1 diabetes. We developed and evaluated a community-based PPC programme with the aim of improving pregnancy preparation in all women with pregestational diabetes.

Methods This was a prospective cohort study comparing pregnancy preparation measures before and during/after the PPC intervention in women with pre-existing diabetes from 1 June 2013 to 28 February 2017. The setting was 422 primary care practices and ten National Health Service specialist antenatal diabetes clinics. A multifaceted approach was taken to engage women with diabetes and community healthcare teams. This included identifying and sending PPC information leaflets to all eligible women, electronic preconception care templates, online education modules and resources, and regional meetings and educational events. Key outcomes were preconception folic acid supplementation, maternal HbA_{1c} level, use of potentially harmful medications at conception and gestational age at first presentation, before and

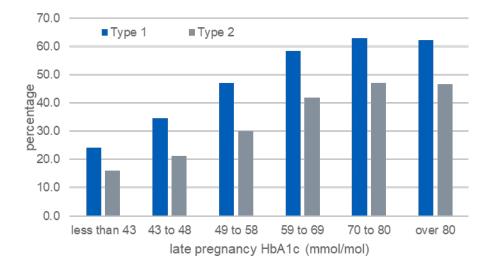
Results A total of 306 (73%) primary care practices actively participated in the PPC programme. Primary care databases were used to identify 5075 women with diabetes aged 18-45 years. PPC leaflets were provided to 4558 (89.8%) eligible women. There were 842 consecutive pregnancies in women with diabetes: 502 before and 340 during/after the PPC intervention. During/after the PPC intervention, pregnant women with type 2 diabetes were more likely to achieve target HbA1c levels ≤48 mmol/mol (6.5%) (44.4% of women before vs 58.5% of women during/after PPC intervention; p = 0.016) and to take 5 mg folic acid daily (23.5% and 41.8%; p = 0.001). There was

Community-based PPC effective – Yamamoto J Diabetologia 2018

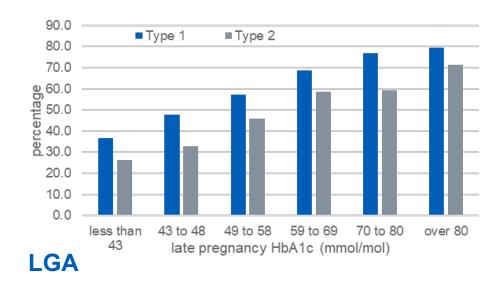
HbA1c during pregnancy

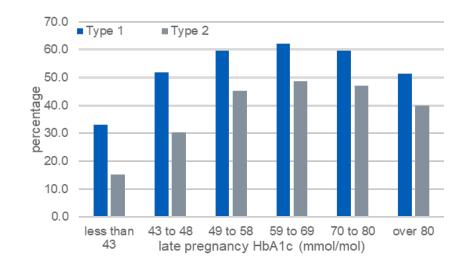
 Women with HbA_{1c} >43 mmol/mol after 24 weeks have significantly higher rates of preterm birth, LGA and NICU admission

Preterm delivery



Neonatal unit admission

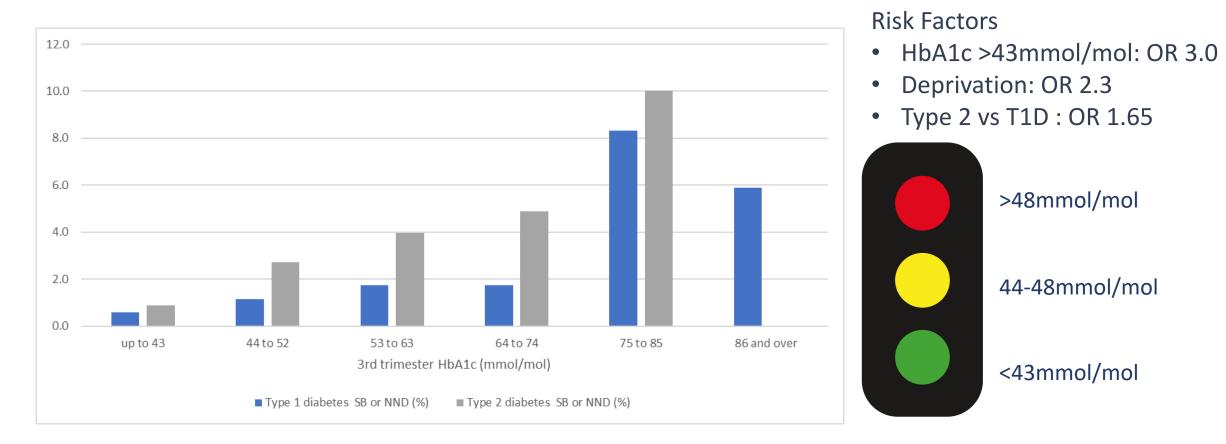




Perinatal deaths - Saving Babies Lives Care Bundle

Type 2: 200 deaths (110 stillbirths, 90 neonatal deaths)

Type 1: 145 (85 stillbirths, 60 neonatal deaths)



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

Missed opportunities before, between and after pregnancy?

- Median inter-pregnancy interval for women whose first pregnancy ended in adverse outcome : 1 year (IQR 0.4-2.1)
- Postnatal contraception should be prioritised



survey of UK practice and provision of car in pregnancies after stillbirth or neonatal death

T. A. Mills^{1,4*}, C. Ricklesford^{3,4}, A. E. P. Heazell^{2,3,4}, A. Cooke^{1,4} and T. Lavender^{1,4}

Women's experiences

Stigma and judgement; perceived and self....

'I felt frightened and not listened to'

'more focus on the positivity of managing glucose levels and the results for my pregnancy/birth, for example being able to deliver naturally – proper support to manage diabetes without compromising my mental health and unborn baby'

PROTECT expert by experience perspective

DIABETES UK KNOW DIABETES. FIGHT DIABETES.

T2Day press release

the option of new medicines and

treatments where indicated.

to help better manage

<u>NHS</u> offers extra help for under-40s with diabetes

Eleanor Hayward Health Correspondent

The NHS is to offer weight-loss programmes for under-40s with type 2 diabetes as a record number of younger adults develop the disease. In the UK, 148,000 people aged

between 18 to 39 have what medical orthodoxy has regarded as a condition of middle age. Cases of type 2 diabetes in under-40s

have risen faster in Britain than anywhere else in the world, increasing fivefold since 1990.

The new scheme is the first to target this group who are at high risk of deadly complications including kidney failure, heart attack and stroke.

Younger patients will be offered extra one-to-one reviews and support, plus the option of new weight-loss drugs. Treatments could include Ozempic, a weekly injection available on the NHS to treat type 2 diabetes. It is, however, in

short supply globally because of its offlabel use as a drug for the overweight. Patients will also have the option of a 12-week "soup and shakes" diet, which has been proven to put type 2 diabetes

into remission. Early-onset type 2 diabetes is a more aggressive form of the disease. Research shows that life expectancy falls by 11 years on average in those who develop it at 20, compared with a reduced life expectancy of two years when given a diagnosis at 65.

Professor Jonathan Valabhii national clinical director for diabetes and obesity said: "Type 2 diabetes in people under 40 is a growing problem globally. We know this age group is least likely to complete vital annual health checks. The programme will provide targeted intervention."

Chris Askew, chief executive of Diabetes UK, said the programme was a "vitally important" step to improving care for younger people with diabetes.

NHSI75

Under-40s with type 2 diabetes are set to have their care 'transformed' by a world-first NHS programme which gives patients tailored support

Patients will benefit from extra one-to-one reviews and option of new treatments

READ MORE: The four health measurements that EVERYONE should know



Home) News) Clinical areas) Diabetes) New NHS type 2 diabete

NHS to focus on diabetes checks for under 40s after 'alarming' rise in young people

World-first initiative will offer more intensive and targeted care under new national programme, officials announced

New NHS type 2 diabetes programme targets support at young people

NHS

People in England with diabetes to get targeted support in new roll-out

By Paul Gallagher HEALTH CORRESPONDENT

Tens of thousands of people in England living with early onset type 2 their diabetes. diabetes will benefit from more in-tensive and targeted care, thanks to it was the first health a world-first initiative being rolled out by the NHS. About 140,000 people aged 18 to

39 will receive extra tailored checks for this high-risk group. from health workers and support with diabetes, such as controlling blood sugar levels, managing weight and minimising cardiovascular risk. there will also be dedicated sup-Patients will also benefit from port available for women, including medication and in some cases put tious and world-first initiative."

140.000 Number of people system in the world to aged 18 to 39 who put in place a national. targeted programme Addressing the extra sugar levels risks associated with the condition during pregnancy, sugar levels, reduce diabetes-related

extra one-to-one reviews as well as access to contraception and folic their type 2 diabetes into remission. acid supplements. Professor Jonathan Valabhii, the Eligible individuals may national clinical director for diabealso he able to access the tes and obesity, said: "Type 2 diabetes in people under 40 is a growing NHS Type 2 Diabetes Path to Remission Proproblem globally. England is no exgramme - a year-long ception, meaning there is an everscheme including 12 increasing challenge for the NHS. "We know that this age group is weeks of low-calorie total diet replacement least likely to complete vital annual products and support health checks but we want to ensure to reintroduce food, people are able to manage their diawhich aims to help pabetes well and reduce the risk of seritients to improve their blood ous complications, which is exactly why we have embarked on an ambi-

National Diabetes Prevention Programme includes women with previous GDM

Healthier You NHS Diabetes Prevention Programme:

- The NHS DPP delivers evidence-based behavioural interventions to support people at high risk of Type 2 diabetes make sustainable lifestyle changes to reduce their risk
- Women with GDM and non-diabetic hyperglycaemia (NDH) were previously eligible
- Eligibility now expanded to include normoglycaemic women with prior GDM
- Establish CLEAR PATHWAYS between Maternity Services and General Practice to confirm normoglycaemia; (FPG < 5.5mmol/l / HbA1c < 42 mmol/mol)
 - The 6-8 week postnatal review ✓
 - Annual HbA1c check√



Take home messages

✓ Fantastic success T1D pregnancy from CGM and HCL

- ✓ EOT2D need targeted care and support including better access to safe effective contraception/ pre-pregnancy care (T2Day)
- ✓ Aim for HbA1c <43mmol/mol before & during T2D pregnancy
- ✓ Maternal glucose key modifiable risk factor role of CGM?
- ✓ Saving Babies Lives
- ✓ T2D prevention <40yrs = National Priority</p>
 - ✓ National GDM audit
 - ✓ Post-natal glucose/annual HbA1c
 - ✓ Diabetes Prevention & Remission



Prepared in collaboration with:







Supported by:



The National Diabetes Audit (NDA) is commissioned by the **Healthcare Quality Improvement Partnership (HQIP)** as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing, and National Voices. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage, and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies. www.hgip.org.uk/national-programmes

NHS Digital is the trading name for the Health and Social Care Information Centre (HSCIC). NHS Digital managed the publication of the 2020 report.

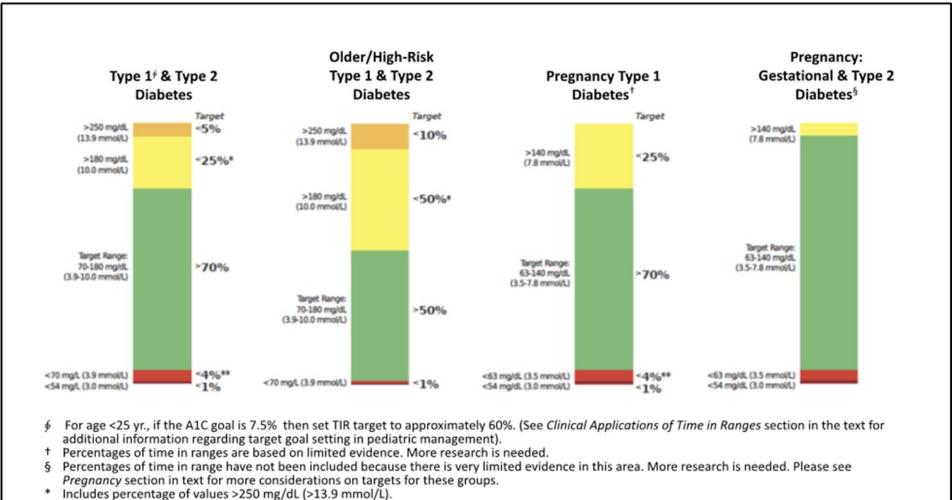
Diabetes UK is the charity leading the fight against the most devastating and fastest growing health crisis of our time, creating a world where diabetes can do no harm. They provide patient engagement and quality improvement services to the audit programme.

We are grateful to all the families that agreed to the inclusion of their baby's data in the National Neonatal Research Database (the NNRD) and the health professionals and neonatal units for contributing data and the Neonatal Data Analysis Unit team at Imperial College London.

Published by NHS Digital - Part of the Government Statistical Service https://digital.nhs.uk_0300 303 5678 or enquiries@nhsdigital.nhs.uk



Sensor glucose targets during T2D pregnancy



** Includes percentage of values <54 mg/dL (<3.0 mmol/L).