Congress Introduction

Congress Review

Review of the European Association for the Study of Diabetes (EASD) Annual Meeting 2026

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THE 62nd Annual Meeting of the European Association for the Study of Diabetes (EASD) took place in Milan, Italy, from 28th September–2nd October 2026. Against the backdrop of Milan's rich cultural heritage and thriving scientific community, the meeting brought together researchers, clinicians, policymakers, and industry experts from across the globe in an atmosphere of discovery and collaboration.

The meeting opened with palpable energy as Francesco Giorgino, President of EASD, delivered his inaugural Presidential Address, warmly welcoming more than 16,000 participants from over 100 countries. The address set the tone for a congress built on international scientific exchange and collaboration.

The scientific programme reflected this collaborative spirit, featuring a record 1,418 abstracts spanning basic, translational, and clinical science. Several interconnected themes emerged across the meeting, each pointing towards a more integrated and personalised approach to diabetes prevention and care.

A central focus was the interplay between the cardiovascular, kidney, liver, and metabolic systems, and the need to move beyond a glucose-centric view of diabetes. Precision medicine featured prominently, reflecting a broader shift towards treatment tailored to the clinical characteristics and needs of each person living with diabetes.

Early intervention was another recurring theme. An update to the American Diabetes Association (ADA)/EASD consensus report on the management of Type 2 diabetes encouraged the earlier use of glucagon-like peptide-1 (GLP-1)-based therapies and sodium-glucose cotransporter 2 (SGLT2) inhibitors, reinforcing a treatment paradigm increasingly shaped by the individual's overall cardiometabolic profile rather than by glycaemic control alone.

Technology represented another key part of the programme, with advances in continuous glucose monitoring, automated insulin delivery, and digital health showcased alongside a growing discussion of AI and its potential role in diabetes education, clinical decision-making, and self-management. The focus extended beyond innovation itself to how these tools can be integrated into everyday clinical practice to support people living with diabetes.

Guidelines took centre stage. The meeting saw the presentation and subsequent publication of EASD's first clinical practice guideline on the use of continuous glucose monitoring in Type 2 diabetes, which marked an important step in extending diabetes technology beyond traditional populations. A new EASD clinical practice guideline on the management of diabetes distress was also released. Together, these guidelines emphasise the importance of addressing both the clinical and psychological dimensions of diabetes, while translating evidence into practical recommendations for healthcare professionals.

Attendees were also able to explore new clinical trial data, notably from RESET for Remission, ACHIEVE-4, and COURAGE. These studies spanned remission, therapeutic strategy, and long-term outcomes, and they underscored EASD's role as a platform for research that drives better outcomes.

In his closing remarks, Giorgino thanked the EASD Executive Board and the wider community for a collaborative and exciting congress, and looked ahead to reuniting in Budapest, Hungary, for EASD 2027. He then introduced one of the most highly anticipated sessions of the meeting: the 58th Claude Bernard Lecture, delivered by Anette-Gabriele Ziegler, Helmholtz Munich, Oberschleißheim, Germany. Ziegler made a compelling case for shifting the clinical approach to Type 1 diabetes away from treating late-stage, established disease and towards early detection, staged disease identification, and disease-modifying prevention. Her forward-looking perspective was a fitting close to a meeting focused on advancing diabetes science and on turning those advances into meaningful improvements in care.



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Should Pulmonary Function Testing Be Routine in Type 2 Diabetes?

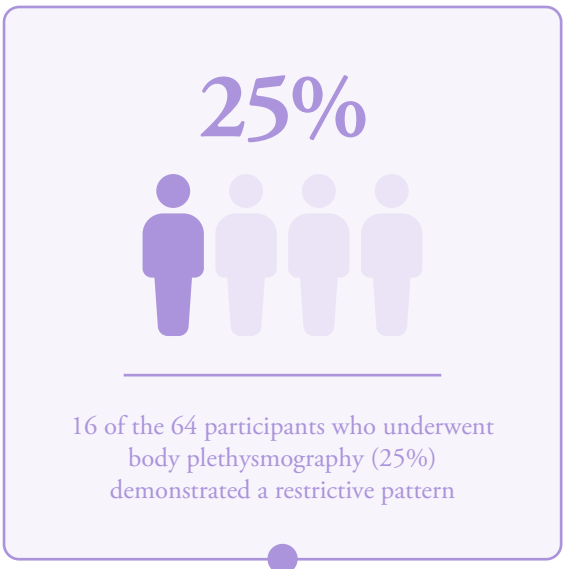
A STUDY presented at EASD 2026 investigated pulmonary function abnormalities and their relationship with glycaemic control in patients with Type 2 diabetes (T2D) in India.[1]

T2D is associated with established microvascular complications, including neuropathy, retinopathy, and nephropathy. However, pulmonary involvement remains under-recognised, partly because lung function testing is not routinely incorporated into diabetes care. Respiratory abnormalities may therefore remain undetected until clinically significant symptoms develop. Understanding the prevalence and pattern of pulmonary dysfunction could support earlier identification and inform clinical monitoring.

This cross-sectional observational study was conducted between April 2024–July 2025 and included 101 patients with T2D (71 male, 30 female), aged 18–60 years (mean: 46.75±8.07 years). Patients with pre-existing pulmonary disease, hypertension, or a history of chronic smoking were excluded. Spirometry was performed in all 101 participants to assess forced expiratory volume in one second (FEV_1), forced vital capacity (FVC), and the FEV_1/FVC ratio. Body plethysmography was undertaken in 64 participants to measure total lung capacity (TLC). Restriction was defined as TLC below 80% of the predicted value, while obstruction was assessed using the study's specified FEV_1/FVC threshold.

Spirometric measurements varied across participants, with reported FEV_1 values of 1.86–2.85 litres, predicted FVC values of 72.00–94.25%, and FEV_1/FVC ratios of 79.08–87.80. Only one participant met the diagnostic criterion for obstructive lung disease. In contrast, 16 of the 64 participants who underwent body plethysmography (25%) demonstrated a restrictive pattern. The relationship between TLC and glycaemic parameters showed a weak negative correlation that was not statistically significant, suggesting no clear evidence of an association in this sample.

These findings suggest that restrictive pulmonary abnormalities may be more prominent than obstructive changes among selected patients with T2D. Incorporating targeted pulmonary function assessment into clinical reviews could help identify otherwise unrecognised impairment and support appropriate investigation and follow-up. However, routine testing for all patients cannot be justified by this study alone. Limitations include the cross-sectional design, which precludes causal conclusions, the single study population, exclusion criteria that limit generalisability, and plethysmography data being available for only 64 of 101 participants. Larger, longitudinal studies are needed to confirm prevalence, clarify associations with glycaemic control, and establish the clinical value of routine screening.



Gestational Diabetes Recall Register Supports Long-Term Screening

WOMEN with a history of gestational diabetes (GDM) benefited from a long-term recall register designed to encourage postpartum diabetes screening, according to a 16-year evaluation in Northern Belgium. The findings, presented at EASD 2026, highlighted the feasibility of routine reminder systems and the substantial risk of developing diabetes and impaired fasting glucose among this population.[2]

Researchers evaluated the Sweet Pregnancy GDM recall register, implemented in Northern Belgium between 2009–2025, to assess its feasibility and effectiveness in encouraging screening for prediabetes and diabetes after pregnancy. Women with previous GDM received annual reminders to undergo fasting plasma glucose testing in primary care.

The register included 27,173 women after 16 years of operation, with a mean registration follow-up of 4.4 years. The median age was 31.8 years, while 28.5% of participants were overweight and 28.1% had obesity. The findings demonstrated the potential of a large-scale register embedded in routine care to support ongoing diabetes surveillance in women at increased risk of developing Type 2 diabetes. Annual response rates declined over time, falling from 48.4% in the first year to 27.6% in the tenth year. However, among women who responded, reported screening uptake increased from 74.6% to 91.0% over the same period.

Among responders followed for at least 3 and 5 years, respectively, 70.7% and 66.8% had undergone at least one screening test through a general practitioner. These findings suggested that sustained engagement with the register could help maintain screening participation beyond the immediate postpartum period.

Reminder delivery method was also associated with response rates. After 1 year, email reminders achieved a response rate of 44.3%, compared with 19.8% for postal reminders. Despite this difference, screening uptake among responders was similar between the two methods, at 84.7% and 84.2%, respectively.

Non-responders were more likely to be younger than 30 years and to have obesity. These findings identified groups that may require additional efforts to encourage participation in follow-up screening. After 10 years, the cumulative incidence of diabetes reached 11.0% (95% CI: 10.1–12.0), while impaired fasting glucose reached 34.7% (95% CI: 33.1–36.4).

The results underscored the importance of long-term diabetes screening following GDM. Although response rates decreased over time, the register provided a practical framework for encouraging surveillance in routine care. The higher response associated with email reminders also highlighted the potential value of digital communication. Continued follow-up and targeted preventive interventions may be important to address the substantial burden of dysglycaemia in women with previous GDM and reduce progression to Type 2 diabetes.



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Cardiorenal Complications Common After Type 2 Diabetes Diagnosis

ALMOST one-third of patients newly diagnosed with Type 2 diabetes (T2D) developed chronic kidney disease (CKD), heart failure (HF), or died within 5 years, with the proportion increasing to more than half at 10 years, according to findings presented at EASD 2026.[3]

Within 5 years of T2D diagnosis, the estimated risk of developing CKD first was 19.0%, compared with 8.3% for HF first

The analysis also highlighted substantial risks of developing a second cardiorenal complication after the first.

Although CKD and HF are recognised complications of T2D, their sequence of development following diagnosis remains incompletely understood. Naveed Sattar, University of Glasgow, UK, and colleagues investigated these trajectories within the observational CALOR study programme.

The retrospective analysis included 1,617,508 adults with newly diagnosed T2D identified in the US Optum Clinformatics Data Mart Database between January 2010–March 2024. The mean age was 59.3 years, and 51.3% were female. Diagnosed dyslipidaemia and hypertension were present in 72.2% and 68.4%, respectively. Median BMI was 30.9 kg/m², although BMI data were available for only 12.8% of participants.

Researchers used a semi-Markov multi-state model within a competing risk framework to estimate the likelihood of developing CKD or HF first, followed by the alternate complication. CKD was identified using diagnosis codes or estimated glomerular filtration rate criteria, while HF was identified using diagnosis codes. The composite risk of CKD, HF, or death was assessed using Kaplan–Meier analysis.

Within 5 years of T2D diagnosis, the estimated risk of developing CKD first was 19.0%, compared with 8.3% for HF first.

Following an initial CKD diagnosis, the risk of developing HF over the subsequent 5 years was 22.7%. Conversely, patients who developed HF first had a 42.0% risk of developing CKD within the following 5 years.

The estimated composite risk of CKD, HF, or death was 32.9% at 5 years and 55.1% at 10 years after T2D diagnosis. These findings demonstrate the considerable burden of cardiorenal complications and mortality from the early years of T2D, with particularly high subsequent kidney disease risk among patients who develop HF.

The authors emphasised the need for early, proactive, and comprehensive management following T2D diagnosis. However, these observational findings describe disease trajectories rather than causal relationships, and their applicability beyond the USA population remains to be established. Inclusion of the UK and Japanese data in the CALOR programme is ongoing.

> **These findings demonstrate the considerable burden of cardiorenal complications and mortality from the early years of T2D**



> **Higher TIR and lower mean glucose, measured via CGM, are strongly associated with lower complication risk**

Using Continuous Glucose Monitoring to Predict Vascular Complications in Type 1 Diabetes

HIGHER time in range (TIR) and lower mean glucose measured via continuous glucose monitoring (CGM) have been linked to a lower risk of micro- and macrovascular complications in Type 1 diabetes, according to research presented at EASD 2026.[4]

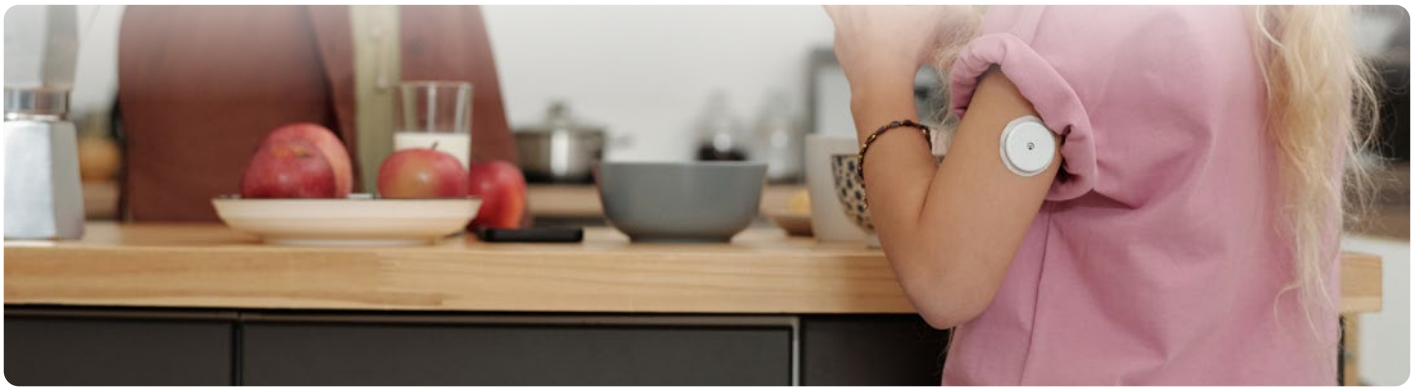
CGM has become central to assessing glucose control in Type 1 diabetes, but evidence on how CGM-derived measures relate to long-term complications has been limited in large, population-based cohorts. HbA1c has traditionally served as the reference marker, whereas CGM also yields TIR, mean glucose, glucose coefficient of variation, and time below range (TBR), the prognostic value of which is still being established.

The analysis drew on the Swedish National Diabetes Register, covering children and adults with Type 1 diabetes who had a CGM measurement between 17 May 2018–31 December 2024, with follow-up to 31 December 2025. Time-updated mean values of TIR, mean glucose, glucose coefficient of variation, TBR, and HbA1c were entered into Cox proportional hazards models, with incident retinopathy, albuminuria, amputation, and cardiovascular disease as the outcomes. Models accounted for age, sex, index year, diabetes duration, smoking status, BMI, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, estimated glomerular filtration rate, and blood pressure, and TBR models also accounted for mean glucose. People with a prior event for the relevant outcome were excluded.

Depending on the outcome, the cohorts contained 17,186–47,613 participants, who were followed for a mean of 4.1–4.7 years. Every CGM metric showed strong and consistent associations with micro- and macrovascular complications, of similar magnitude to those observed for HbA1c, and higher TBR was consistently associated with greater risk.

The findings suggest that higher TIR and lower mean glucose, measured via CGM, are strongly associated with lower complication risk, which supports their use in routine care and as potential surrogate endpoints in clinical trials. The consistent link between TBR and complications also points to the value of limiting hypoglycaemia in people with Type 1 diabetes. Interventional studies are needed to establish whether improving these measures reduces complications.

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Glycaemic Variability Predicts Disease Progression in Type 1 Diabetes

CONTINUOUS glucose monitoring (CGM) variability metrics are able to predict progression to Stage 3 Type 1 diabetes (T1D) independently of HbA1c measurements, according to a new prospective study presented at EASD 2026.[5]

Researchers reported that the findings may have implications for improving personalised risk stratification for patients with early T1D.

There are challenges associated with monitoring progression to Stage 3 T1D. Oral glucose tolerance tests are currently used for monitoring progression but can be challenging to implement in clinical practice. Although HbA1c is also used, it lacks sufficient sensitivity to reliably detect early progression when used in isolation, particularly in young children.

Researchers included 165 participants from the ASK and DAISY studies, using longitudinal CGM and HbA1c data to investigate associations with time to progression to Stage 3 T1D. Bayesian joint models were used to assess glucose metrics, including mean glucose, glucose standard deviation, glucose coefficient of variation, and time spent above 140 mg/dL.

The results showed that all CGM metrics and HbA1c were significantly associated with time to progression to Stage 3 T1D ($p<0.001$). HbA1c demonstrated the best model fit, with a hazard ratio (HR) of 3.53 (95% CI: 2.29–5.76) per standard deviation, while glucose coefficient of variation (CV) had the greatest effect size (HR: 4.43; 95% CI: 2.64–8.93).

When HbA1c and glucose CV were assessed together, both remained significantly associated with progression ($p=0.008$ and $p<0.001$, respectively). Glucose CV had a higher HR of 3.19 (95% CI: 1.78–6.99), compared with 1.98 (95% CI: 1.19–3.44) for HbA1c. A separate combined model found that HbA1c ($p=0.017$) and time spent above 140 mg/dL (TAR140; $p=0.003$) were also significantly associated with progression.

The addition of CGM metrics improved predictive performance. The area under the curve was 0.62 for HbA1c alone, increasing to 0.71 when combined with TAR140 and 0.74 when combined with glucose CV. Of the 165 participants, 32% progressed to Stage 3 T1D during a median follow-up of 1.4 years.

The findings suggest that CGM variability metrics could help identify individuals at increased risk of progressing to Stage 3 T1D independently of HbA1c. The authors recommended integrating these metrics into standard monitoring protocols. Combining CGM measurements with HbA1c may also support more personalised risk prediction and improve the assessment of disease progression in individuals with early-stage T1D.

Metformin Use Linked to Pregnancy Outcomes in Gestational Diabetes

METFORMIN treatment for gestational diabetes mellitus (GDM) was associated with lower odds of several adverse neonatal and pregnancy outcomes compared with insulin monotherapy in a population-based cohort study, according to research presented at EASD 2026.[6]

Metformin is increasingly used off-label to manage GDM, prompting interest in its real-world pregnancy outcomes, particularly because it crosses the placenta and previous trial data have raised questions about preterm delivery risk. This study, carried out in Alberta, Canada, assessed maternal and neonatal outcomes among pregnancies affected by GDM requiring glucose-lowering medication.

Researchers retrospectively analysed 17,248 singleton pregnancies between January 2013–December 2024. Of these, 14,785 received insulin monotherapy, 1,738 received metformin monotherapy, and 725 received both treatments. Multivariable logistic regression adjusted for maternal demographics, socioeconomic markers, parity, and pre-existing comorbidities.

Compared with insulin monotherapy, metformin was associated with lower odds of neonatal hypoglycaemia (odds ratio [OR]: 0.81; 95% CI: 0.69–0.95), caesarean delivery (OR: 0.81; 95% CI: 0.74–0.90), and large for gestational age (OR: 0.76; 95% CI: 0.65–0.89). Lower odds of respiratory distress syndrome were also reported (OR: 0.63; 95% CI: 0.39–1.00). No statistically significant associations were found with preterm birth, small for gestational age, or neonatal jaundice in the primary analysis.

A sensitivity analysis incorporating BMI for 2023–2024 found lower odds of preterm birth with metformin (OR: 0.68; 95% CI: 0.47–0.99). However, associations with large-for-gestational-age birth and respiratory distress syndrome were no longer statistically significant in this subgroup analysis.

The retrospective observational design means the results cannot establish causality, and residual confounding or differences in treatment selection may have influenced the findings. The authors concluded that metformin was not associated with increased odds of the examined adverse outcomes. Further research is needed to clarify treatment selection and assess long-term maternal and offspring outcomes.

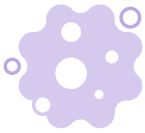


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Younger-Onset Type 2 Diabetes Linked to Higher Relative Cancer Risk

YOUNGER age at Type 2 diabetes diagnosis is associated with a greater relative risk of developing cancer, according to a nationwide Korean cohort study presented at EASD 2026.[7] Although older adults had the highest absolute cancer incidence, those diagnosed with diabetes between 20–54 years showed the greatest excess risk compared with age- and sex-specific population expectations.



Adults diagnosed between 20–54 years had the highest standardised incidence ratio, at 4.17, despite having the lowest absolute cancer incidence

Researchers examined how age at diabetes onset related to subsequent cancer incidence using the Korean National Health Insurance Service database. Adults newly diagnosed with Type 2 diabetes between 2011–2013 were identified, and the analytic cohort included 252,106 individuals following exclusions and 1:3 propensity score matching on demographic, metabolic, lifestyle, and clinical factors. Participants were followed for a median of 11.36 years.

The study assessed both absolute and relative cancer risks. Age-standardised rates were calculated using the Korean standard population, while standardised incidence ratios compared observed cancer cases with the number expected from national registry data for people of the same age and sex.

During follow-up, 15,353 cancers were recorded in the diabetes cohort. The overall age-standardised cancer incidence rate was 1,503 per 100,000, and the standardised incidence ratio was 2.29 (95% CI: 2.25–2.33), indicating more than twice the expected number of cancers.

Age at diabetes onset showed a strong inverse association with relative cancer risk. Adults diagnosed between 20–54 years had the highest standardised incidence ratio, at 4.17, despite having the lowest absolute cancer incidence. Conversely, those diagnosed at 75 years or older had the highest age-standardised incidence rate, at 3,211 per 100,000, but a lower standardised incidence ratio of 1.72 (95% CI: 1.63–1.80).

Relative cancer risk was also higher in men than women, with standardised incidence ratios of 2.42 and 2.10, respectively. Risks varied substantially by cancer site, with pancreatic cancer showing the highest standardised incidence ratios in both men (8.57) and women (9.84).

The findings highlight the distinction between absolute and relative risk: older adults with diabetes experienced more cancers overall, while younger-onset diabetes was associated with a greater increase in cancer incidence compared with that expected for individuals of the same age and sex. Age at diabetes diagnosis may therefore provide useful information when assessing subsequent cancer risk.

Daily Cold Exposure and Body Composition in Overweight and Obesity

ADULTS who are overweight or have obesity who completed 6 weeks of daily cold exposure have shown greater reductions in body fat mass than controls, according to a randomised trial presented at EASD 2026.[8]

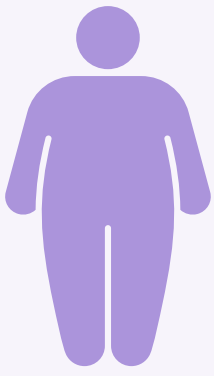
Cold exposure has emerged as a potential lifestyle strategy for reducing obesity, with proposed effects on fat accumulation through increased energy expenditure via brown adipose tissue activation or skeletal muscle contraction. Earlier studies enrolled lean participants or tested short interventions, so the effects of longer-term exposure in people with overweight or obesity remained unclear.

Cold exposure has emerged as a potential lifestyle strategy for reducing obesity, with proposed effects on fat accumulation through increased energy expenditure

This randomised trial allocated 47 adults who were overweight or had obesity (BMI: 25–35 kg/m²) to a cold exposure arm (n=24) or a control arm (n=23). The cold exposure arm wore a cooling vest and waist wrap with 15 °C phase-change material cooling pads for 2 hours each morning for 6 weeks, and rated cold perception and thermal comfort daily. Before and after the intervention, researchers measured body composition (bioimpedance), hepatic steatosis (FibroScan®, Echosens SA, Paris, France), resting energy expenditure at 27 °C and during acute cold exposure at 11 °C, fasted serum glucose and lipid markers, leukocyte count, and lipopolysaccharide-induced cytokine release.

Repeated cold exposure improved thermal comfort (p=0.020) and reduced cold perception (p=0.025). Compared with controls, cold exposure was associated with lower body weight (difference: -1.6±0.4 kg; p<0.001) and BMI (difference: -0.5±0.1 kg/m²; p<0.001), attributed to reduced body fat mass (difference: -1.5±0.5 kg; p=0.007), while fat-free mass was unchanged (difference: -0.1±0.5 kg; p=0.860). Acute cold exposure enhanced cold-induced carbohydrate oxidation (difference: 0.005±0.002 g/min; p=0.019) and tended to increase cold-induced resting energy expenditure (difference: 142±74 kcal/day; p=0.058) in that arm only. Hepatic steatosis, glucose and lipid markers, leukocyte composition, and cytokine release did not change.

These data indicate that 6 weeks of daily cold exposure can lower body weight in adults with overweight or obesity, primarily through reduced body fat mass, although hepatic steatosis and metabolic and inflammatory markers did not change. The modest fat mass reduction may explain this, and longer trials could clarify any wider metabolic benefit.



This randomised trial allocated 47 adults who were overweight or had obesity (BMI: 25–35 kg/m²) to a cold exposure arm (n=24) or a control arm (n=23)

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Eating Behaviour Predicts Weight Loss with GLP-1-Based Therapies

BASELINE eating behaviour may help predict weight loss in adults receiving semaglutide or tirzepatide for obesity, according to interim findings from the BITE cohort study presented at EASD 2026. Participants reporting more dysregulated eating behaviours before treatment experienced greater weight loss, suggesting that assessing eating patterns could help inform personalised obesity management.[9]

The ongoing, prospective, single-centre observational study assessed whether eating behaviour predicted changes in body weight during treatment. Researchers used the Eating Behavior Assessment for Obesity (EBA-O), a validated screening questionnaire, with higher scores indicating more dysregulated eating behaviours.

Adults starting semaglutide or tirzepatide were eligible if they had a BMI of at least 30 kg/m², or at least 27 kg/m² with comorbidities. People with Type 2 diabetes, previous bariatric surgery, or contraindications to incretin-based therapies were excluded. Clinical measurements and questionnaire responses were collected at baseline, with follow-up visits scheduled every 3 months for up to 12 months. Body weight was also assessed after 1 month.

Of 203 patients screened, 100 were included, and 47 had completed the 3-month follow-up at the time of analysis. Women accounted for 74.5% of participants, the mean age was 45.2 years, and the mean baseline BMI was 37.4 kg/m². Treatment allocation was approximately evenly divided between tirzepatide (51%) and semaglutide (49%).

At 3 months, participants had lost an average of 3.9 kg ($p<0.001$). Higher baseline EBA-O scores were independently associated with greater weight loss after adjustment for age, sex, baseline body weight, and treatment ($p=0.036$). In the longitudinal analysis, each additional point on the baseline questionnaire was associated with a steeper decline in body weight over time (β=−0.34 kg; 95% CI: -0.59–-0.10; $p<0.001$).

These findings suggest that pretreatment eating behaviour may help explain some of the variation in weight loss responses to semaglutide and tirzepatide. Incorporating a structured assessment of eating patterns into obesity care could help clinicians better understand likely treatment responses and support more individualised management.

However, the findings are preliminary, with 3-month follow-up available for fewer than half of the included participants. The observational, single-centre design limits conclusions about causality and applicability to wider populations. Longer follow-up will be needed to establish whether the associations persist throughout treatment.





Liver Collagen Content Linked to Hepatic Insulin Resistance

LIVER collagen content may be associated with impaired hepatic glucose regulation, according to research presented at EASD 2026, investigating the relationship between liver fibrosis, protein expression, and insulin resistance.[10]

> **Hepatic collagen accumulation and coagulation factors are associated with changes in pathways governing glucose production, glycogen breakdown, and glucose uptake**

The study examined liver tissue from adults with a wide range of BMI and glycaemic control, identifying associations between collagen accumulation, glucose metabolism-related proteins, and measures of hepatic insulin sensitivity.

Hepatic insulin resistance has been linked to the development of liver fibrosis, but the protein-level changes underlying this relationship remain incompletely understood in humans. To investigate potential mechanisms, researchers assessed hepatic collagen content and coagulation factors alongside proteins involved in glucose metabolism. Understanding these associations could help clarify how structural changes in the liver relate to altered glucose regulation.

The study included 71 adults, comprising 60 women and 11 men, with a median BMI of 39.7 kg/m² and a median age of 46.8 years. Liver tissue was collected during metabolic bariatric surgery or abdominal surgery for benign conditions. Untargeted proteomic analysis was performed using data-independent acquisition mass spectrometry. In subsets of participants, hepatic insulin resistance was assessed by measuring endogenous glucose production and liver glucose uptake during a hyperinsulinaemic-euglycaemic clamp combined with [18F]FDG-PET. Oral glucose tolerance testing and additional measures of insulin resistance were also evaluated.

Higher hepatic collagen content was associated with increased endogenous glucose production during the clamp procedure and higher blood glucose levels 120 minutes after an oral glucose tolerance test. However, associations with HOMA-IR and M value, measures of insulin resistance, could not be established. At the protein level, greater collagen content was associated with higher levels of glycogen phosphorylase, phosphoenolpyruvate carboxykinase, and pyruvate carboxylase, alongside lower levels of glucokinase. Hepatic coagulation factors showed a similar association pattern, while higher coagulation factor content was associated with lower levels of CEACAM1, a protein involved in insulin clearance.

The findings suggest that hepatic collagen accumulation and coagulation factors are associated with changes in pathways governing glucose production, glycogen breakdown, and glucose uptake. However, the observational findings do not establish causality, and the smaller subsets used for some metabolic measurements warrant consideration. Further research could clarify whether these protein-level changes contribute to hepatic insulin resistance and whether they may help identify individuals at risk of metabolic liver complications.

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References

1. Mehta B et al. Exploring the hidden disease burden of pulmonary dysfunction in Type 2 diabetes. Abstract 221. EASD Annual Meeting, 28 September-2 October, 2026.
2. Bochanen N et al. Long-term effectiveness of a reminder system to stimulate postpartum screening for glucose intolerance in women with gestational diabetes: the "Sweet Pregnancy" Project. Abstract 6. EASD Annual Meeting, 28 September-2 October, 2026.
3. Sattar N et al. Cardiorenal disease trajectories in patients newly diagnosed with type 2 diabetes. Abstract 32. EASD Annual Meeting, 28 September-2 October, 2026.
4. Fatulla P et al. Association of CGM metrics with future risk of micro- and macrovascular complications in type 1 diabetes. Abstract 55. EASD Annual Meeting, 28 September-2 October, 2026.
5. Pyle L et al. Glycaemic variability predicts progression to stage 3 type 1 diabetes independent of HbA1c. Abstract 60. EASD Annual Meeting, 28 September-2 October, 2026.
6. Butalia S et al. Impact of metformin in gestational diabetes: real-world evidence from a population-based cohort study. Abstract LBA 07. EASD Annual Meeting, 28 September-2 October, 2026.
7. Seo D et al. Impact of age at type 2 diabetes onset on absolute and relative cancer risks: a nationwide cohort study. Abstract 1200. EASD Annual Meeting, 28 September–2 October, 2026.
8. Boon MR et al. Daily cold exposure during 6 weeks reduces fat mass in males and females with overweight or obesity. Abstract 682. EASD Congress, 28 September-2 October, 2026.
9. Caruso I et al. Eating behaviour as a predictor of weight loss response to GLP-1RA-based therapies: the BITE cohort study. Abstract 784. EASD Annual Meeting, 28 September-2 October, 2026.
10. Honka MJ et al. Liver collagen content associates with hepatic insulin resistance. Abstract 550. EASD Congress, 28 September-2 October, 2026.