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- The abstracts in this supplement have been edited minimally from the submitted versions, primarily for house style on units.
- For full authorship details, please refer to the posters.
- Funding declarations are presented only where explicitly supplied with the abstracts. For full details, please refer to the posters.

P1

Outcomes of a digitally delivered low-carbohydrate type 2 diabetes self-management program: 1-year results of a single-arm longitudinal study

Submitting author: ***Summers C****, Diabetes Digital Media, University of Warwick Science Park, UK*

Background: Type 2 diabetes mellitus has serious health consequences and its annual global costs are more than US $800 billion. **Objectives:** Evaluate the 1-year outcomes of the digitally delivered Low-Carb Program, a nutritionally focused, 10-session educational intervention for glycaemic control and weight loss for adults with type 2 diabetes. **Methods:** The study used a quasi-experimental research design comprised of an open-label, single-arm, pre-post intervention using a sample of convenience. From adults with type 2 diabetes who had joined the program and had a complete baseline dataset, we randomly selected participants to be followed for 1 year (n=1000; mean age 56.1 years [SD 15.7 years]; 59.30% [593/1000[women; mean glycated haemoglobin A1c [HbA_{1c}] 7.8% [SD 2.1%]; mean body weight 89.6 kg]SD 23.1 kg]; taking mean 1.2 [SD 1.01] diabetes medications). **Results:** Of 1000 study participants, 708 (70.80%) individuals reported outcomes at 12 months, 672 (67.20%) completed at least 40% of the lessons, and 528 (52.80%) completed all lessons of the program. Of the 743 participants with a starting HbA_{1c} at or above the type 2 diabetes threshold of 6.5%, 195 (26.2%) reduced their HbA_{1c} to below the threshold while taking no glucose-lowering medications or just metformin. Of the participants who were taking at least one hypoglycaemic medication at baseline, 40.4% (289/714) reduced one or more of these medications. **Conclusions:** Especially for participants who fully engage, an online program that teaches a carbohydrate-reduced diet to adults with type 2 diabetes can be effective for glycaemic control, weight loss, and reducing hypoglycaemic medications. ■

P2

Enhancing diabetes care in care homes across Buckinghamshire

Submitting authors: ***Dunn G and Kent J****, Buckinghamshire CCG, UK*

Background: In Buckinghamshire, we identified many residents who were at risk from poor diabetes management, and we wanted to tackle the challenge of up-skilling the care and nursing home workforce to enable them to meet the needs of our frail older residents who are living with diabetes. **Aims:** To provide guidance and up-skill staff to change their practice and safely manage patients with diabetes. **Methods:** We produced a "Best Practice Guidance for Residents Living with Diabetes in Care Homes" and put together a programme of education based on the delivery of the main standards of care included in the guideline. Nine days were organised and by identifying a "Diabetes Champion" to attend from each care home. It was hoped they could disseminate the learnings to other staff. 182 attendees from 50 homes attended. In order to measure an improvement in attendee's confidence and competence, a survey was completed on arrival and again at the end of the course. After 2 months, 9 of the attendees participated in a telephone interview to discuss their experiences, learnings and impact of their learning. **Results:** Development of diabetes care standards: Improved safety for patients and staff in relation to blood glucose monitoring; Change of practice, especially regarding foot care, nutrition, dementia awareness and hypoglycaemia management; Improvement in knowledge and confidence of diabetes management. **Conclusion:** Investment in education and training provision can improve the quality of diabetes management and safety within care homes. ■

P3

Safe and effective prescription of metformin in elderly patients with type 2 diabetes (T2DM)

Submitting author: ***Ozturk S****, St Luke's Health Centre, Southend-on-Sea, UK*

Background and aim: Metformin is the first-line recommendation in T2DM treatment in all of the most recent guidelines, including NICE, ADA and EASD. It is the commonest prescribed antidiabetes drug locally, a search in the local GP clinic showed that 85% of elderly patients (over 70 years) with T2DM are on metformin. The aim of this study was to determine the side-effect profile of metformin in elderly patients. **Methods:** Three patient cases encountered in the local GP clinic were retrospectively reviewed and a review of the literature was performed. **Results:** Elderly patients with diabetes should have special consideration when it comes to prescribing. This is particularly the case when comorbidities, such as malnutrition or chronic renal failure, are present and require close surveillance. Lactic acidosis, albeit rare, can be fatal and patients at risk should be closely monitored. Recurrent hypoglycaemia can occur and should be suspected when cognitive or physical health deteriorates. Vitamin B12 deficiency can occur and where there is cognitive decline this should be considered. Gastrointestinal side effects are common and a slow-release metformin can be used to try and alleviate symptoms. **Conclusions:** Metformin is likely to remain first-line recommended drug in T2DM for the foreseeable future. It is considered safe in the elderly but clinicians should remain alert for the potential for side effects when vague symptoms arise. Sick-day rules are important to educate patients and carers about the potential for insidious side effects. ■

P4

Predicting type 2 diabetes development among patients in general practice – a prospective analysis comparing metabolic syndrome definitions and components

Submitting author: ***Millar S****, University College Cork, Ireland*

Background and objectives: A definition of metabolic syndrome (MetS) has been recommended as a tool to help identify individuals at risk of developing type 2 diabetes. However, an agreed protocol for defining MetS does not exist and some studies have shown MetS definitions to be inferior at predicting diabetes compared to a single measurement of fasting glucose. In this study, we examined the ability of five proposed MetS definitions to discriminate incident cases in order to determine whether MetS more accurately predicts type 2 diabetes. **Materials and methods:** This was a prospective study involving a random sample of 1754 men and women aged 46–73 years. Receiver operating characteristic curve and net reclassification improvement (NRI) analyses were used to evaluate the ability of MetS definitions and components to accurately classify high-risk subjects. **Results:** A model including proposed MetS components displayed a significantly (P=0.02) higher area under the curve (AUC) to discriminate diabetes (AUC=0.90; 95% CI, 0.87–0.93) compared to fasting glucose (AUC=0.88; 95% CI, 0.83–0.92). Models using the European Group for the Study of Insulin Resistance MetS criterion, and which included glucose as a mandatory component, demonstrated significant overall NRI when compared to recommended and optimal fasting glucose cut-offs. A final model had a sensitivity of 0.91 and a specificity of 0.73. **Conclusions:** In this population, there is evidence that a combination of MetS components may help predict diabetes beyond that which is measured by glucose alone. Proposed MetS definitions should include fasting glucose as a mandatory component. ■

P5

What are the effects of physical activity in people with pre-diabetes for reducing the blood-glucose levels and cardiovascular risk?

Submitting author: ***Foster S****, Buckinghamshire Healthcare NHS Trust, Aylesbury, UK*

Background: Pre-diabetes is related to people with impaired fasting glucose, impaired glucose tolerance (IGT) or a combination of both. It is associated with increased risk of cardiovascular disease. Lifestyle changes had been suggested to reduce diabetes from developing. Physical activity is a key element in diabetes prevention. **Aims:** The types of physical activity, without dietary changes affecting weight loss, were evaluated on the effects of reducing the blood-glucose levels and cardiovascular risks. **Objectives:** To explore the effect of age on the types of physical activity; To analyse the type of physical activity, frequency, intensity and duration that improved the blood-glucose levels and cardiovascular risk; To explore the greatest effect of physical activity on the different sub-groups of pre-diabetes; To assess the effects of ethnicity and physical activity; To identify what type of physical activity could be translated into primary care prevention programmes. **Methods:** A literature review was chosen for this research that enabled an in-depth search on the subject from a wide range of sources, and that reviewed studies nationally and internationally. The inclusion and exclusion criteria for the search was determined. Key words (PICO) were used and the databases that were searched were illustrated through a flow diagram. **Results:** Ten studies were identified and critiqued addressing the strengths and weaknesses and conclusions made. From the analysis of these studies three themes were identified. People with IGT showed a significant improvement in two-hour blood- glucose levels after physical activity. Cardiovascular benefits were significant when people increased their physical activity from the baseline. Cardiorespiratory fitness was significant in reducing fasting and two-hour glucose levels. **Summary:** Further research was suggested, in particular on the targeting of people with IGT. Features of an ideal randomised controlled trial were proposed based on the author's research and review of the literature. ■

P6

What are the factors associated with patient retention on the NHS Care Call Diabetes Prevention Programme (DPP) pilot in Salford?

Submitting author: ***Yoon Y****, University of Manchester, Manchester, UK*

Background: Type 2 diabetes mellitus (T2DM) is a growing health concern in the UK. In 2015, the NHS began to trial Diabetes Prevention Programmes (DPP), aimed at patients considered at risk of developing T2DM. The aim of this project was to investigate what factors, if any, were associated with patient retention on the Care Call DPP, a telephone-call service piloted in Salford. **Methods:** After data preparation, the dataset consisted of 329 patients. Statistical analysis was carried out to investigate whether age, gender, ethnicity, BMI, HbA_{1c} values and referral method were associated with patient retention on the programme. **Results:** A weak positive relationship was found between age and retention on the Care Call DPP (Rho=0.189 [95% confidence interval (CI), 0.083–0.291; P<0.01]). The median age of patients that completed the programme was 7 years greater than that of non-completers (95% CI, 2–9; P<0.01). No relationship was found between gender, ethnicity, BMI, HbA_{1c} values or referral method and patient retention. **Conclusion:** Further research is needed to explore why older patients are more likely to complete the Care Call DPP, in order to make changes to make the programme more inclusive. Future studies should use larger samples to obtain more reliable results on the relationship between ethnicity and referral method and patient retention. Long-term studies with control groups are needed to investigate the retention rate and effectiveness of the Care Call DPP at preventing T2DM compared to different service models. ■

P7

DPP-4 inhibitor dose selection in patients with type 2 diabetes mellitus and creatinine clearance >50 mL/min in UK general practice

Submitting author: ***Spanopoulos D****, Boehringer Ingelheim, Berkshire, UK*

Background: Previous studies have demonstrated that at least one third of type 2 diabetes mellitus (T2DM) patients with moderate renal impairment (creatinine clearance [CrCl] <50 mL/min) or worse initiating a DPP-4 inhibitor requiring a dose adjustment, were on a higher dose than the SPC recommendation. **Aims and objectives:** The aim of this study was to further examine DPP-4 inhibitor dose selection in patients whose renal function do not justify a dose adjustment, according to common renal thresholds specified in non-linagliptin DPP-4 inhibitor SPCs. **Methods:** This study adopted a cross-sectional design. Patients initiating on a DPP-4 inhibitor between April 2012 and June 2017 were identified in the Clinical Practice Research Datalink (CPRD). Counts and percentages were generated for patients who had a CrCl >50 mL/min and were initiated on a lower DPP-4 inhibitor dose. **Results:** Overall, excluding linagliptin-initiated patients as one dose is licensed regardless of renal function, 14% (2764/19 523) of DPP-4 initiated patients with CrCl >50 mL/min were on a lower than SPC specified DPP-4 inhibitor dose. Amongst sitagliptin, saxagliptin, alogliptin and vildagliptin-initiated patients, 14% (2061/14 779), 16% (488/3034), 12% (181/1565) and 22% (34/155) were initiated on a lower than the SPC-specified dose. **Conclusions:** This study provides further insights regarding DPP-4 inhibitor dose selection with respect to manufacturer specification in relation to renal function, demonstrating that approximately 1 in 7 non-linagliptin DPP-4 inhibitor-initiated patients whose renal function does not require a dose adjustment, were on a lower than the SPC-specified dose. ■

P8

Effects of once-weekly exenatide on clinical outcomes in the subgroup of patients with pre-existing cardiovascular disease: Insights from EXSCEL

Submitting author: ***Mentz RJ****, for the EXSCEL Study Group*

Methods: We evaluated outcomes by treatment group in the EXSCEL trial for the 10 782 participants (73% of the trial population) with known cardiovascular (CV) disease (i.e. history of major clinical manifestation of coronary artery disease, ischemic cerebrovascular disease or atherosclerotic peripheral arterial disease). Cox proportional hazards were used to compare the impact of once-weekly exenatide with placebo therapy on MACE, all-cause death, CV-related death, myocardial infarction, stroke, hospitalisation for acute coronary syndrome (hACS) and hospitalisation for heart failure. **Results:** Patients in the exenatide group demonstrated a 10% relative risk reduction for MACE (hazard ratio (HR), 0.90 [95% confidence interval, 0.816–0.999; nominal p-value, 0.047]). Each of the secondary endpoints favoured exenatide, compared with placebo, with the exception of hACS (HR, 1.03), but none met the nominal level of statistical significance (all nominal P>0.05). **Conclusion:** Exenatide once-weekly reduced the risk of MACE in a subgroup of patients with pre-existing CV disease in EXSCEL with no new or overall safety concerns. ■

P9

Treatment effects of once-weekly dulaglutide versus insulin glargine in patients with different baseline glycaemic patterns (based on high/low fasting or high/low postprandial glucose): A post-hoc analysis of the AWARD-2 clinical trial

Submitting author: ***Rao A****, Senior Scientific Editor, Bangalore, India*

Background: Insulin glargine (Glar) exerts its action by decreasing fasting plasma glucose (FPG), whereas dulaglutide (DU), a once-weekly GLP-1 RA, targets fasting and postprandial glucose (PPG). **Methods:** AWARD-2 *post-hoc* analysis assessed efficacy of DU vs Glar in type 2 diabetes patients with different glycaemic patterns at baseline determined by self-monitoring of blood glucose (fasting glucose [FG] vs PPG) using analysis of covariance. **Results:** Patients were categorized

into 4 groups based on combinations of low and high FG and PPG. Median baseline values of FG (151 mg/dL) and PPG (182 mg/dL) were used as threshold for low and high, respectively. DU showed statistically significant A1c reduction compared with Glar for all subgroups (low FG–low PPG: 0.6% (DU) and -0.2 (Glar), $P<0.01$; high FG–low PPG: –1.0% (DU) and –0.5% (Glar), $P<0.05$; high FG–high PPG: –1.4 (DU) and –0.9 (Glar), $P<0.01$], except for low FG/high PPG, where the numerical difference was in favour of DU (DU: –0.9%, Glar: –0.5%), but did not reach statistical significance. FPG change from baseline at week 52 was significant for all except DU in the low FG–low PPG subgroup. Change in PPG from baseline at week 52 was significant for all subgroups, except Glar in the low FG–low PPG subgroup. Total hypoglycaemia was numerically lower for DU vs Glar in all subgroups. **Conclusion:** DU showed efficacy on A1c reductions across different baseline glycaemic patterns vs Glar (with the exception of low FG–high PPG), indicating a clinical benefit of targeting both FG and PPG, irrespective of the baseline glycaemic phenotype. ■

P10

Nutritional food labelling awareness in the community

Submitting author: ***Duffy C****, Clinical Nurse Specialist, Ballina, Ireland*

Background and aim: Diet is a modifiable risk factor for cardiovascular disease (CVD). Food labels (FLs) can help consumers to make informed and healthy dietary choices. However, FLs can be complex and confusing. The aim of this survey was to explore the awareness, understanding and use of food labelling in the prevention of lifestyle-related disease in the community. **Methods:** This survey took place in the spring of 2017 in a general practice setting in the west of Ireland, having a mixed rural and urban population. A cross-sectional observational study design was used. A self-administered questionnaire was devised as a validated questionnaire was not sourced. **Results:** n=200 participants completed the survey. Mean age was 46±16 years. Females read FLs more frequently than males ($P<0.005$). 56% (n=110) believed FLs were very important. Over 40% of males rarely or never read FLs. Taking anti-hypertensive medication was not associated with increased frequency of reading FLs (P=0.865) or salt content (P=0.524). Only 56% (n=31) of participants who had a family member with diabetes read the sugar and salt content on FLs. Participants had difficulty analysing nutritional information and interpreting the traffic-light label. **Conclusion:** Like previous FL studies, participants had difficulty understanding and interpreting FLs. Most participants with CVD read about fat; however, only a third read about saturated fat, salt and fibre. Food labelling needs to be improved, especially for illiterate groups and people with colour and vision deficiency. The interpretation and appropriate use of FLs is poor, especially in males and people with recognised CVD risk factors. ■

P11

Accepting insulin treatment for reluctant people with type 2 diabetes mellitus. A global study to identify effective strategies (EMOTION): results from the UK cohort

Submitting author: ***Rao A****, Senior Scientific Editor, Bangalore, India*

Background: Many people with type 2 diabetes are reluctant to initiate basal insulin. Little research has been conducted on how this "psychological insulin resistance" (PIR) can be overcome. The global EMOTION study aimed to identify actions by healthcare providers (HCPs) that help patients accept and use insulin regularly. We conducted an online survey (including 38 items related to HCPs' actions) in seven countries. Here we present data from the UK population using descriptive statistics. **Methods:** Inclusion criteria: ≥21 years old, initiated basal insulin within the past 36 months, had type 2 diabetes ≥12 months before initiation, indicated being reluctant to begin insulin therapy when recommended, now currently using insulin. Patients were identified from patient panels or recruited from Diabetes.co.uk. **Results:** Participants from the UK (n=125 from 594 overall) had a mean age of 53.9 years, 40.0% were male. Most commonly reported actions that have "helped moderately/a lot to give insulin a try" were HCP "walked me through the process of exactly how to take insulin" (77.6%), "showed me an insulin pen" (73.6%), and "encouraged me to contact his/her clinic immediately if I run into any problems or have questions after starting insulin" (72.8%). The HCPs' action least likely reported as "helping moderately/a lot" was HCP "said he/she could not continue to treat me if I refused to start insulin" (11.2%). **Conclusion:** Demonstrating the actual insulin injection process and highlighting positive effects of insulin could contribute to overcoming PIR. Access to HCPs when needed most was valued by patients. ■

P12

Time-to-treatment intensification with GLP-1 receptor agonists for patients with type 2 diabetes (T2D) in the UK: Medical record review study

Submitting author: ***Rao A****, Senior Scientific Editor, Bangalore, India*

Background: The National Institute for Health and Care Excellence (NICE) guidelines recommend drug intensification in patients with HbA_{1c} levels ≤7.0% (53 mmol/mol). A recommended option is to add an injectable glucagon-like peptide-1 receptor agonist (GLP-1 RA) to their treatment regimen. **Methods:** Medical record review conducted in the UK involved patients ≥18 years of age, with T2D who newly initiated GLP-1 RA in the prior 6 months. Participating physicians were endocrinologists/diabetologists (specialists), general practitioners with special interest in diabetes (GPwSIs), and GPs with no special diabetes interest (GPs). This study examined time-to-treatment intensification with GLP-1 RA, and duration of poor glycaemic control (>7.0%) since most recently added oral regimen (oral±injectable). **Results:** 113 physicians (specialists, 38.9%; GPwSIs, 20.4%; GPs, 40.7%) contributed data for 1096 patients (specialists: 437 [39.9%]; GPwSIs: 216 [19.7%]; GPs: 443 [40.4%]). Most common treatment regimen prior to GLP-1 RA was oral (918 [83.8%]) followed by oral+injectable (145 [13.2%]). Median time from T2DM diagnosis and from most recently added oral diabetes regimen (oral±injectable) to GLP-1 RA initiation was 6 years and 3 years, respectively. Majority of patients on oral regimens had ≥1 uncontrolled HbA_{1c} prior to GLP-1 RA initiation (1047 [98.5%]). Median consecutive time patients on oral regimens were not under control, within 5 years prior to GLP-1 RA initiation was 13.5 months (specialists, 11.0; GPwSIs, 16.2; GPs, 17.0 months). **Conclusion:** Treatment intensification is often delayed despite consistently poor glycaemic control for more than 12 months. Findings highlight the importance of treatment intensification in reducing the risk of health complications. ■

P13

Reducing overtreatment amongst older people with type 2 diabetes at risk of severe hypoglycaemia

Submitting author: ***Hambling C****, West Norfolk CCG, Norfolk, UK*

Aim: To reduce intensive glycaemic management (HbA_{1c} <53 mmol/mol) in older people with type 2 diabetes at risk of severe hypoglycaemia. **Method:** Quality improvement (QI) programme of glycaemic attainment in people with type 2 diabetes, age ≥70 years, prescribed sulfonylurea (SU) or insulin therapies, registered with 16 practices. Data were extracted for 12-month periods prior to baseline (May 2015) and 12 months after QI implementation (September 2016). **Criteria and standards:** In older people: **1**. with (a) chronic kidney disease (CKD; eGFR ≤59 mL/min/1.73m^2) or (b) dementia, treatment to HbA_{1c} <53 mmol/mol should be avoided (90%); **2**. glibenclamide should not be prescribed (100%). The QI initiative included feedback, education and algorithms guiding glycaemic goals and de-intensification of SU and insulin therapies. **Results (complete cases):** Baseline: 1379/3862 (35.7%) people with type 2 diabetes, median age 78 years, were prescribed SU or insulin therapies. Median HbA_{1c} was 58 mmol/mol

(interquartile range [IQR], 51–68 mmol/mol). Of 611 (47%) people with CKD and 52 (4.1%) with dementia, 425 (69.6%) and 33 (63.5%), respectively, had HbA_{1c} >53 mmol/mol; 5 were prescribed glibenclamide. Following QI implementation, fewer people were prescribed SU and/or insulins (1380/4160 [33.2%]; *P*=0.017); median HbA_{1c} was significantly higher, 62 mmol/mol (IQR 54–72 mmol/mol; *P*<0.001). Fewer in this cohort had CKD or dementia. Of 573 (44.5%) with CKD and 40 (3.2%) with dementia, 444 (77.4%) and 28 (70%), respectively, had HbA_{1c} >53 mmol/mol. None was prescribed glibenclamide. **Conclusion:** The proportion of older people with type 2 diabetes and CKD or dementia prescribed SU and/or insulin therapies was significantly reduced, with fewer intensively managed following the QI initiative, with no reported harm. ■

P14

Semaglutide treatment and renal function in the SUSTAIN 6 trial

Submitting author: ***Bellary S****, University Hospitals Birmingham NHS Foundation Trust and Aston University, Birmingham, UK*

Background: Semaglutide is a new glucagon-like peptide-1 (GLP-1) receptor agonist for the once-weekly treatment of type 2 diabetes (T2D). SUSTAIN 6 was a cardiovascular outcomes trial that randomised 3297 patients with T2D to once-weekly semaglutide (0.5 mg or 1.0 mg) or placebo, both plus standard care, for 104 weeks. **Aims:** This post-hoc analysis assessed the effect of semaglutide on renal function by baseline estimated glomerular filtration rate (eGFR) in SUSTAIN 6. **Methods:** Changes in renal function, urine albumin-to-creatinine ratio (UACR) and acute renal adverse events (AEs) were assessed, categorised by baseline eGFR (mL/min/1.73 m^2: normal [≥90], mild [<90], moderate [<60] and severe impairment [<30]). **Results:** Overall, mean eGFR decreased from baseline to week 104 across all treatment groups and subgroups, with the largest decreases in patients with normal renal function (–9.6, –7.4, –8.6, –6.5 mL/min/1.73m^2 for semaglutide 0.5 mg, placebo 0.5 mg, semaglutide 1.0 mg and placebo 1.0 mg, respectively) or mild renal impairment (–4.8, –4.2, –3.2, –5.6), compared with moderate (–2.1, –4.8, –2.4, –4.2) and severe impairment (–4.1, –1.8, –0.5, –2.6). UACR decreased with increasing renal impairment for semaglutide 1.0 mg, but not other treatment groups. AE rates related to acute renal failure were generally higher with increasing baseline renal impairment. New or worsening nephropathy rate was lower with both doses of semaglutide versus placebo (4.4 vs 6.6% for the 0.5 mg doses, and 2.8 vs 5.5% for the 1.0 mg doses). **Conclusions:** No renal-related safety issues were observed with semaglutide regardless of baseline renal function in SUSTAIN 6. ■

P15

Improving treatment targets: implementation of the diabetes treatment and care transformation fund at CCG level

Submitting author: ***Askey A****, St John's Medical Centre, Walsall, UK*

Aims: Walsall CCG was successful in obtaining diabetes transformation funds to improve the percentage of people with diabetes reaching three treatment targets, with the aim to improve by at least 1.5% in the first year. **Methods:** All practice teams, to include GP, practice nurse and practice manager, were invited to workshops where the scheme was presented with examples of quality improvement methodology. Practice teams were given time to consider their own data from the National Diabetes Audit and plan together how best to use their resources to increase the percentage of people with diabetes reaching treatment targets. PRIMIS data was extracted monthly and presented back to participating practices. **Results:** In the first year of the initiative there was an increase of 1019 additional patients reaching three treatment targets, an increase of just over 4% from 37.7% to 41.9% (using PRIMIS data, which has a different denominator from the National Diabetes Audit). Twenty-five practices managed to increase by more than 5%. Ten practices achieved an increase of more than 40 patients reaching treatment targets, with the greatest increase being 17.8% (from 32% to 49.8%). **Conclusion:** The implementation of this transformation-funded improvement initiative was successful in Walsall CCG, where further improvements are expected in the second year of this funding. Regular data analysis supported the scheme. Practice teams benefitted from having time to plan their work with clinicians and managers looking at their individual practice data together. ■

P16

Improving the diabetes care of individuals with severe mental illness

Submitting author: ***Sud D****, Leicestershire Partnership NHS Trust, Leicester, UK*

Background: People with severe mental illness (SMI; e.g. schizophrenia) die early from physical health disease, mainly, cardiovascular disease (CVD). They have increased risk factors for CVD, including diabetes, smoking, obesity and mental health medication. Despite frequent contact with health services, they are less likely to be screened or to receive interventions for cardiometabolic risk or metabolic syndrome. National data show only around 24% those with SMI receive the necessary screening. Clinical guidelines have been in existence for decades, yet disparity still exists resulting in a 15–20-year shortened life-expectancy. **Aim:** Improve both the rate of screening and the implementation of related interventions for cardiometabolic risk and metabolic syndrome amongst those with SMI within community mental health. **Objectives:** Set up a pharmacist-led service which would encompass a centralised electronic database for recording of screening and related interventions. This service should: **1**) coordinate the comprehensive collection of relevant health data from all sources (primary and secondary care records, healthcare professionals and laboratory service); **2**) prompt, coordinate and follow-up screening and appropriate clinical interventions where they had not already been completed, including sending blood forms to appropriate staff to give to patients and signposting for smoking cessation. **Methods:** Bespoke database and dedicated staff employed – senior pharmacist, pharmacy technicians and administrative. **Results:** Baseline data: 24% of individuals received relevant screening. During 2015/16, 95% received screening and related clinical interventions, and during 2016/17 it was 97%. **Conclusions:** A dedicated pharmacist-led service can produce significant improvements in both screening and related clinical interventions for both the treatment and prevention of diabetes for individuals with SMI. ■

P17

Effect of moderate exercise on incretin hormone level in type 2 diabetes

Submitting author: ***Alsubaie N****, Clinical Pharmacist, Leicester, UK*

Aim: The aim of this study was to prove that combination exercise is important. It compared people with type 2 diabetes (T2D) and non-diabetes (ND), who are doing combination exercise. This study focused on the changes in incretin level in the T2D group to see if exercise had any effect on the secretion of this hormone and, additionally, to compare it within T2D for those who are using different medication for diabetes. **Method:** There were 17 T2D and 8 ND participants. The mean ages were 48.6±2.6 years in the T2D group and 31.6±4 years in the TD group. The two groups performed 6 weeks of moderate exercise. **Results:** All the anthropometric variables changed in both groups and that was significant. In T2D, there was a significant reduction in the HbA_{1c} level from 55.7± 2.7 mmol/mol to 48.9±2.1 mmol/mol (P<0.00). In T2D, the GLP-1 was 9.7±2.1 and then decreased to 7.0±1.0 (*P*=0.333) in all T2D, which shows no significant effect of exercise on GLP-1. However, this effect shows the highest improvement in the T2D group who are using metformin and SGLT2 inhibitors where GLP-1 was 3.9±1.5 and increased to 11.0±0.8 (*P*=0.196). **Conclusion:** In T2D and ND, combination exercise has a significant effect on HbA_{1c}. The improvement was higher in the T2D group. Generally, this study found that 6 weeks of moderate combined exercise has no effect on the GLP-1 level in T2D participants. However, the metformin and SGLT2-inhibitor group showed improvement in GLP-1 after S12.

P18

Semaglutide reduces body weight versus dulaglutide across baseline BMI subgroups in SUSTAIN 7

Submitting author: ***Viljoen A****, East and North Hertfordshire NHS Trust, UK*

Background: Semaglutide, a new glucagon-like peptide-1 analogue for type 2 diabetes (T2D) treatment, showed significant reductions in HbA_{1c} and body weight (BW) across the SUSTAIN clinical trial programme. SUSTAIN 7 compared the efficacy and safety of semaglutide versus dulaglutide in patients with T2D inadequately controlled with metformin monotherapy. **Aims:** This *post-hoc* analysis assessed the weight-loss (WL) effects of semaglutide versus dulaglutide by baseline body mass index (BMI) subgroups in SUSTAIN 7. **Methods:** Patients were grouped by baseline BMI (<25, 25–<30, 30–<35, ≥35 kg/m^2). Post-baseline data were analysed using mixed model for repeated measurements with treatment, baseline BMI subgroup and treatment by subgroup interaction as fixed factors and baseline BW as covariate. **Results:** At week 40, mean BW (baseline=95.2 kg) was reduced across BMI subgroups: 3.6–5.5 kg versus 0.9–3.4 kg with semaglutide 0.5 mg versus dulaglutide 0.75 mg, and 5.2–7.6 kg versus 2.0–3.8 kg with semaglutide 1.0 mg versus dulaglutide 1.5 mg. Higher baseline BMI generally led to greater treatment-induced absolute WL from baseline. More patients achieved ≥5% and ≥10% WL with semaglutide versus dulaglutide in all subgroups. In the ≥35 kg/m^2 subgroup, ≥10% WL was achieved by 14% of patients with semaglutide 0.5 mg versus 4% with dulaglutide 0.75 mg, and 25% with semaglutide 1.0 mg versus 6% with dulaglutide 1.5 mg; 39% versus 27% and 58% versus 32% of patients achieved ≥5% WL, respectively. Adverse events occurred at similar rates across BMI subgroups in all treatment arms. **Conclusions:** BW reductions were greater with semaglutide versus dulaglutide regardless of baseline BMI, consistent with SUSTAIN 1–5 findings assessing semaglutide versus comparators. ■

P19

Predicting type 2 diabetes development among patients in general practice – a prospective analysis comparing HbA_{1c} with fasting plasma glucose

Submitting author: ***Millar S****, University College Cork, Cork, Ireland*

Background and objectives: Evidence suggests discordance between glycated haemoglobin A1c (HbA_{1c}) and fasting plasma glucose (FPG) for the diagnosis of pre-diabetes. In this study, we compared the ability of HbA_{1c} and FPG to discriminate incident diabetes cases in order to determine which marker more accurately predicts type 2 diabetes development among patients in general practice. **Materials and methods:** This was a prospective study involving a random sample of 1754 men and women aged 46–73 years. Receiver operating characteristic curve, integrated discrimination improvement and net reclassification improvement (NRI) analyses were used to evaluate the ability of HbA_{1c} and FPG to accurately classify high-risk subjects. **Results:** During the 6-year study period, there were 65 incident type 2 diabetes cases. Joint measurement, using both HbA_{1c} and FPG together, displayed the highest area under the curve (AUC) to discriminate incident diabetes (AUC, 0.91 [95% CI, 0.87–0.94]) followed by FPG alone (AUC, 0.88 [95% CI, 0.83–0.92]) and HbA_{1c} alone (AUC, 0.80 [95% CI, 0.73–0.86]). When using both markers together, an optimal cut-off had a sensitivity of 0.85, a specificity of 0.83 and demonstrated significant overall NRI when compared to optimal HbA_{1c} and FPG thresholds and currently recommended HbA_{1c} and FPG pre-diabetes cut-offs. **Conclusion:** FPG is superior to HbA_{1c} as an indicator of diabetes risk. Using HbA_{1c} and FPG together may improve accuracy for detecting high-risk patients. As diagnostic performance can vary, external validation in the population to be tested should be undertaken to evaluate each marker's performance and determine optimal pre-diabetes threshold values. ■

P20

Inclusion criteria in SGLT2 inhibitor cardiovascular outcome trials (CVOTs): comparing "apples and oranges" in a national diabetes cohort

Submitting author: ***Hinton W****, University of Surrey, Guildford, UK*

Background: Cardiovascular outcome trials (CVOTs) are mandated in several classes of drugs. The inclusion/baseline characteristics differ in age, diabetes duration, BMI, HbA_{1c}, prior cardiovascular disease, hypertension and insulin use. The number of patients deemed suitable for treatment with an SGLT2 inhibitor according to the individual inclusion criteria of CVOT for each drug has not previously been reported in a large English general practice-based diabetes population. **Aims and objectives:** To determine the proportion of patients that met inclusion criteria for each SGLT2 inhibitor CVOT in a real-world primary care population. **Methods:** In a cross-sectional study, we explored the generalisability of published inclusion criteria of four SGLT2 inhibitor CVOTs: canagliflozin (CANVAS), dapagliflozin (DECLARE), empagliflozin (EMPA-REG) and ertugliflozin (VERTIS) using the Royal College of General Practitioners' Research and Surveillance Centre database (n=1 595 445). Adults with type 2 diabetes (T2DM) were identified and prevalence of each trial inclusion criteria was determined. **Results:** From a total (n=84,394) T2DM cohort, the proportion meeting the inclusion criteria for each CVOT were: CANVAS 16.9% (95% CI, 16.61–17.11), DECLARE 36.1% (95% CI, 35.81–36.46), EMPA-REG 6.7% (95% CI, 6.50–6.84) and for VERTIS 7.3% (95% CI, 7.08–7.43). **Conclusions:** Inclusion criteria play a key role in determining the generalisability of studies in real-world practice. Only a small proportion of the general practice T2DM population have SGLT2 inhibitor indications according to the inclusion criteria of the major CVOTs. Increase in prevalence is usually associated with the addition of individual cardiovascular risk factors as well the presence of previous vascular disease. ■

P21

A digital education and behaviour change coaching delivers positive lifestyle changes among individuals with risk factors for type 2 diabetes: Changing Health

Submitting author: ***Grumitt J****, Changing Health, Newcastle-upon-Tyne, UK*

Aim: This evaluation examined the impact of evidence-based digital diabetes education and behaviour-change coaching on diet, activity and weight of overweight participants. **Methods:** 400 people were screened, with 150 fulfilling the inclusion criteria of a BMI >30 and no contraindications to weight loss of physical activity. Participants were given access to a web/mobile evidence-based digital structured education programme targeting weight loss and physical activity over a 8–12-week period. Digital education and tracking was accompanied by up to 10 brief (<10 min) phone coaching sessions. Weight and physical activity were recorded on the digital platform and participants completed online surveys at baseline and months 1, 2, 3 and 6 to report their current weight and changes in diet and physical activity. **Results:** Of the 150 eligible participants, 87% were female, average age was 60 years, 27% were overweight and 57% were obese. 74% reported an improvement in diet at 1 month, increasing to 90% at 6 months. 63% reported increased physical activity at 1 month, increasing to 83% at 6 months. After the 8-week intervention period average, weight loss was 3.3 kg, with 36% achieving a clinically significant reduction of 6% of body weight. Among those who reported data at 6 months, 94% went from overweight to normal BMI, and 63% went from obese to either the overweight or normal BMI. **Conclusion:** A scalable digital structured education and behaviour-change tools accompanied by one-to-one coaching can deliver clinically meaningful changes in weight loss through diet and physical activity remotely. ■

P22

Digital education and behaviour change programme helps patients in Waltham Forest, London, achieve weight loss and HbA_{1c} reduction

Submitting author: ***Grumitt J****, Changing Health, Newcastle-upon-Tyne, UK*

Aim: To establish whether evidence-based digital diabetes education and personalised lifestyle coaching can empower people with type 2 diabetes in Waltham Forest to lose weight and improve glycaemic control. **Methods:** Patients with type 2 diabetes were referred to Changing Health's diabetes management programme by their GPs in Waltham Forest CCG between October 2017 and August 2018 (n=17). Service users were supported by a structured education programme targeting diet and physical activity over a 6-month period. Digital education and behavioural tools were supported by up to ten brief coaching telephone coaching sessions (<10 min). Patient-reported outcome measures (PROMs) of glycaemic control (HbA1c) and weight were evaluated in September 2018. **Results:** The average self-reported weight reduction from baseline was 5.7 kg, while the average self-reported reduction in HbA_{1c} from baseline was 22.3 mmol/mol. In some cases, this resulted in diabetes remission. For example, Janice, who began the programme with baseline HbA_{1c} and weight of 89 mmol/mol and 107 kg respectively, reduced her HbA_{1c} to 42 mmol/mol at 6 months, below the threshold for type 2 diabetes, with weight loss of 18 kg. **Conclusion:** This case study illustrates that digital diabetes education and personalised lifestyle coaching can achieve substantial weight loss and improved glycaemic control for patients with type 2 diabetes in Waltham Forest, and can lead to remission. The data suggest that, delivered at scale, this solution could significantly improve diabetes clinical outcomes across the UK, mitigating the growing burden of unhealthy lifestyle choices on health economies. ■

P23

A project into implementing dedicated diabetes clinics in general practice and introducing individualised patient care plans

Submitting author: ***Grimstone A****, The Belgravia Surgery, London, UK*

Background and aims: An individual care plan for all adults with type 2 diabetes is recommended by the NICE guidance. Screening for complications of diabetes is the basis of the nine key care processes for diabetes (BMI, smoking, HbA_{1c}, cholesterol, BP, eGFR, urine ACR, retinal screening and foot check). Impetus for the project was an audit conducted into retinal screening. Specifically, if our patients were having their retina screened according to local dashboard targets (within 15 months) and NICE guidance (with 12 months). **Methods:** On practice computerised searches, 58% of patients were recorded to have had retinal screening within 15 months; this figure was less (36%) when the dashboard figures were viewed. Closer analysis revealed over 80% of patients had attended for retinal screening, but this was not recorded. This audit led to a wider project into reviewing our performance and coding (reporting) of all nine key care processes and care planning. The project aimed to introduce individualised patient care plans, improve performance in nine key care processes and to implement change through setting up new diabetes nurse and GP led clinics. **Results:** The percentage of patients achieving all nine processes rose from 16.2% to 44.8% in the 3 months the clinics were running. Currently it is 48.6%. Specifically, retinal screening is currently at 83.5%. Objectives in care planning were successfully implemented, improving from 2.4% patient care plans held to 24.2% over the project's 3 months, and currently it is 51.8%. Conclusions: We still have considerable scope to improve our standards with CCG targets of 65–70% of patients to have a patient-held care plan and 55–60% to have all nine key care processes screened within 15 months. ■

P24

How to improve the understanding of carbohydrates in Black Asian and minority ethnic (BAME) communities with type 2 diabetes in a UK Clinic

Submitting author: ***St John J****, London North West Healthcare NHS Trust, and London Metropolitan University, London, UK*

Aims: This pilot study aimed to demonstrate that using a picture-based, culturally relevant, dietary booklet to provide dietary advice for newly diagnosed BAME people with type 2 diabetes, could enable healthcare professionals to improve the knowledge and understanding of carbohydrates in BAME communities with type 2 diabetes. **Method:** BAME adults with type 2 diabetes attending an intermediary diabetes clinic in north-west London between February and March 2017 were invited to participate in the pilot study. A questionnaire was administered by researchers before and after the participant's appointment with a dietitian. The dietitian used a picture-based, culturally relevant, newly designed booklet depicting foods commonly eaten by Black, Asian and Ethnic minority communities. The carbohydrate content of the foods in the booklet was represented as sugar spoon equivalents, to enable the participants to: Have a visual representation of the carbohydrate content of commonly eaten foods to enable a better understanding of the carbohydrate content; Facilitate improved self-management of their type 2 diabetes; Three culturally specific dietary booklets designed and based on Gujarati, Caribbean and Pakistani foods formed the basis of the dietary instruction and intervention. Separate investigators were used to provide the intervention or to administer the questionnaires. **Results:** The participants' ability to estimate the carbohydrate content of foods, snacks and drinks pre and post the intervention showed consistently significant improvement. **Conclusions:** This pilot study demonstrates that if healthcare professionals use a culturally relevant, pictorial booklet to provide dietary information for Black, Asian and minority ethnic communities, they can assist people recently diagnosed with type 2 diabetes within BAME communities to improve their understanding of carbohydrates and the impact of carbohydrates in the food they commonly eat on their blood glucose control. ■

P25

The expanding role of the diabetes facilitator

Submitting author: ***Lartey A****, Norfolk & Norwich University Foundation Trust, UK*

Aims: The diabetes facilitator team (DFACs) is an expanding and developing team within Norfolk & Norwich, providing support to GP practices to promote an integrated approach to the management of diabetes in primary and secondary care. The role of the diabetes facilitator is often misunderstood; it is often viewed as a training and educator role. Whilst we do offer training and education sessions for patients and staff, the team of community diabetes specialists run and manage nurse-led clinics for complex patients, including insulin and GLP-1 initiation. We provide telephone advice and home visits, and support care homes with their patients. **Objectives:** Diabetes prevalence modelling for NHS Norfolk in 2012 suggested that by 2030 there would be at least 75 709 people with diagnosed or undiagnosed diabetes in NHS Norfolk at a prevalence of 9.7%. This is a massive clinical, personal and public health challenge. Most of this increase will be in the type 2 diabetes population managed in general practice. Due to these increasing demands, the diabetes facilitator team was set up in 2002 to provide specialist nursing care and support to GPs and practice nurses within the primary care setting, and to reduce the variation in the quality of care. **Results:** The diabetes facilitator team has continued to grow, with over 7 WTE nurses now in post, providing support to over 46 GP practices. On average the team conduct 450 follow ups and see up to 90 new patients a month. Education is a major part of the DFACS role, with the team running type 2 education sessions, as well as update sessions for GPs

and practice nurses. The team is now also actively involved in research, audit and pathway writing. We are looking to expand our role, with the DFAC team becoming nurse-led prescribers. **Summary:** As the number of people with diabetes continues to grow in Norfolk, so does the DFAC role. ■

P26

WISDOM: West Hants Improving Shared Diabetes Outcome Measures

Submitting author: ***Donoghue V****, West Hampshire Community Diabetes Service, Lyndhurst, UK*

Background: West Hampshire Community Diabetes Service delivers clinical care and education to type 1 and type 2 diabetes patients (total >24 000 patients). Annual consultant outreach visits to surgeries identified significant variation in clinical outcomes matched by variation in clinical processes rather than knowledge alone. Whilst type 1 outcomes are above average, type 2 outcomes (particularly blood pressure [BP]) lag behind, leading to a CCG Improvement and Assessment Framework (CCG IAF) rating of inadequate. **Aims:** WISDOM was awarded funding through the transformation fund in Autumn 2017, in order to reduce variation and improve outcomes. A collaborative relationship enabled the team to rapidly develop a peer-to-peer model which would create a safe environment to share learning. Specialist oversight extended to clinical governance rather than delivery, which was led by GPSIs and Diabetes Nurses. **Methods:** A multidisciplinary team (MDT) coordinator identified clusters of three surgeries. Surgeries are rewarded for identifying patients who are not to target (BP, cholesterol and HbA_{1c}) using the PRIMIS Audit tool and discussing a percentage of these at a regular surgery MDT with GP and Practice Nurse. These clinical leads then attend a quarterly cluster meeting. We reviewed feedback from these cluster meetings. **Results:** Our quantitative analysis revealed themes around three areas: **1**. Process: "Every blood test counts", new registrations, BP monitors in reception; **2**. Culture: Re-allocating roles and skill mix; **3**. Learning and knowledge: Sharing template letters (statins and metformin) and understanding Q risk. **Conclusion:** This appreciative enquiry approach has given practices time to reflect and broadened their minds/scope of practice to look beyond HbA_{1c} alone. ■

Notes