Irish Endocrine Society 45th Annual Meeting
19th-20th November 2021

Local Organizer: Professor Siobhán McQuaid
Dept. of Endocrinology Mater Misericordiae University Hospital Dublin 7
Disclosure Statement

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| Year | Novo Lecture (named in 2016 as the Hadden lecture) | Nordisk Lecture (named in 2016 as the McKenna Lecture) |
|------|--------------------------------------------------|-----------------------------------------------------|
| 1976 | DK O’Donovan                                    |                                                     |
| 1977 | S Bloom                                         |                                                     |
| 1978 | J.H.S. Robertson                                |                                                     |
| 1979 | A.G. Cudworth                                   |                                                     |
| 1980 | D.A.D. Montgomery                               |                                                     |
| 1981 | Peter Watkins                                   |                                                     |
| 1982 | G. Joplin                                       |                                                     |
| 1983 | D.R. London                                     |                                                     |
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| 1992 | R.V. Ragontte                                   | DH Hadden                                           |
| 1993 | Bruce Weintraub                                | David Powell                                        |
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| 1995 | Robert Lindsay                                  | Brian Sheridan                                       |
| 1996 | C.R.W. Edwards                                  | Rosemary Freaney                                     |
| 1997 | Stephanie Amiel                                 | David McCance                                       |
| 1998 | Robert Turner                                   | Randle Hayes                                        |
| 1999 | Ian Hay                                         | K Cunningham                                        |
| 2000 | Stephen O’Rahilly                               | Michael Cullen                                      |
| 2001 | Andre Lacroix                                   | Daphne Owens                                        |
| 2002 | J. Tuomilehto                                  | CJ Thompson                                         |
| 2003 | Tony Weetman                                    | John O’Brien                                        |
| 2004 | R.V. Thakker                                    | RGR Firth                                           |
| 2005 | P.M. Stewart                                    | FPM O’Harte                                         |
| 2006 | Kevin Docherty                                  | CH Walsh                                            |
| 2007 | Lynnette Nieman                                 | Timothy O’Brien                                     |
| 2008 | Ken Ho                                          | Donal O’Shea                                        |
| 2009 | Daniel J. Drucker                               | Steven Hunter                                       |
| 2010 | Joseph G. Verbalis                              | James Gibney                                        |
| 2011 | Thomas A. Buchanan                              | Maria Byrne                                         |
| 2012 | Beverly M.K. Biller                             | Fidelma Dunne                                       |
| 2013 | Mark McCarthy                                   | Diarmuid Smith                                      |
| 2014 | Karel Pacak                                     | Sean F Dinneen                                      |
| 2015 | European Society of Endocrinology meeting, Dublin |                                                    |
| 2016 | David M. Nathan                                 | Amar Agha                                           |
| 2017 | Marta Korbonits                                 | Aine McKilllop                                      |
| 2018 | Bernard Zinman                                  | Paula O’Shea                                        |
| 2019 | William B Drake                                 | Mark Sherlock                                        |
| 2020 | Helen Murphy                                    | Donal O’Gorman                                      |
PRESIDENTS OF THE IRISH ENDOCRINE SOCIETY

| YEAR | PRESIDENT          |
|------|--------------------|
| 1976 | DAD Montgomery     |
| 1978 | DK O’Donovan       |
| 1980 | MI Drury           |
| 1982 | DJ O’Sullivan      |
| 1984 | J Weaver           |
| 1986 | J Devlin           |
| 1988 | DR Hadden          |
| 1990 | GM Tomkin          |
| 1992 | AB Atkinson        |
| 1994 | TJ Mc Kenna        |
| 1996 | JB Ferriss         |
| 1998 | JR Hayes           |
| 2000 | J O’Donnell        |
| 2002 | PPA Smyth          |
| 2004 | B Sheridan         |
| 2006 | PM Bell            |
| 2008 | RGR Firth          |
| 2010 | DJ O’Halloran      |
| 2012 | T O’Brien          |
| 2015 | F O’Harte          |
| 2018 | BT Kinsley         |

Programme Irish Endocrine Society Annual Meeting 19/20th November 2021

Friday 19th November 2021

9.25  Introduction: Professor J Gibney

9.30 – 11.00  MEET THE PROFESSOR; Professor E Nieschlag, University of Münster. Testosterone substitution: for whom, when and how?

11.00 – 11.30  BREAK/PHARMA INDUSTRY PRESENTATIONS

11.30 – 12.50  POSTER VIEWING (VIRTUAL)

12.55  WELCOME AND INTRODUCTION Professor B Kinsley

13.00 – 13.30  INVITED POSTER PRESENTATIONS

13.00 – 13.05  P1. Impact of IGF-1 and GH assay type on the interpretation of growth hormone day curve results in the assessment of acromegalic disease activity
T McDonnell1,2, E Brown1, M Javadpour3, D O’Brien3, MW O’Reilly1,2, WP Tormey4, CJ Thompson1,2, M Sherlock1,2
1Academic Department of Endocrinology, Beaumont Hospital, Dublin Ireland
2Department of Endocrinology, Royal College of Surgeons in Ireland
3Department of Neurosurgery, Beaumont Hospital, Dublin Ireland
4Department of Chemical Pathology, Beaumont Hospital, Dublin, Ireland.

13.10 – 13.15  P2. HbA1c testing following transition of people with uncomplicated type 2 diabetes from outpatient diabetes clinics to general practice
M O’Donnell1, J Brazil2, D Griffin3, L Hurley4, S Dinneen1,2, S Kelly5, T Griffin2
1School of Medicine, NUI, Galway
2Centre for Diabetes, Endocrinology and Metabolism, Galway University Hospitals
3Dept of Biochemistry, Galway University Hospitals
4Galway Primary Care, Community Healthcare West
5Irish College of General Practitioners.

13.15 – 13.30  P3. Hypoglycaemia in a Metastatic Gastrin secreting Pancreatic NET on Insulin Pump Therapy
C Miller, M Crowley, ML Healy, N Phelan, A Pazderska
Department of Endocrinology, St James’s Hospital, Dublin.
13.15 – 13.20  P4. Case Report: Transient Postpartum Hypopituitarism
A Neely1, E McKenna2, J Addley3, C M McHenry1, J Maxwell1
Departments of 1Endocrinology, 2Radiology, 3Gastroenterology, Ulster Hospital, Belfast BT16 1RH

13.20 – 13.25  P5. Case Report: Subacute thyroiditis post viral vector vaccine for Covid-19
C Casey, T Higgins
University Hospital Kerry, Tralee, Co. Kerry.

13.25 – 13.30  P6. U500 insulin in the management of severe insulin resistance in pregnancy.
L Ryan1, Y Moloney2, J Slavin2, A Melvin1,2, E Noctor1,2,3
1University Hospital Limerick
2University Maternity Hospital Limerick
3University of Limerick Graduate Entry Medical School, Limerick, Ireland

13.30 – 13.45  OC1 Liquid-chromatography-tandem-mass-spectrometry (LC–MS/MS) demonstrates greater aldosterone/renin ratio in unselected African-origin compared to matched European-origin participants but a similar proportion of abnormal results
KS Ahmed1, E Ali1, M Mustafa1, J Okiro1, I Frizelle1, R Dineen1, A Rakovac2, M Sherlock1, A McGowan1, LA Behan1, G Boran2, Gibney J1
1Robert Graves Institute
2Department of Chemical Pathology, Tallaght University Hospital, Dublin 24

13.45 – 14.00  OC2 Changes in vitamin D concentration and deficiency in the West of Ireland during the Covid-19 lockdown
C Moran1, M O’Sullivan1, T Griffin2,3, H Doheny4, D McCartney1, PM O’Shea3,4
1School of Biological and Health Sciences, Technological University Dublin—City Campus, Central Quad, Grangegorman, Dublin 7, D07 XT95, Ireland
2Centre for Endocrinology, Diabetes Mellitus and Metabolism, Saolta University Health Care Group (SUHCG), Galway University Hospital Galway, Galway, Ireland
3School of Medicine, National University of Ireland Galway (NUIG), Galway, Ireland
4Department of Clinical Biochemistry, Saolta University Health Care Group (SUHCG)

14.00 – 14.15  OC3 Transcutaneous electrical neurostimulation of dermatome T6 lowers glucose and blood pressure: a randomised controlled study.
J Ioana1,2,3, K Hutchinson4, B de Aguilar4, J Faul2, S Sreenan1
Departments of 1Diabetes and Endocrinology, 2Respiratory Medicine Connolly Hospital, Blanchardstown, Dublin 15
3Hermitage Medical Clinic, Lucan, Dublin 20
4Eurofins, Biomnis, Dublin 18

14.15 – 14.30  OC4 Pre-frailty in working middle-aged and older adults with and without diabetes and its association with fear of health limiting their ability to work and early retirement plans: A European overview
D Segin1, M O’Donovan2, R O’Caioimh2,3, A Liew4,5
1School of Nursing and Midwifery, National University of Ireland, Galway, Galway City, 26 Upper Newcastle, Galway, H91 E3YV Ireland
2University College Cork, Cork City, Ireland
3Mercy University Hospital, Grenville Place, Cork City, Ireland
4School of Medicine, National University of Ireland Galway, Galway City, Ireland
5Portiuncula University Hospital, Galway, Ireland

14.30 – 14.45  OC5 Metabolic Effects 15 years after Haematopoietic Stem Cell Transplant
C Mangan, D Moloney, N Phelan, M Healy
St. James Hospital James St, Dublin 8, D08 NHY1, Ireland

14.45 – 15.00  OC6 Mucosal Associated Invariant T cells are associated with insulin resistance in childhood obesity and can disrupt insulin signalling via interleukin-17
R Bergin1, D Kinlen2, NK-Mehta1, D Cody, A E. Hogan1,2,3, D O’Shea3
1Lonsdale Human Health Institute, Maynooth University, Co. Kildare
2St Vincent’s University Hospital, Dublin 4
3National Children’s Research Centre, Children’s Health Ireland Crumlin, Dublin 12
15.00 – 15.15 OC7 Relative Contribution of Oral and Inhaled Glucocorticoid Exposure to Risk of Adrenal insufficiency in Asthma Treated with Fluticasone Propionate
J Martin-Grace1, V Brennan2, C Mulvey2, G Greene3, G Collier1, T McCartan2, L Lombard2, J Walsh2, S Plunkett2, E MacHale1, RW. Costello1, M Sherlock1
1Departments of Endocrinology
2Departments of Respiratory Medicine
3Departments of Clinical Biochemistry, Beaumont Hospital/ Royal College of Surgeons in Ireland, Dublin 9, Ireland
*J Martin-Grace and V Brennan are joint first authors

15.15 – 15.30 OC8 Outcomes of a National cohort of 1000 pregnancies in women with pre-gestational diabetes Type 1 and Type 2: 2015–2020
C Newman, AM Egan, L Carmody, B Kirwan, F Dunne on behalf of the National Diabetes in Pregnancy Audit Working Group
National University of Ireland, Galway, Republic of Ireland.

15.30 – 16.25 BREAK/PHARMA INDUSTRY PRESENTATIONS

16.25 – 16.55 ORAL COMMUNICATIONS

16.25 – 16.40 OC9 In Type 1 diabetes, lipidomic profiling demonstrates differing phosphatidylcholine concentrations in participants with increased carotid intima media thickness (CIMT).
I Frizelle1, M Ahmed1, R Byrne2, A Gunness1, A McGowan1, K Moore1, G Boran2, FC McGillicuddy3, J Gibney1
1Robert Graves Institute
2Dept of Chemical Pathology, Tallaght University Hospital, Dublin 24
3Diabetes Complications Research Centre, School of Medicine, University College Dublin, Belfield, Dublin 4

16.40 – 16.55 OC10 Diabetic model development and investigation of the therapeutic effect of MSC-scaffold bio-complex
S Du1,2, M Creane1, C SanzNogués1,2, X Chen1, S Hynes2, D Catergiu3, A Stanley4, D Dockery1, S Elliman3, D Zeugolis5,6, T O’Brien1,2
1Regenerative Medicine Institute (REMEDE), National University of Ireland Galway, Galway, Ireland
2Science Foundation Ireland (SFI) Centre for Research in Medical Devices (CÚRAM), National University of Ireland Galway, Galway, Ireland
3Division of Anatomic Pathology, Galway University Hospitals, Galway, Ireland
4Discipline of Anatomy, National University of Ireland Galway, Galway, Ireland
5Orbsen Therapeutics Ltd, IDA Business Park, Dangan, Galway, Ireland
6Regenerative, Modular & Developmental Engineering Laboratory (REMODEL), National University of Ireland Galway, Galway, Ireland

17.00 – 17.45 IES HAADEN LECTURE: Professor E Nieschlag: ‘The cultural and medical history of testosterone and the testes’
Saturday 20th November 2021

08.55 Introduction Day 2

9.00 – 9.45 ORAL COMMUNICATIONS

9.00 – 9.15 OC11 HDL structure and function in people with Type 1 diabetes differ compared to those with Type 2 diabetes as well as lean and overweight people without diabetes
KS Ahmed1, R Byrne2, I Frizelle1, A Gunness1, M Ahmed1, A McGowan1, K Moore1, A Pazderska1, C. Woods1, G Boran2, FC McGillicuddy3, J Gibney1
1Robert Graves Institute
2Department of Chemical Pathology, Tallaght University Hospital, D24
3Diabetes Complications Research Centre, School of Medicine, UCD, D4

9.15 – 9.30 OC12 Endothelial colony forming cells as an autologous cell therapy to treat diabetic and non-diabetic critical limb ischaemia
CJ Lyons, M Creane, N Soomro, T O’Brien
REMEDE, National University of Ireland Galway, Bioscience Building, Upper Newcastle Road, H91 W2TY.

9.30 – 9.45 OC13 Improving outcomes for young adults living with type 1 diabetes in Ireland: results of the D1 Now pilot randomised controlled trial
EC Morrisey1,2, M Byrne1, E McCarthy1,2, D Casey1, SF Dinneen2,3
1Health Behaviour Change Research Group, School of Psychology, National University of Ireland, Galway, H91 TK33
2School of Medicine, National University of Ireland, Galway, H91 TK33
3School of Nursing and Midwifery, National University of Ireland, Galway, H91 TK33
4Centre for Diabetes, Endocrinology and Metabolism, Galway University Hospitals, H91 YR71
9.45 – 10.30 PAEDS LECTURE: PROF MEHUL DATTANI UCL Great Ormond Street Institute of Child Health, ‘Congenital Hypopituitarism: Novel Insights into management.’

10.30 – 11.00 IES MCKENNA LECTURE
Professor Hilary Hoey, Emeritus
Professor & Past Head of Dept of Paediatrics Trinity College Dublin; Past Dean Faculty of Paediatrics RCPI ‘Challenges and Opportunities in Endocrinology’.

11.00 – 11.30 BREAK/PHARMA INDUSTRY PRESENTATIONS

11.30 – 13.00 ORAL COMMUNICATIONS

11.30 – 11.45 OC14 Sex-specific differences in HDL function and composition in patients with and without metabolic disease.
R Byrne¹, A McGowan², I Frizelle³, K Ahmed², M Ahmed², J Gibney², F McGillicuddy¹
¹Diabetes Complications Research Centre, School of Medicine, UCD Conway Institute, University College Dublin, Dublin 4, Ireland
²Departments of Endocrinology and Diabetes, Tallaght University Hospital, Tallaght, Dublin 24, Ireland

11.45 – 12.00 OC15 Forty years’ experience of neonatal thyroid stimulating hormone screening in N.I.
L Kayes³, M Darrat², J Woodside¹, K Mullan², N Abid³
¹Queen’s University Belfast, Centre for Public Health, Belfast
²Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast
³Endocrine and Diabetes Department, Royal Belfast Hospital for Sick Children, Belfast

12.00 – 12.15 OC16 Reproductive health disturbance in the era of the COVID-19 pandemic
M Maher¹, A O’Keeffe¹, N Phelan¹, LA Behan³, S Collier⁴, D Hevey⁵, L Owens²
¹Department of Endocrinology, St. James’s Hospital, Dublin
²School of Medicine, Trinity College Dublin, Dublin
³Department of Endocrinology, Tallaght University Hospital, Dublin
⁴Psychological Medicine Service, St. James’s Hospital, Dublin
⁵School of Psychology, Trinity College Dublin, Dublin

12.15 – 12.30 OC17 The novel Apholopelmachalcodes tarantula venom-derived peptide, ΔTRTX-Ac1, possess insulinotropic actions and augments GLP-1 induced reductions of appetite
A Coulter-Parkhill, VA Gault, S McClean, N Irwin
Ulster University, Cromore Road, Coleraine BT52 1SA.

12.30 – 12.45 OC18 The Endocrine Management of Differentiated Thyroid cancer at St James’s Hospital 2005–2020
JL Gibney¹, N McVeigh¹, A Khattak¹, M Toner ², E O’Regan ², J Cooke ³, ML Healy ³
¹Departments of ¹Endocrinology, ²Pathology, ³Nuclear Medicine, St James’s Hospital Dublin, James’s Street, Dublin 8

12.45 – 13.00 OC19 Abnormal glucose tolerance in women diagnosed with gestational diabetes mellitus using the International Association of the Diabetes and Pregnancy Study Groups criteria 10-years after an affected index pregnancy compared to women with normal glucose tolerance in the same period.
O Kgosidialwa¹, C Newman¹, R Biehn¹, L Carmody¹, A Alvarez-Iglesias², M McCague², P O'Shea¹, F Dunne¹
¹College of Medicine, Nursing and Health Sciences, National University of Ireland Galway, Galway, Ireland
²HRB Clinical Research Facility Galway, Galway, Ireland

13.00 Presentation of Irish Endocrine Society O’Donovan Medal (best oral presentation) and Montgomery medal (best poster presentation)

Close of meeting
Abstracts: Oral Communications

OC1. Liquid-chromatography-tandem-mass-spectrometry (LC–MS/MS) demonstrates greater aldosterone/renin ratio in unselected African-origin compared to matched European-origin participants but a similar proportion of abnormal results

KS Ahmed1, E Ali1, M Mustafá1, J Okiro1, I Frizelle1, R Dineen1, A Rakovac2, M Sherlock1, A McGowan1, LA Behan1, G Boran1, J Gibney1

1Robert Graves Institute, 2Department of Chemical Pathology, Tallaght University Hospital, D24

Hypertension is associated with low renin levels in African-origin (AO) people. Using radioimmunoassay in a retrospective study, aldosterone/renin-ratio (ARR), the screening test for primary hyperaldosteronism (PHA) was abnormal in 45% of AO compared to 25% of European-origin (EO) patients. This was a prospective study of 100 AO and 100 pair-matched EO participants. Plasma-aldosterone-concentration (PAC) and plasma-renin-activity (PRA) were measured (data currently available for 83 pairs) using the gold-standard technique of liquid-chromatography-tandem-mass-spectrometry (LC–MS/MS); PAC and direct-renin-concentration (DRC) were also measured using chemiluminescence. By LC–MS/MS, PAC was non-significantly greater, ARR is greater in AO compared to EO participants; primarily explained by low PRA. Evaluation of ARR by LC–MS/MS demonstrates a similar proportion of EU and AO participants had abnormal ARR. Using chemiluminescence, 21% of AO compared to 5% of EO participants (p < 0.05) had abnormal ARR.

|           | African = 100 | European = 100 | P value (paired t-test) |
|-----------|---------------|----------------|------------------------|
|           | (36 female)   | (36 female)    |                        |
| PAC (pmol/L) | 253 ± 214     | 212 ± 162      | 0.15                   |
| PRA (pmol/L/hr) | 0.95 ± 1.16   | 1.87 ± 2.87    | <0.005                 |
| ARR (pmol/L/ nmol/L/hr) | 445 ± 341 | 288 ± 363 | <0.01                 |
| Abnormal ARR (> 845 pmol/L/ nmol/L/hour) | 11/ 83 (13%) | 8/ 83 (10%) | NS                     |

ARR is greater in AO compared to EO participants; primarily explained by low PRA. Evaluation of ARR by LC–MS/MS demonstrates a similar proportion of EU and AO subjects with abnormal results, and potentially avoids over-investigation of possible PHA in Africans. Reference: Ahmed KS, Bogdanet D, Abadi S, Dineen R, Boran G, Woods CP, Behan LA, Sherlock M, Gibney J. Rates of Abnormal Aldosterone/Renin ratio in African-origin compared to European-origin patients; a retrospective study. Clin Endocrinol (Oxf). 2019 Apr;90(4):528–533.

OC2. Changes in vitamin D concentration and deficiency in the West of Ireland during the Covid-19 lockdown

C Moran1, M O’Sullivan1, T Griffin2,3, H Doheny4, D McCartney4, PM O’Shea1,4

1School of Biological and Health Sciences, Technological University Dublin—City Campus, Central Quadr, Grangegorman, Dublin 7, D07 XT95, Ireland, 2Centre for Endocrinology, Diabetes Mellitus and Metabolism, Saolta University Health Care Group (SUHCG), Galway University Hospital Galway, Galway, Ireland, 3School of Medicine, National University of Ireland Galway (NUIG), Galway, Ireland, 4Department of Clinical Biochemistry, Saolta University Health Care Group (SUHCG) Galway University Hospital Galway, Galway, Ireland

The COVID-19 pandemic has precipitated wide-ranging public health measures including lockdown. Vitamin D may reduce the risk and severity of infection with the SARS-CoV-2 virus, but the effects of lockdown on population vitamin D status in Ireland are unknown. This cross-sectional study compared Wintertime serum 25(OH)D in 16,725 samples analysed between October and February 2015–2020 (13,449 samples) and between Oct 2020 and Feb 2021 (3,276 samples) at University Hospital Galway (UGH). Data describing the sex, age, origin of the sample (GP ordered, hospital outpatient, hospital inpatient, nursing home resident) and the date of sampling were collected. Vitamin D deficiency was defined at the IoM (<30 nmol/l) and Endocrine Society (<50 nmol/l) thresholds. Mean total serum vitamin D and mean serum vitamin D3 concentrations were higher in 2020–21 (65.7 nmol/l and 61.7 nmol/l respectively) than in 2015–2020 (59.9 nmol/l and 55.6 nmol/l respectively) (p < 0.001). Prevalence of deficiency decreased at the <30 nmol/l threshold from 18.2% to 14.6%, and at 50 nmol/l threshold from 43.6% to 34.6%, between 2015–20 and 2020–21. Deficiency at both thresholds more common in females (p < 0.001). Deficiency was higher in inpatients (18% <30 nmol/l and 38% <50 nmol/l) and nursing home residents (17% <30 nmol/l and 33% <50 nmol/l) than in outpatients (13% <30 nmol/l; 33% <50 nmol/l) and GP patients (9% <30 nmol/l; 27% <50 nmol/l) (p < 0.001), with a trend towards greater deficiency in younger adults. Vitamin D levels have increased and deficiency has decreased between 2015–20 and 2020–21; it remains unknown whether this trend relates to lockdown or to changes in diet and supplementation practices.

OC3. Transcutaneous electrical neurostimulation of dermatome T6 lowers glucose and blood pressure: a randomised controlled study

J Ioana1,2,3, K Hutchinson4, B de Aguiar2, J Faul2, S Sreenan1

1Departments of Diabetes and Endocrinology, 2Respiratory Medicine, Connolly Hospital, Blanchardstown, Dublin 15, 3Hermitage Medical Clinic, Lucan, Dublin 20, Eurofins4, Biomnis, Dublin 18

Obstructive sleep apnoea syndrome (OSAS) is a common disorder that has been associated with autonomic nervous system disturbance, altered insulin secretion and hypertension. Neurostimulation, in particular vagal nerve stimulation and Transcutaneous Electrical Nerve Stimulation (TENS), have been shown to affect some autonomic reflexes decreasing appetite and causing weight loss. We sought to investigate whether blood sugar and blood pressure might be altered by neurostimulation. We performed a randomised controlled study of TENS in obese subjects with untreated moderate OSAS. Subjects came fasting at 9 am, were randomized to neurostimulation at either the T6 (n = 11) or S1 (n = 10) dermatome and received TENS for 60 min duration in one session. Glucose measurements were taken (at 15 min interval for 120 min) before, during and after electrostimulation. Blood pressure was measured at the start and end of the session. Glucose levels declined by a mean ± SD of 0.35 ± 0.14 mmol/L (6.3%) during neurostimulation of the T6 dermatome but were unchanged by TENS at the S1 dermatome (p <0.01 for comparison of the glucose changes between groups). Insulin levels were unchanged. There was a mean drop of a 4 ± 8 mmHg in systolic blood pressure in the T6 group (p=0.01) compared to a 4 ± 9 mmHg rise (p=0.18) in the S1 group (p<0.01 for comparison of the changes between groups). These data suggest that TENS at T6 appears to induce reductions in glucose and blood pressure in obese subjects with moderate OSAS, supporting the concept that some features of the metabolic syndrome are subject to neurologic control.
OC4. Pre-frailty in working middle-aged and older adults with and without diabetes and its association with fear of health limiting their ability to work and early retirement plans: A European overview

D Sezgin1, M O’Donovan2, R O’Caoimh2,3, A Liew4,5

1School of Nursing and Midwifery, National University of Ireland, Galway, Galway City, 26 Upper Newcastle, Galway, H91 E3YV Ireland, 2University College Cork, Cork City, Ireland, 3Mercy University Hospital, Grenville Place, Cork City, Ireland, 4School of Medicine, National University of Ireland Galway, Galway City, Ireland. 5Portiuncula University Hospital, Galway, Ireland

Diabetes mellitus is associated with increased frailty risk, resulting in loss of working days. Identification of frailty at early (pre-frailty) stage could prevent this negative outcome. This study investigates the prevalence of pre-frailty in working adults and reports the association between diabetes, pre-frailty, fear of health limiting ability to work, and plans for early retirement. We combined data from 29 European countries ranging from waves 1–8 of the Survey of Health, Ageing and Retirement in Europe (SHARE, 2004–2020). Participants aged ≥ 50 years with data on employment (including self-employment), frailty and diabetes status were included in the descriptive and logistic regression analyses. A modified version of the physical phenotype was used to identify pre-frailty. A total of 38,220 participants (mean age 55.7 ± 3.8 years) were analysed. Of these, 13,909 were pre-frail (36%), 2,264 (6%) had diabetes, 17,614 (46%) sought early retirement, and 11,406 (30%) were afraid that their health limited their ability to work. Logistic regression (adjusted for age and sex) showed that those with both diabetes and pre-frailty were more likely to have the fear of health limiting ability to work (OR: 3.92, 95% CI: 3.46–4.45), and were more likely to have plans for early retirement (OR: 1.75, 95% CI: 1.55–1.98) than those with diabetes alone. A significant proportion of middle-aged and older adults seek early retirement, potentially due to pre-frailty caused by health issues limiting their ability to work. Therefore, early identification of pre-frailty in employees with and without diabetes and implementation of tailored workplace interventions may improve the self-perception of ability to work and prevent early retirement. **Reference:** Börsch-Supan A, Brandt M, Hunkler C, Kneip T, Korbmacher J, Malter F, Schaun B, Stuck S and Zuber S (2013) Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). International Journal of Epidemiology. https://doi.org/10.1093/ije/dyt088.

OC5. Metabolic effects 15 years after haematopoietic stem cell transplant

C Mangan, D Moloney, N Phelan, M Healy

St. James Hospital James St, Dublin 8, D08 NYH1, Ireland

The metabolic effects of stem cell transplant have been well described in the early (~5 years) post transplant period, however only small data sets exist to describe the late effects of stem cell transplant. The Stem Cell Transplant (SCT) service in St James’s Hospital has been treating patients since 1984 and performs on average 160 transplants a year. Patients are followed in a dedicated late effects clinic. We designed a retrospective study to examine late effects of SCT on the endocrine and metabolic systems of this patient group. We have collected a data set of biochemical results and electronic records of patients 15 years (~12 months) post transplant. (transplantation dates 1987–2001) from 149 individuals. The median age at follow-up was 41.33 years. 131/149 had available biochemical results at this time point. Review of the electronic records in this group show that 53/149 (35.5%) were on lipid modifying therapy, 74/149 (49.6%) had a diagnosis of hypertension, 23/149 (15.4%) were diagnosed with diabetes and 46/149 (30.8%) were classified as hypothyroid. Median total cholesterol at follow-up was 5.16 mmol/L, HDL 1.25 mmol/L, LDL 2.64 mmol/L and triglyceride 1.725 mmol/L. 45/131 (34.3%) had triglyceride levels > 2.3 mmol/L. Median TSH was 2.06 with 9/131 (6.8%) having a TSH > 4.2. This young cohort has a high burden of hypertension, metabolic disease and thyroid dysfunction despite medical intervention. This highlights the need for specialised MDT care.

OC6. Mucosal associated invariant T cells are associated with insulin resistance in childhood obesity and can disrupt insulin signaling via interleukin-17

R Bergin1, D Kinlen2, NK-Mehtha2, D Cody, AE Hogan1,2,3, D O’Shea1

1Lonsdale Human Health Institute, Maynooth University, Co. Kildare, 2St Vincent’s University Hospital, Dublin 4, 3National Children’s Research Centre, Children’s Health Ireland Crumlin, Dublin 12

Mucosal Associated Invariant T (MAIT) cells are an abundant population of innate T cells. When activated, MAIT cells rapidly produce a range of cytokines including IFNγ, TNFa and IL-17A. Several studies have implicated MAIT cells in the development of metabolic dysfunction, but the mechanisms through which this occurs are not fully understood. We hypothesized that MAIT cells would be associated with insulin resistance in children with obesity, and further would impact on insulin signalling through their production of IL-17A. We investigated MAIT cell cytokine profiles in a cohort of 50 children with obesity and 50 healthy age/sex matched controls using flow cytometry. We then used a cell-based model to determine the direct effect of MAIT cells and IL-17A on insulin signaling and glucose uptake. Our data shows that children with obesity display increased MAIT cell frequencies, and once activated these produced elevated levels of both TNFa and IL-17A. The IL-17A producing MAIT cells were associated with an elevated HOMA-IR. The MAIT cell secretome from subjects with obesity resulted in reduced glucose uptake when compared to the secretome from healthy controls. Finally, we demonstrated that recombiant IL-17A blocked insulin mediated glucose uptake via inhibition of pAKT and pERK. Collectively these studies provide further support for the role of MAIT cells in the development of metabolic dysfunction and suggest an IL-17A mediated impact on intracellular insulin signalling is responsible.

OC7. Relative contribution of oral and inhaled glucocorticoid exposure to risk of adrenal insufficiency in asthma treated with fluticasone propionate

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The aim of this study was to establish the relative contribution of inhaled glucocorticoid (ICS) and oral glucocorticoid (OCS) exposure to the risk of adrenal insufficiency (AI) in patients with asthma. The INCA™ device, an electronic monitoring device which records inhaler use and technique, was used to calculate individualised cumulative ICS exposure over 32 weeks. Morning serum cortisol concentration
was measured at week 32 using a second-generation immunoassay, and participants stratified by risk of AI using locally validated cortisol thresholds. Eighty participants were included; 20% (52) of whom were had AI (cortisol < 130 nmol/l). There was a negative correlation of morning serum cortisol and both cumulative OCS exposure (r=-0.4, p=0.0002) and weight-based OCS exposure (r=-0.41, p=0.0002). The risk of AI increased with each standard pulse OCS course received [OR 1.24 (CI 1.1 – 1.4 p=0.003)]. Prescription of high-dose ICS (fluticasone propionate (FP) > 500 mcg/day) increased the risk of AI [OR 4.63, p=0.024, CI 1.2 – 17.5]. Morning cortisol negatively correlated with ICS exposure, expressed as either mg FP [r = -0.25, p=0.0283] or mg/kg FP exposure [r = -0.26, p=0.019]. Logistic regression analysis, categorising patients as high-risk AI (cortisol < 130 nmol/l) or not (>130 nmol/l), showed that cumulative ICS exposure remained a significant predictor of AI even when OCS exposure was controlled for (OR 2.17 per 1 mg/kg increase in cumulative FP exposure, [CI 1.11 – 4.23] p=0.023).

Our data suggests that AI is common amongst patients exposed to high-dose ICS, and that both intermittent courses of OCS and prolonged ICS exposure contribute independently to this risk.

### OC8. Outcomes of a National cohort of 1000 pregnancies in women with pre-gestational diabetes type 1 and type 2: 2015–2020

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Pre-gestational diabetes mellitus increases adverse pregnancy outcomes. We began data collection nationally in 2015 and we now report data from 2015–2020. All 20 antenatal units were invited to participate and information was collected on pregnancy preparation, diabetes treatment and neonatal outcomes. Data was available on 1043 pregnancies from 18 centers. Thirty-three per cent (n=660) and 34% (n=340) of pregnancies occurred in women with type 1 and type 2 diabetes respectively. Mean (±sd) age, weight and body mass index were 32.2(5.9) years, 77.6(16.7) kg and 28.9(7.1) kg/m² respectively. The majority of women were Caucasian (n=673, 84%). Overall women were poorly prepared for pregnancy; 31% attended pre-pregnancy care (PPC), mean (sd) first trimester haemoglobin A1c was 59±19 mmol/mol and 52% (n=541) received pre-conceptual folic acid. The majority were treated with multiple daily injection and 8.5% (n=89) received pump therapy. Eight percent (n=54) used continuous glucose monitoring. Suboptimal pregnancy preparation translated into poorer pregnancy outcomes. Livebirth and miscarriage rates of 84% and 14% were comparable to the background population. The still birth rate was 9/1000, 4 times higher than the national rate (2.2/1000). The perinatal mortality rate was 11/1000, 3 times higher than the national rate of 3.8/1000. More than half (n=470) of infants were born large for gestational age and the congenital malformation rate of 38/1000 was × 1.5 times the background population rate, (26/1000). In summary neonatal outcomes in the congenital malformation rate of 38/1000 was × 1.5 times the background population rate, (26/1000). In summary neonatal outcomes in the congenital malformation rate of 38/1000 was × 1.5 times the background population rate, (26/1000). In summary neonatal outcomes in the congenital malformation rate of 38/1000 was × 1.5 times the back-ground population rate, (26/1000).

The still birth rate was 9/1000, 4 times higher than the national rate (2.2/1000). The perinatal mortality rate was 11/1000, 3 times higher than the national rate of 3.8/1000. More than half (n=470) of infants were born large for gestational age and the congenital malformation rate of 38/1000 was × 1.5 times the background population rate, (26/1000). In summary neonatal outcomes in the congenital malformation rate of 38/1000 was × 1.5 times the background population rate, (26/1000). In summary neonatal outcomes in the congenital malformation rate of 38/1000 was × 1.5 times the background population rate, (26/1000).

### OC9. In type 1 diabetes, lipidomic profiling demonstrates differing phosphatidylcholine concentrations in participants with increased carotid intima media thickness (CIMT)

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Cardiovascular mortality remains increased in type-1 diabetes (T1DM) despite an apparently protective lipid profile. Lipidomic studies mass spectrometry to characterise lipid pathways in much greater detail than previously possible. Carotid-intima-media-thickness (CIMT) was measured in 250 participants with T1DM. Z-scores (standard-deviation from predicted value for age-and-sex) were derived. Subjects were divided equally into Z-scores above (CIMT+) and below (CIMT-) the T1DM median. A targeted metabolomics approach (Biocrates- AbsoluteQuant®) assay was applied to measure 188 metabolites including amino acids, biogenic ammopes, acylcarnitines, (lyso-) phosphatidylcholines, sphingomyelins and hexoses. There were no significant between-group differences in age, gender, diabetes duration, blood pressure, HbA1c and LDL-cholesterol. Six metabolites in the phosphatidylcholine class were lower in participants with increased CIMT (examples below).

| Metabolite | Ratio (Better vs. Worse CIMT) | p-value | q-value |
|------------|-----------------------------|--------|--------|
| PC ae C42:0 | 1.103 | 0.007 | 0.007 |
| PC ae C30:0 | 1.124 | 0.003 | 0.155 |
| PC ae C40:6 | 1.099 | 0.002 | 0.135 |
| PC ae C44:4 | 1.121 | 0.001 | 0.087 |

ANOVA-with-post-hoc-testing; to reduce false discovery rate (FDR) a q-value < 0.2 was applied.

In summary, while classical cardiovascular risk factors were not associated with increased CIMT in T1DM, a number of phosphatidylcholine moieties were lower. As these have been linked inversely with cardiovascular disease in non-diabetic populations, further investigation is required.

### OC10. Diabetic model development and investigation of the therapeutic effect of MSC-scaffold bio-complex

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Mesenchymal stromal cells (MSCs) emerged as a promising therapeutic agent for tissue regeneration due to their multifunctional properties. To evaluate the therapeutic effect of human MSC-scaffold bio-complex on diabetic preclinical model, we attempted to develop a diabetic model using immunodeficient nude mice, and investigated the therapeutic effect of MSCs-scaffold bio-complex. Animals were induced to hyperglycaemia using streptozotocin (40 mg/Kg) and wounds were treated as per groups: Sham, scaffold only group, MSC grown on scaffold group, and MSC grown on scaffold under macromolecular crowding group. Wound closure and morphometric parameters were assessed.60% of mice successfully developed diabetes (≥ 13.9 mmol/L), exhibited mild
diabetic signs (polydipsic and polyuria), no loss of body weight and fatality. Gross view of wounds on day 7 showed no significant difference in wound closure, however, scabs were observed on the wound bed at day 7, indicating scaffold biodegradation maybe slow. Histology and immunohistochemistry analysis revealed no significant difference in re-epithelialization, granulation tissue area, blood vessel density and ECM deposition between the four groups. Each group has 1-2 wounds completely re-epithelialized on day 7, suggesting the injury model is not severe enough. Although current data did not show significant therapeutic effects of MSC-scaffold bio-complex in diabetic wound healing, multifactor including degree of hyperglycaemia, scaffold interference, cell dose, and sample size may affect the results and need to be further optimised. These results provided fundamental for developing a diabetic preclinical model for studying human cells and considerations for investigating the therapeutic effect of a cell therapy product.

**OC11. HDL structure and function in people with type 1 diabetes differ compared to those with type 2 diabetes as well as lean and overweight people without diabetes**

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Similarities and differences exist in the mechanisms through which atherosclerosis is increased in type-1 (T1DM) and type-2 (T2DM) diabetes. We have reported (1) increased HDL-particle-size in T1DM, and increased HDL-cholesterol-efflux-capacity (HDL-CEC), the process whereby cholesterol is transported from the vessel-wall to HDL-particles and ultimately the liver for excretion; HDL-CEC better predicts cardiovascular events than HDL-cholesterol (HDL-C). We aimed to determine whether these observations are specific to T1DM. We compared HDL-particle number and size (nuclear-magnetic-resonance) and HDL-CEC (¹H-cholesterol efflux from J774-macrophages to HDL) in 4 age-and-gender-matched groups (n=75-per-group); (a)T1DM; (b)BMI-matched(lean)T1DM-controls; (c)T2DM; (d)BMI-matched(overweight) T2DM-controls. HDL-C was greater in T1DM compared to T2DM and overweight control subjects. HDL-particle size and HDL-CEC were greater in T1DM compared to all other groups.

| HDL-C (mmol/l) | HDL Particle number (µmol/L) | HDL Particle size (nm) | HDL-CEC (% of efflux) |
|----------------|-----------------------------|-----------------------|-----------------------|
| T1DM (n=75, 38 female; age 41±9 y; BMI 26±2 kg/m²) | 1.6±0.5 a | 30.2±8.3 | 9.84±0.60 b | 14.5±2.7b |
| Lean control (n=75, 37 female; age 42±9 y; BMI 26±2 kg/m²) | 1.5±0.4 | 34.3±7.1 | 9.44±0.55 | 12.5±3.0 |
| T2DM (n=75, 40 female; age 42±9 y; BMI 35±6 kg/m²) | 1.1±0.3 | 31.9±5.1 | 9.18±0.38 | 12.1±2.5 |

ANOVA-with-post-hoc testing: Mean ± SD

P<0.05 vs T2DM and overweight control

Increased HDL-particle-size and HDL-CEC are specific to T1DM; understanding of the causes and consequence of these effects will enhance understanding of atherogenesis in this high cardiovascular risk group. Reference: (1) Ahmed MO, Byrne RE, Pazderska A, Segurado R, Guo W, Guinness A, Frizelle I, Sherlock M, Ahmed KS, McGowan A, Moore K, Boran G, Mcgillicuddy FC, Gibney J. HDL particle size is increased and HDL-cholesterol efflux is enhanced in type 1 diabetes: a cross-sectional study. Diabetologia. 2021 Mar;64(3):656–667.

**OC12. Endothelial colony forming cells as an autologous cell therapy to treat diabetic and non-diabetic critical limb ischaemia**

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In critical limb ischaemia (CLI) the arteries in the lower limb become blocked due to the build-up of an atherosclerotic plaque, resulting in rest pain, and potentially leading to amputation and possibly death. 20–25% of CLI patients are considered ‘no option’ and given conservative management. Endothelial colony forming cells (ECFCs) have been shown to form vessels in vitro and in vivo and could be used as a therapy for these ‘no-option’ patients. In this study peripheral blood-ECFCs were isolated from healthy, diabetic, CLI and diabetic-CLI patients. A colony count was carried out 14 days post cell isolation. ECFCs from all donor groups were phenotypically characterised and their growth kinetics and in vitro angiogenic capacity (scratch wound and Matrigel tubulogenesis assays) was compared to assess the feasibility of an autologous ECFC therapy for CLI. All data were tested for normality using a Shapiro–Wilk test and then assessed using a one-way ANOVA or Kruskal–Wallis test. There were significantly more colonies in the diabetic-CLI group compared to the healthy control (P=0.0094). No significant difference was observed in the growth kinetics between donor groups (population doubling time (P=0.3485) and maximum cumulative population doubling (P=0.2238)). Similarly, there was no significant difference in their 2D migration (P=0.4249) and 2D tubulogenic capacity (tube number P=0.0517, number of
OC13. Improving outcomes for young adults living with type 1 diabetes in Ireland: results of the D1 now pilot randomised controlled trial

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Young adults (18–25 years) living with type 1 diabetes often disengage with diabetes services leading to higher blood glucose levels and a higher risk of complications. D1 Now is a novel intervention, designed to support self-management and clinic engagement and improve outcomes in this group. The first D1 Now pilot randomised controlled trial (RCT) aimed to gather and analyse acceptability and feasibility data to allow us to (1) refine the D1 Now intervention, and (2) determine the feasibility of a future definitive RCT. Four diabetes centres (3 intervention arms: 1 control arm) participated and delivered the study protocol despite a global pandemic. Recruitment commenced in October 2019 and follow-up finished in January 2021. Quantitative data collection occurred at baseline and 12 months. Qualitative data collection occurred at 6, 9 and 12 months. We recruited 57 young adults (48 in the intervention arm; 9 in the control arm). A total of 49% of eligible young adults agreed to participate. Loss to follow-up over the 12 months was low at 12%. The psychosocial outcome measures were considered acceptable. We had incomplete HbA1c outcome measurement due to COVID-19 related difficulties. Two of the three intervention arm components were deemed feasible and acceptable with some modifications felt to be necessary to the final intervention component. Recruitment and retention of study participants exceeded expectations in a young adult cohort. Some modifications to research processes and intervention components are needed but with these in place a full scale RCT of the D1 Now intervention can be undertaken.

Registry number: ISRCTN74114336.

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OC14. Sex-specific differences in HDL function and composition in patients with and without metabolic disease

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OC15. Forty years’ experience of neonatal thyroid stimulating hormone screening in N.I

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Northern Ireland was one of the first participating sites in the UK national screening programme for congenital hypothyroidism (CHT) 40 years ago. This study aimed to explore any changing patterns in incidence. Enrolment in the programme has remained high throughout (> 98%). The cut-off value for neonatal thyroid stimulating hormone (nTSH) on day 5–8 was changed in 1995 from 10 mU/L to 8 mU/L to improve sensitivity and specificity. In NI there was an increased incidence of CHT with 26 cases/100,000live births in 1981 vs 71/100,000 in 2019 (p < 0.00001). Results are similar to recent Republic of Ireland data (65/100,000). In ten year blocks the average incidence was 28, 42, 65 and 73/100,000 live births (1980s, 1990s, 2000s and 2010s respectively). The median gestational age for CHT did not change significantly: 40 weeks (IQR 39–41) in 1980s vs 39 weeks (IQR 38–40) in 2010s. The most common chromosomal abnormality was Trisomy 21 (4.4% of cases) with little change in this over the last 30 years. Possible explanations for the increase seen here and elsewhere include changes in cohort ethnicity, iodine status, unquantified environmental changes (e.g. perchlorate exposure), assay cut off change or assay drift. Ethnicity is not captured in this data, but NI census data shows no major change (95% British/Irish). When the data was reanalysed excluding cases with nTSH 8–10 mU/L there was still a significant increase in incidence (p < 0.00001). Assay drift is possible but unlikely as our laboratory is UKAS accredited and is regularly quality assured.

OC16. Reproductive health disturbance in the era of the COVID-19 pandemic

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OC17. The novel Aphonopelmachalodes tarantula venom-derived peptide, ∆TRTX-Ac1, possess insulinotropic actions and augments GLP-1 induced reductions of appetite

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Glucagon-like peptide-1 (GLP-1) mimetics are clinically approved for the treatment of diabetes and obesity, based largely on efficient glucose-induced insulin secretion and suppression of appetite. In the current study, effects of the recently described Aphonopelma californicum tarantula venom peptide, Δ-theraphotoxin-Ac1 (ΔTRTX-Ac1), on insulin secretion was investigated as well as the ability of this peptide to augment GLP-1 receptor (GLP-1R) induced benefits on glucose homeostasis and appetite suppression in mice. Enzymatic stability of synthetic ΔTRTX-Ac1 was examined in murine plasma. In vitro insulin secretion studies (10^{-12} – 10^{-6} M; 20 min) were performed in BRIN-BD11 beta-cells. Acute in vivogluco-regulatory and satiety actions of ΔTRTX-Ac1 alone (25–250 nmol/kg bw) or in combination with the GLP-1 mimetic exenatide (0.25–25 nmol/kg bw), were investigated in C57BL/6 mice. ΔTRTX-Ac1 was stable against plasma enzyme degradation for up to 6 h. In addition, ΔTRTX-Ac1 (10^{-6} M) significantly increased (P < 0.05-P < 0.001) insulin secretion from BRIN-BD11 cells at 5.6, 11.1 and 16.7 mM glucose. When injected co-jointly with glucose in mice at an elevated dose of 250 nmol/kg, ΔTRTX-Ac1 decreased (P < 0.001) blood glucose concentrations during a 60-min experimental period. Conversely, ΔTRTX-Ac1 was unable to augment the glucose-lowering actions of exenatide. However, at doses of 25 or 250 nmol/kg, ΔTRTX-Ac1 reduced (P < 0.05-P < 0.001) food intake in overnight fasted mice. Moreover, ΔTRTX-Ac1 significantly (P < 0.05-P < 0.001) augmented the appetite suppressive actions of exenatide. ΔTRTX-Ac1 is a tarantula venom-derived peptide with a biological action profile of therapeutic interest for diabetes and obesity, both alone and in combination with GLP-1R signalling.

OC18. The endocrine management of differentiated thyroid cancer at St James’s Hospital 2005–2020

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Management of thyroid cancer has changed markedly over the past 2 decades, particularly following the revision of the American Thyroid Association guidelines in 2015 advocating a more conservative approach to treatment and specifically advising that radio-iodine (RAI) be reserved for high-risk patients. Our Endocrinology Unit provides a fully integrated management pathway for patients with differentiated thyroid cancer (DTC) including administration of RAI where appropriate, year 1 surveillance and lifelong follow-up. The aim of this retrospective study was to determine temporal changes in referral patterns of DTC, pathological stage at diagnosis and RAI utilisation. Excluding microcarcinomas (DTC < 1 cm), 1009 patients were referred to the service between 2005 and 2020; 497 RAI treatments were administered to 411 individuals over this time. Referral numbers increased annually (17 in 2005, 89 in 2019), while the proportion receiving RAI decreased (94% in 2005, 30% in 2019). Consequently the number of patients receiving RAI annually increased until 2016 since when numbers stabilised with a median of 36. Reviewing the TNM (tumour node metastases) classification of the RAI cohort, 9 patients in 2005 were PT3 or above, 3 with distant metastases. In 2019, 26 were PT3 or above, 10 with distant metastases. In summary, referrals with DTC to our unit have increased more than fivefold over 15 years, with increasing case complexity. RAI utilisation is reserved for 30% of patients deemed high-risk. Further examination of the cohort will include reflection on treatment outcomes in both higher and lower risk patients with and without RAI utilisation.

OC19. Abnormal glucose tolerance in women diagnosed with gestational diabetes mellitus using the International Association of the Diabetes and Pregnancy Study Groups criteria 10-years after an affected index pregnancy compared to women with normal glucose tolerance in the same period

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Women with a history of gestational diabetes mellitus (GDM) have an increased risk of developing abnormal glucose tolerance (AGT) in later life. This study aimed to assess the prevalence of AGT ten years after an index pregnancy with GDM diagnosed and treated using the IADPSG criteria. This was a prospective cohort follow-up study of 37 and 107 women diagnosed with and without GDM respectively between June 2010 and December 2010 in our centre. AGT (prediabetes or T2DM) was defined using the ADA criteria. Twenty (54.1%) women with GDM compared to 12 (11.2%) women with normal glucose tolerance (NGT) at index pregnancy had AGT (p < 0.001). Baseline demographics and pregnancy outcomes were similar between groups. In the GDM group, 10 (27.0%), seven (18.9%) and three (8.1%) women had impaired fasting glucose (IFG), impaired glucose tolerance (IGT) and T2DM respectively. In the NGT group two (1.9%), three (2.8%) and one (0.9%) woman had IFG, IGT and T2DM respectively. An additional six participants in the NGT group had a normal OGTT but HbA1c in keeping with prediabetes. Insulin treatment during pregnancy, older age at diagnosis and a higher booking BMI were associated with a higher risk of AGT. Women with AGT had a poorer metabolic profile compared to those with NGT. Despite treatment in pregnancy for GDM, women diagnosed using the IADPSG criteria remain at a higher risk for developing AGT a decade after diagnosis similar to that found in the HAPO follow-up study. Continued efforts are needed to address modifiable risk factors.

Abstracts: Invited poster presentations

P1. Impact of IGF-1 and GH assay type on the interpretation of growth hormone day curve results in the assessment of acromegalic disease activity

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Plasma growth hormone (GH) and IGF-1 concentrations are critical in the assessment of biochemical control of Acromegaly. International guidelines recommend a target of GH < 1.0 ng/mL, together with a normalised IGF-1 level to define biochemical cure. GH < 2.5 ng/mL has been associated with normalisation of mortality. Discordant GH/IGF-1 results are common however, and present a challenge to the clinician. We aimed to determine:

1. The rates of discordance between plasma IGF-1/GH concentrations in monitoring of acromegaly
2. The impact of IGF-1 and GH assay change on rates of discordance
3. The correlation between GH/IGF-1 using different assays.
Between 2000–2020 137 GHDC were included in analysis; 86 GHDC following change to the IDS-iSYS 2000 IGF-1 assay and 51 GHDC following change to the IDS-iSYS GH assay. The GH assay changed from Immulite 2000 to IDS-iSYS GH in 2013. Discordance was defined as GH < 1 ng/ml or < 2.5 ng/ml and an IGF-1 above the upper limit of normal (ULN). Using the Immulite-2000 assay, discordantly elevated IGF-1 occurred in 6.9% of patients, with a mean GHDC < 1 ng/ml and 26.7% with a mean GHDC < 2.5 ng/ml. Using the IDS-iSYS discordantly elevated IGF-1 occurred in 25.4% of patients with a mean GHDC < 1 ng/ml and 58.8% with a mean GHDC < 2.5 ng/ml (p = 0.0002 vs. Immulite). Area under the curve for GH during a GHDC (GHDC-AUC) was calculated and was statistically higher in those with discordantly elevated IGF-1 compared with those with concordantly controlled results (p = 0.005). GHDC-AUC correlated with IGF-1%ULN before and after IGF-1 assay change (Spearman’s r = 0.39 Immulite and r = 0.59 IDS-iSYS, p < 0.0001). Discordance between GH and IGF-1 values are common and differ depending on GH cut-offs and assays used.

P2. HbA1c testing following transition of people with uncomplicated type 2 diabetes from outpatient diabetes clinics to general practice

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To inform the development of a transition of care protocol we aimed to identify when people with uncomplicated type 2 diabetes had their first HbA1c test following transition of care from an outpatient diabetes clinic to their GP. The diabetes management system at Galway University Hospital diabetes clinic was searched for people with type 2 diabetes who were transitioned to general practice between January and December 2018. The electronic laboratory database was searched to identify the first HbA1c recorded within 2 years of date of transition. 119 people with T2D were transitioned during the study period. Preliminary analysis found that no HbA1c was recorded in 12% (14/119) following transition. Of the 105 (88%) who had a HbA1c done post transition, the median time of first HbA1c recorded was 169 days (range 41 – 727 days). Thirty nine percent (41/105) did not have a HbA1c recorded within 7 months of transition. Age, gender and GMS status were not associated with having a HbA1c test done within 7 months following transition. These findings suggest that many people with uncomplicated type 2 diabetes are not meeting current clinical recommendations that HbA1c should be checked at least twice a year. Although the focus here is on post-transition, it is likely similar findings will be found pre-transition of care when attending the outpatient clinic. Communicating to patients the importance of regularly monitoring their HbA1c is important. Sending patients a reminder, especially at times of transition of care, might improve awareness and attendance and needs further evaluation.

P3. Hypoglycaemia in a metastatic gastrin secreting pancreatic NET on insulin pump therapy

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A 64-year-old female presented with recurrent episodes of symptomatic hypoglycaemia. She was on insulin pump therapy following a pancreaticoduodenectomy + splenectomy in 2002 for gastrin secreting pancreatic NET (pNET). Disease recurrence in 2011 resulted in multiple therapies including chemotherapy, hepatic resections, TACE and Peptide Receptor Radionuclide Therapy (PRRT) however insulin requirements were always stable at 30 units per day with no previous episodes of fasting hypoglycaemia. Genetic screening for an MEN pre-disposing mutation was negative. Despite suspension of insulin delivery episodes of fasting hypoglycaemia were confirmed on Dexam G6 ® CGM (Dexcom, San Diego, USA). Repeat imaging revealed increased tumour burden evidenced by, increased size of the largest liver metastasis, several mesenteric lymph nodes and increased peri-tonal deposits. She was admitted for management of hypoglycaemia and further investigation. A 72 h fast confirmed hyperinsulinaemic hypoglycaemia at 24 h with venous glucose of 2.2 mmol/L, C peptide of 2.16mcg/L(< 1.1 mcg / L) and insulin level of 5.6mu/L (< 3 mU/L) suggesting insulin secretion from her previous gastrin secreting NET. No surgical or chemotherapeutic options were viable, and she was referred for PRRT therapy. Diazoxide was unsuccessful due to intolerable nausea. PRRT therapy resulted in elimination of symptomatic hypoglycaemia and resumption of her usual insulin requirements. This case highlights the potential for pNET’s to change biological activity with disease progression. Polysecretory NET is typically associated with MEN syndrome or in rare cases such as this advanced sporadic disease.1) This is the second published case of metastatic insulinoma in a patient on insulin pump therapy. Reference: The Journal of Clinical Endocrinology & Metabolism, Volume 101, Issue 2, 1 February 2016, Pages 445–452, https://doi.org/10.1210/jc.2015-2436 Authors have no conflicts of interest to declare.

P4. Case report: Transient postpartum hypopituitarism

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We report a case of acute hypopituitarism following profound hypotension during crash caesarean section for acute fatty liver disease in pregnancy (AFLP). Background was of infertility with cabergoline for idiopathic hyperprolactinaemia. This 39-year-old female presented at 38 weeks gestation with jaundice and abdominal pain (Bilirubin 209 umol/L (0–21), ALP 452 U/L (30–130), AST 107 U/L (0–32)). AFLP was diagnosed. Foeto-maternal deterioration resulted in crash caesarean section. Peri-operative blood loss was 400 mls. Post-operatively, she went to ITU with multi-organ failure and further haemorrhage. Refractory hypoglycaemia occurred inconsistent with degree of liver abnormality. Midwives noted agalactorrhoea. Cortisol and ACTH levels were low at 49 nmol/L and 7 ng/L, respectively. Prolactin dropped from 3800 to 727 mU/L. Free T4 was 6.4 pmol/L (12–22); TSH 0.93 mU/L (0.2–4.2). MRI pituitary showed subtle increased signal (physiological vs subacute haemorrhage). Acute hypopituitarism was diagnosed and steroids commenced with rapid restoration of blood pressure and glucose. Six week review showed baseline cortisol 275 nmol/L which, following synthetic ACTH, rose to 371 nmol/L. Thyroid/gonadal-pituitary axes normalised. MRI changes seen post-partum completely resolved. Three months subsequently, menses had returned. Assessment showed complete resolution (Cortisol 564 nmol/L at 30 min following ACTH (> 450); normal T4, prolactin, IGF-1, gonadotrophins). Sheehan’s Syndrome results from ischaemic necrosis of the anterior pituitary, secondary to haemorrhage/hypovolaemia, causing hypopituitarism. Onset following delivery varies. Prevalence is 1/100,000 deliveries. Transient hypopituitarism mimicking Sheehan’s is even rarer. In massive post-partum haemorrhage, Sheehan’s should be considered but be mindful that function can very infrequently return to normal.
P5 Case report: Subacute thyroiditis post viral vector vaccine for Covid-19

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The ChAdOx1 nCoV-19 vaccine (AZD1222 produced by AstraZeneca Vaxzevria®) is an adenoviral vector vaccine that works by delivering the genetic code of the SARS-CoV-2 spike protein to human cells to provoke an immune response. Subacute thyroiditis (de Quervain’s thyroiditis) is an inflammatory disorder of the thyroid gland characterised by a painful thyroid gland, elevated inflammatory markers and abnormal thyroid function tests- often a thyroxin followed by a hypothyroid phase. Sub-acute thyroiditis is most often preceded by a viral infection but there have also been case reports of thyroiditis following vaccinations. A 50-year-old female presented with malaise and neck pain 6 days post dose 1 of ChAdOx1 nCoV-19 vaccine. Laboratory investigations showed a thyroid stimulating hormone (TSH) of 0.03 mU/l with an elevated free T3 of 6.51 pmol/l and normal free T4 of 18 pmol/l. CRP was elevated at 73 mg/L. Repeat bloods 3 months later showed overt hypothyroidism- TSH 47.37 mIU/l, free T4 9 pmol/l. TSH receptor antibody was negative. She was referred to our endocrinology department and commenced on thyroxine treatment for a 6 month period. There are a growing number of published case reports of thyroiditis post covid-19 vaccination. The mechanism of development of thyroiditis post vaccination is unclear, but it is thought that cross recognition of virus and healthy thyroid cell antigens may play a role. Knowledge of this potential adverse effect will lead to earlier diagnosis and appropriate management as we continue to battle the covid-19 pandemic worldwide. Authors have no conflicts of interest to declare.

P6 U500 insulin in the management of severe insulin resistance in pregnancy

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Severe insulin resistance syndromes are a rare cause of diabetes mellitus. Pregnancy increases insulin resistance and frequently necessitates massive insulin doses to achieve strict glycaemic targets. We present a case of a 31 year old female, referred for assessment of type 2 diabetes mellitus, diagnosed aged 24. Examination revealed a lipodystrophic phenotype. The patient had radiographic evidence of ectopic fat and clinical and biochemical evidence of insulin resistance. Genetic testing for partial lipodystrophy (LMNA, PPARG, PLIN1 and CIDEC) revealed a heterozygous mutation in PPARG of unknown clinical significance. Family members were unavailable for screening. In anticipation of conception, insulin was added to metformin, requiring a total daily dose (TDD) of > 3 units/kg to achieve a HbA1c of 59 mmol/mol at 4 weeks gestation. By 14 weeks gestation, insulin requirements had increased to over 1500 units/day, requiring up to 30 separate injections due to the volume administered. In anticipation of increasing insulin requirement, the patient was converted from U100 to U500 insulin at week 16. TDD dropped initially to 700 units, administered in three injections (HbA1c 42 mmol/mol), rising to a peak TDD of 2400 units at 29 weeks gestation (HbA1c 47 mmol/mol). At delivery, TDD was 800 units. The baby required neonatal unit admission for respiratory support and glucose monitoring. This case illustrates the safety and utility of U500 in a syndromic severe insulin resistance patient, with implications for the management of non-syndromic insulin resistant patients in pregnancy.

Abstracts: Poster presentations

Adrenal/Pituitary/Thyroid

P7 Sublethal hyperthermia in combination with heat shock protein inhibitors as an adrenal sparing, targeted disruption of hyper functional nodules in APA’s

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Primary Aldosteronism (PA) is the most common secondary cause of hypertension. Radiofrequency ablation has shown utility in managing unilateral PA, but collateral lethal damage to the adrenal makes it unsuitable for treatment of bilateral disease. Sub-lethal hyperthermia (45 °C for 30 min) alone and/or combined with heat shock protein inhibitors (HSPi) presents as an adrenal sparing alternative for unilateral and bilateral disease, to target and disrupt aldosterone hypersecretion, with predicted reduced collateral damage. Steroidogenic adrenocortical cell lines (H295R + HAC15) were co-treated with HSPi (Novobiocin 100 μM OR Gantespib 2 μM) and sublethal hyperthermia (water-bath). Cells were stimulated with forskolin(10 μM) and angiotensin II (10 nM) with cell death (Annexin V/Propidium Iodide flow cytometry) and steroid secretion (HPLC Mass Spectrometry) assessed 18 h and 7-days post-treatment. Proliferation was assessed over 7-days using xCELLigence Real-Time Cell Analysis. Sub-lethal hyperthermia significantly reduced Aldosterone secretion (Mean Difference -11533 pmol/L vs ctrl p < 0.001), which was enhanced with novobiocin co-treatment. Cell death did not occur with use of sub-lethal hyperthermia as a monotherapy or in combination with HSPi co-treatment (P > 0.05 vs ctrl). 7-day recovery of HAC15 hyperthermia treated cells illustrated a decreased cell number (Mean difference -486.667 ± 105741 cells P < 0.05 vs ctrl), with xCELLigence data confirming a decreased rate of proliferation ~80 h post treatment. Sublethal hyperthermia alone and with HSPi-treatment significantly decreased steroidogenesis 18 h post-treatment and proliferation 80 h post-treatment. Sub-lethal hyperthermia with HSPi may present as a targeted adrenal sparing alternative to ablative therapy by disrupting the hypersecreting functional nodule while (i) mitigating excessive damage to surrounding healthy tissue (ii) maintaining normal adrenocortical function.

P8 Treatment planning using a 3D simulated environment to guide and inform precision delivery of thermal therapy to aldosterone producing adenomas

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Radiofrequency and microwave thermal ablation offer minimally invasive therapy for primary aldosteronism, however current thermal ablation systems are optimised for the treatment of malignancy in large organs. Using the software “3D Slicer”, this research investigated the potential role of 3D reconstruction of adrenal glands and the surrounding tissues in treatment planning for thermal ablation and identified safe pathways for thermal probe insertion. Segments were performed using diagnostic images (particularly 11C-metomidate PET/CT scans) from patients, recruited under informed consent, with known bilateral adrenal hyperplasia or adrenal nodules. 3D models were constructed of the adrenal glands, intra-adrenal tumour and adjacent organs using the software “3D Slicer”. Critical structures were identified and the safest path for probe insertion was established in each model taking into account the surrounding anatomy and the specific size and shape of each target adrenal gland. Models were completed to a high standard and independently reviewed by a radiographer. Three probe insertion options were identified, although they were not all feasible in every patient. Probe insertion options included through the skin, through the liver and through the base of the lung. These 3D models can be integrated into simulation software and used in the further development and research of the delivery of thermal therapy to aldosterone producing adenomas. Safe pathways for probe insertion to reach intra-adrenal tumours can be established using 3D models created from diagnostic images, specifically 11C-metomidate PET/CT scans. This can help to maintain minimal damage to surrounding tissues and to assist in complete and safe destruction of intra-adrenal nodules in a minimally invasive manner. These models can be further integrated into simulation software to aid in the development of thermal probes, heat maps and predict patient outcomes.

P9 To evaluate the migration of monocytes to adrenocortical cells and polarization of migrated monocytes

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Adrenocortical carcinoma (ACC) is an aggressive steroidogenic cancer which carries a 5-year prognosis of <10%. The typically high cortisol environment of ACC causes a different immune cell milieu from other cancers. Consequently, ACC lacks lymphocyte infiltration demonstrating predominant macrophage / monocyte infiltration. This has implications (i) for efficacy of immune checkpoint inhibitors, and (ii) for tumour growth from monocyte/macrophage support. We hypothesised monocytes migrate to ACC cells and polarize to an M2 phenotype, which supports tumour growth. We investigate (i) the migration of monocytes to ACC and (ii) the polarization of migrated monocytes. Monocytes were isolated from peripheral blood through a “no touch” magnetic bead-based technique. Sort efficiency and purity was confirmed using flow cytometry. Monocytes were characterised by flow cytometry using CD45, HLADR, CD14 and CD16. Monocyte polarization was determined for M2 by validated surface phenotype. Migration to the ACC cell line H295R was modelled using a transwell system, and evaluated at 24 and 48 h. Within 24 h, 67% of monocytes had migrated to the lower-chamber, of which 13% had associated with H295R cells, compared to 31% migration the control group (p<0.005). At 48 h, 67% had migrated to the lower-chamber and 45% had associated with H295R cells. Monocytes associated with ACC cells were predominantly of the M2 phenotype. These data demonstrate monocytes migrate quickly to ACC cells and co-culture with these cells after 48 h. The implications for macrophage / monocyte support of tumour cell growth and metastasis suggests that this immune pathway is a feasible target for future therapeutic intervention using targeted nanotechnology.

P10 Predictive pretherapy blood and bone marrow dosimetry for thyroid cancer patients prepared with rhTSH injection

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Radioactive iodine (I-131) is used as a treatment for thyroid cancer patients who have undergone thyroidectomy. Studies demonstrate that repeated I-131 treatments may alter tumour bio-kinetics and cause radio-resistance of cancer cells. While it has been proposed that maximising the first dose is therapeutically advantageous, the bone marrow radio-sensitivity may limit the prescribed activity. The European Association of Nuclear Medicine (EANM) dosimetry committee have published blood and bone marrow dosimetry procedure for differentiated thyroid cancer (DTC) patients which allows tailoring administered activity by using an I-131 tracer and carrying out whole-body count measurements and sampling subsequently. In St James’s hospital, in-patient preparation for radiiodine therapy involves administering recombinant thyroid stimulating hormone (rhTSH) rather than using thyroid hormone withdrawal technique. This is due to the significantly lower resulting morbidities associated with this method, especially in at-risk groups. There is scant literature implementing dosimetry in this patient group. Accordingly, this study developed an adapted version of EANM dosimetry-based treatment planning to investigate the predictive power of pre-therapy dosimetry in euthyroid patients. Preliminary data collection includes 8 DTC patients referred to Nuclear Medicine department for I-131 treatment. The difference between pre and peri-therapy whole-body and blood residence time was 11.8 ± 4.3% and -4.9 ± 5.57%, respectively, (p = 0.035 and 0.676). The calculated maximum tolerable activity (MTA) difference estimated from pre-therapy and during therapy dosimetry was found not to be significant, -0.7 ± 2.0% (p = 0.997). By proving the robustness of an adapted protocol, the study will prove the feasibility of dosimetry for all patients, irrespective of therapy preparation method.

P11 The clinical pathway of patients referred to the endocrine service for assessment of a suspected thyroid nodule – retrospective chart review over a one-year period

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Thyroid nodules are common, and rarely indicate cancer, but can induce considerable patient anxiety. We reviewed the clinical pathway for patients referred to the Endocrine service with a suspected thyroid nodule(s) in order to understand the common pathologies represented and to identify any sources of diagnostic delay. Retrospective chart review of all patients referred to a single endocrinologist for investigation of thyroid nodule(s) over a 14 month period (01/09/19 to 01/11/20). Thirty-six patients (33 F, 3 M, mean 52 y.o) were included. The majority (83%) were GP referrals. TFIIs were performed in 94%, of whom 55% were abnormal (42% thyrotoxic, 28% SC Hypo, 28% SC Hyper). Ultrasound scans (US) were performed elsewhere prior to referral in 38%; the majority of these had a repeat US at our hospital (average wait 4 weeks). Radiological grading was used in 93%, usually the BTA classification (93%). FNA was performed in 38%, average wait time 10 days. The majority of FNAs (71%) were graded Thy2/2c (14%
Thy1, 7% Thy3, 7% Thy5). Final diagnoses included MNG (40%), Benign nodules (27%), Hashimoto’s thyroiditis (16%), thyroiditis (5%), PTC (5%), Graves’ disease with toxic adenoma (3%). Notably, only 3 patients required onward referral to ENT. Overall, the time to definitive diagnosis from GP referral was 11 weeks. While the overall time to diagnosis was relatively short (11 weeks), there was a large variation (0-61 wks), and cancer patients waited a longer time for diagnosis (21 weeks). There are stages within the diagnostic pathway that are highly efficient (performance of FNA, OPD review after FNA); there are other steps that could be shortened (first attendance, repeat USS).

There was a significant variation (0-61 wks) in the waiting time for definitive diagnosis from GP referral was 11 weeks. While the overall time to diagnosis was relatively short (11 weeks), there was a large variation (0-61 wks), and cancer patients waited a longer time for diagnosis (21 weeks). There are stages within the diagnostic pathway that are highly efficient (performance of FNA, OPD review after FNA); there are other steps that could be shortened (first attendance, repeat USS).

P13 Incidental thyroid nodules on cross-sectional imaging—appropriateness of follow-up

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Incidental thyroid nodules (ITNs) are a common finding on cross-sectional CT imaging of the neck and chest. The majority of ITNs are benign. The British Thyroid Association (BTA) Guidelines recommend further ultrasound (US) evaluation for a select few ITNs with concerning features. We audited the approach to ITNs detected on CT in Connolly Hospital. Using the National Integrated Medical Imaging System, we identified 52 consecutive patients who underwent US for ITNs detected on CT or PET-CT over a period of 18 months. The majority of patients were female (n = 36, 69%) and mean patient age was 65.8 years. When reviewed with reference to the BTA guidelines, US had been performed unnecessarily for two thirds of the patients (n = 34, 65%). Furthermore, 12 patients underwent fine needle aspiration of ITNs following US; none of the nodules biopsied had concerning histological characteristics. All ITNs followed up in our institution had a benign course, with no thyroid malignancy diagnosed over a 30-month median follow-up period. All nodules under US surveillance have been stable during follow-up as well. To date, a significant proportion of patients have been discharged to their primary care physicians (n = 20; 38%). Clinicians reviewing ITNs in our institution—often non-endocrinologists—frequently request follow-up US which may not be necessary. This results in an additional burden for an already overstretched service and unnecessary concern and testing for patients. We propose that radiologists reporting ITNs reference the BTA guidelines to aid non-endocrinologists in their decision-making regarding the need for further investigations. Reference: Perros P, Boelaert K, Colley S et al. Guidelines for the management of thyroid cancer, Clin Endocrinol (Oxf) 2014 Jul; 81 Suppl 1:1–122.

P14 Treatment options and success rates in Grave’s disease

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Grave’s disease is a common cause of hyperthyroidism. Definitive therapy in the form of radioactive iodine (RAI) or surgery is considered for patients who remain thyrotoxic after medical therapy. Patients attending thyroid clinic in Tipperary University Hospital from 2015–2019 were analysed, 1,463 total visits. Those diagnosed with Grave’s disease were included in the study (n = 132), 105 (79.5%) female, median age 40 years (range 14–73). Mean free T4 (fT4) at diagnosis was 45.7, mean TSH-receptor antibody (TRAb) at diagnosis was 11.7. Of 132 patients who were initiated on thionamides, 81 patients (61.3%) either relapsed (n = 47) or required definitive therapy due to poor control or individualised circumstances (n = 34). 66 were female, 15 were male. Of the 47 patients who relapsed, mean time to relapse was 15.7 months (range 2–60 months). There was no correlation between TRAb at diagnosis and time to relapse (r = 0.235, p = 0.124). 17 patients were treated with a second course of thionamides—1 remained hyperthyroid, 3 were lost to follow-up or had pending TFTs, 13 remained euthyroid. Regarding definitive therapy, 40 patients received RAI—2 became hypothyroid, 5 remained hyperthyroid, 9 were euthyroid, 5 were lost to follow-up or had pending TFTs. 22 patients had total thyroidectomy. There was no significant difference between the percentage of females vs males that required definitive therapy (p = 0.87). Treatment options in Grave’s disease are clearly defined. However, treatment choice can vary, with no consensus on optimal management established. Auditing success rates of our therapeutic options allows informed decision-making regarding patient treatment.

P15 Radioiodine treatments for benign and malignant thyroid disease pre and during CoVid pandemic at the NI regional centre for endocrinology and diabetes

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The British Thyroid Association issued guidance near the start of Covid stating that a delay of up to 12 months for radioiodine (RAI) treatment for thyroid cancer would not be detrimental and that, in all but the most extreme cases, patients continue medical management for hyperthyroidism. We reviewed our RAI performance in 2019 and 2020. There was an eight-week pause in treatments from mid-March to May 2020.Upon recommencement, by way of mitigation, patients shielded for two weeks prior to treatment and had a Covid test within 72 h. An outpatient pathway for lower 1100 mBq doses was also started for selected pT1-2N0 (1-4 cm lesion) cancer patients. In 2019, we administered 28 ablative doses of RAI for thyroid cancer vs 41 doses in 2020 (with two in OP). For new patients, median times to treatment were not significantly different pre and post Covid: time from surgery to MDM was 3.2 weeks (IQR 2.1) in 2019 and 3.1 weeks (IQR 1.6) in 2020; time from MDM to RAI was 11.5 weeks in 2019 (IQR 5.2) and 14.3 weeks (IQR 9.7) in 2020. RAI for benign disease was administered to 42 patients in 2019 vs 12 patients in 2020. Of these, most (nine) were administered pre-Mid-March 2020. No Covid infections were detected pre-treatment and no patients required hospitalization with Covid within three weeks of treatment. The decision to take an aggressive approach to restarting RAI treatments for malignant thyroid disease has been successful to date. Benign thyroid treatments have backlogged.

P16 Performance of NI regional thyroid cancer multidisciplinary meeting (MDM) and service during the CoVid pandemic

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The NI Regional Thyroid Cancer MDM was started in June 2017 as a twice-monthly meeting. Core members now include ENT and endocrine surgeons, three endocrinologists with a RAI prescribing licence, an endocrine nurse, radiologist, cytopathologist and oncologist. At CoVid shutdown, the meeting quickly moved to a mostly virtual format in April 2020 and thyroid surgeries moved temporarily to private hospitals. We reviewed the performance of the MDM using the patient cancer database for 2018, 2019 and 2020. There were 22, 23 and 24 meetings held in 2018, 2019, 2020, and over each year 181, 205 and 222 patients were discussed. A qoruur was recorded in 9%, 43% and 63% of meetings across 2018–2020 as a single radiologist and cytopathologist were appointed in 2018 and 2019 respectively. Treatment within 62 days of GP referral was recorded for 42% (2018), 44% (2019) and 70% (2020) of cases (audit target 95%). Treatment within 31 days of clinic attendance was recorded for 90% (2018), 93% (2019) and 80% in 2020 (audit target 98%) with a nadir of 69% in 2nd quarter 2020 (April-June). This meeting has become successfully embedded regionally. During CoVid the MDM continued to run well with no reduction in meetings or patients discussed. Cancer service performance was maintained for 62 but not 31-day treatment targets. An increase in primary care referrals by 20–30% is projected in the near future. This will bring further challenges for the 62-day target. The lack of backup radiology, cytopathology and oncology remain points of weakness.

P17 Analytical drift is a clinical concern: A multi-centre investigation of discordant thyroid function tests

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Assays for thyroid function tests (TFTs) have variable performance. Discordant TFTs challenge interpretation and may result in specialist referral and costly investigation. An increase in the rate of discordant TFTs, concerning high free thyroxine (FT4) with normal thyroid stimulating hormone (TSH), was suspected at Regional Hospital Mullingar (RHM). We undertook a retrospective study of TFTs performed at RHM (Beckman assay) and two comparator Irish laboratories (Site A: Roche assay, Site B: Abbott assay) across four time-points between January-2019 and March-2021. Chi-squared test for trend was used to assess changes over time, and multiple regression linear analysis was used to identify factors associated with discordant TFTs across sites. A total of 67,991 TFTs were included in the final analysis. We report a significant increase in discordant TFTs reported at RHM (Q1 2019 2.8%, Q1 2020 3.9%, Q4 2020 6.9% and Q1 2021 5.5% p < 0.001) and Site A (Q1 2019 2.8%, Q1 2020 2.0%, Q4 2020 2.7% and Q1 2021 3.6% p = 0.02) during the study period, but not at Site B (Q1 2019 0.1%, Q1 2020 0.2%, Q4 2020 0.3% and Q1 2021 0.23% p = 0.23). Use of the Beckman assay was the strongest predictor of discordant TFTs (β7.7, 95%CI 3.2 – 12.3, p = 0.006) after adjusting for age, gender, timepoint and referral source. The Beckman assay generated unexplained, increasingly discordant TFT results over time at RHM, requiring commensurate increase to the upper reference limit. A quality improvement initiative to enable early identification of “analytical drift” through patient data monitoring has been introduced.

P18 Opportunistic thyroid function screening in older medical patients

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Elderly patients with thyroid dysfunction often present with non-specific symptoms making biochemical testing of thyroid function useful and essential. We reviewed the screening rate and prevalence of thyroid dysfunction in geriatric patients admitted to Tipperary University Hospital. A retrospective study was conducted on all hospitalized general medical patients over 70 years old discharged during October 2020. Thyroid function test (TFTs) screened during admission and/or within the prior six months were included in the analysis. 202 patients were included in this study with a median age of 80 years (SD 6.3). 51% (n=102) were male. 85% of the entire cohort (n=171) had TFTs performed. 21% (n=42) had a known thyroid disorder. TFTs were performed in 95% of those (40/42). 33% (13/40) had abnormal TFTs requiring a medication adjustment. Of those with no known thyroid disorder, 82% (131/160) had TFTs performed. 11% (n=14) had abnormal results.8% (n=10) had high TSH levels. One had overt hypothyroidism and the remaining 9 had subclinical hypothyroidism, providing a prevalence of 0.8% and 6.9% respectively. The mean age of the patients with subclinical hypothyroidism was 79.9 years (SD 8.1). 3.1% (4/14) had subclinical hyperthyroidism, providing a prevalence of 3.1% with mean age of 83.5 years (SD 5.7). We observed a high prevalence of abnormal TFTs in those with known thyroid disorders leading to medication adjustment. Screening those without known thyroid disease also yielded abnormal results in 11%. These findings indicate that routine, opportunistic TFTs in medical patients over 70 is beneficial.
P19 A Study to establish treatment response following application of dosimetry in the provision of iodine 131 for treatment of benign thyroid disease

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Dosimetry uses individualised calculated activities of radioactive iodine (RAI) for treatment of hyperthyroidism based on gland size and 24-h RAI uptake (RAIU). This is standard practise at St James’s Hospital since 2016. This study examines activities administered, treatment outcomes and predictors of RAI required to deliver a successful therapeutic dose to thyroid.

Sixty-three (63) patients treated using dosimetry between 2016–2021 were included. 65% (n = 41) had Grave’s disease (GD), 21% MNG (n = 13), 14% (n = 9) toxic nodule. 17% of patients with GD failed treatment, categorised as persistent hyperthyroidism 1 year post RAI. Failure rate in toxic nodule and MNG is eliminated. The median activity administered was 204(range 89–422) mBq for GD, median 353(range 200–441) mBq for MNG, and for toxic nodule202(range 51–437) mBq. 39% (n = 16) of patients with GD and 77% (n = 10) of patients with MNG achieved successful treatment using significantly lower activities calculated by dosimetry compared to fixed dosing (200 mBq and 400 mBq for GD and MNG in our institution). Calculated activity was higher in patients with larger thyroid volumes increasing radiation exposure for this group. There was a trend towards increased RAIU in patients with higher pre-treatment fT4. The application of dosimetry, thereby individualizing RAI for our patients has reduced radiation exposure for most patients without compromising success. It is important to recognise the increased radiation exposure required to successfully treat patients with larger goitres. Further work is required to establish whether clinical variables such as fT4 levels pre-treatment significantly influence RAIU, I131 activity and clinical outcome.

P20 Use of thyroid hormones in hypothyroid and euthyroid patients: A THESIS (Treatment of Hypothyroidism in Europe by Specialists) survey of members of the Irish physicians

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Patients with hypothyroidism require life-long thyroid hormone (TH) replacement therapy. Levothyroxine (LT4) remains the treatment of choice, however, a high proportion of patients remain symptomatic despite normal TSH levels. As part of a Europe-wide survey (THESIS), we sought to review attitudes and clinical practice of Irish endocrinologists relating to the treatment of hypothyroidism. Members of the Irish Endocrine Society (IES) were invited to participate in a web-based survey. 39 of 48 (81.3%) invitees responded. All respondents use LT4 as the preferred treatment option, but 40% would prescribe combination LT4 and T3 therapy in specific circumstances. 12% use desiccated thyroid extract (DTE). LT4 tablet was the preferred formulation among the respondents, and the majority indicated that they expect no significant biochemical changes with other formulations. More than 50% of the Irish endocrinologists stated that they would use thyroid hormone therapy for biochemically euthyroid patients in specific circumstances (e.g. goitre, fatigue, female infertility, hypercholesterolaemia, depression). Over 50% of respondents ascribed psychosocial factors and comorbidities as the cause of persistent symptoms in hypothyroid patients on LT4, rather than inability of LT4 to restore normal physiology (12%) or autoimmunity (16%). LT4 is the treatment of choice for hypothyroidism in Ireland. Even in the presence of conditions affecting bioavailability, Irish endocrinologists prefer LT4 in tablet formulation. Many consider combination therapy for some patients. At odds with guidelines, a significant proportion would offer LT4 to euthyroid infertile women with positive TPOAb, and 12% use DTE. These results have implications for cost of TH replacement in Ireland. Comparison of these results to those of the THESIS surveys from other European countries will be informative.

Audit

P21 Audit of patient knowledge and awareness of “Sick Day Rules” in rheumatology patients on long term glucocorticoid therapy

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Rheumatic disease (RMD) patients treated with long-term glucocorticoids (GC) are at risk of developing adrenal insufficiency. With this survey we aimed to assess the knowledge of RMD patients taking long-term therapy regarding their risk of adrenal insufficiency and understanding of the “steroid sick day rules”. RMD patients taking ≥ 2.5 mg prednisolone daily for ≥ 3 months were recruited from the rheumatology outpatient department in a Dublin Tertiary Care Hospital. Patient knowledge and previous counselling of steroid sick day rules was determined using a 10-point questionnaire carried out face-to-face or via phone call. 51 RMD patients on GC therapy were recruited. The majority of patients were female (n = 41) and aged between 30–50 years (n = 24). The median prednisolone equivalent dose was 5 mg (range 2 mg – 25 mg) and the majority of patients had been taking GC therapy for > 5 years (n = 24). Only 5.9% (n = 3) of patients reported that they had been counselled on the Sick Day Rules. 3.92% (n = 2) carried a steroid emergency card or MedicAlert bracelet. Few patients would increase their steroid dose appropriately in response to infection, vomiting, peri-procedure (e.g. endoscopy, dental procedure), or peripherally (27.5%, n = 14; 17.7%, n = 9; 7.2%, n = 3; 9.8% n = 5, respectively). We demonstrate a significant deficit of patient knowledge around the precautions for long-term GC use in rheumatic diseases. We suspect that our results may be generalisable to many other RMD units. We are currently reviewing our procedures around healthcare professional and patient education, issuing of information leaflets, emergency cards or MedicAlert bracelets etc. to at risk patients.

P22 Audit on caregiver documentation and patient understanding of adrenal sick day rules in a cohort of adrenal insufficiency patients

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Covid-19 pandemic has caused significant concern for adrenally insufficient patients. Early identification of illness and appropriate augmentation of steroid dose could prevent potential crises. Our audit aimed to review education documentation by healthcare professionals and patient understanding of adrenal sick day rules as benchmarked against recognised clinical guidelines. Chart review of documentation was
obtained on 45 patients attending the adrenal clinic. A questionnaire was provided to 19 randomly chosen patients to assess the patient’s adherence and understanding of adrenal sick day rules, usage of medical alert identification, and glucocorticoid emergency kit. The median age of patients was 48 years old (19 to 85), 58% had primary adrenal insufficiency, 42% had secondary; 58% were female. 98% of the charts documented review of adrenal sick day rules, 59%, use of medical alert identification and 77% documented glucocorticoid emergency kit. Based on our survey, 95% of selected patients are confident with sick day rules, 53% are compliant with medical alert identification usage, and 89% reported keeping a glucocorticoid emergency kit. None of the patients reported need to use the emergency kit and 63% had to double dose their steroid dose at least once since the last clinic visit. In conclusion, documentation and patient confidence around adrenal sick rules was excellent. Continued education regarding medical alert identification is needed. It is important to reiterate and assess the patient’s understanding of steroid emergency kit use and adrenal sick day rules at each clinic visit. An education pack is planned for all patients.

P23 Audit of insulin inclusion on discharge prescriptions

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Insulin is a high-risk, time-critical medicine. In MMUH the endocrine team prescribe insulin for all inpatients referred to the insulin management round. The insulin kardex (IK) is thus held separately to the main drug kardex (MDK). This audit aimed to document insulin omission from discharge prescriptions. A retrospective chart and prescription review was undertaken for inpatients requiring insulin in June 2020 (n = 90 screened). The audit tool collected demographic, clinical and prescription details. Of 70 included patients, 85.7% were admitted medically. 24.3% had type 1 diabetes. 98.6% were on multi-dose insulin injections. Insulin omission occurred in 35.7% of discharge prescriptions. No association was observed between a ticked safety alert box (77.1%) and insulin inclusion on discharge prescription (p = 0.865). When insulin was prescribed in the MDK (21.4%), omission rates were 13.3%. A statistically significant association was observed between insulin prescription in the MDK and subsequent inclusion on discharge prescriptions (p = 0.04, odds ratio 1.54, 95% confidence intervals 0.26–3.42). Prescriptions included glucose test strips in 22.8%, needles in 27.1%, lancets in 27.1% and glucagon in 10%. On discharge summary review, insulin was mentioned in 38.6% of summaries. Insulin dose was specified in 25.7%. Endocrinology consults were requested in 42% of patients and diabetes CNS consults requested in 52%. This audit demonstrated errors and discrepancies in insulin prescribing and documentation. Further safety initiatives undertaken included intern teaching, an educational poster and the introduction of an insulin sticker for MDKs. A re-audit is planned to determine the efficacy of these implementations.

P24 Assessment of the uptake rate and factors uptake of pneumococcal and influenza vaccination in patients with diabetes mellitus

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Diabetes mellitus (DM) increases morbidity and mortality from influenza and pneumococcal disease. Influenza and pneumococcal vaccination are associated with decreased hospitalisations and reduced risk of pneumococcal infection in the diabetic population. The National Immunisation Advisory Committee recommends that diabetes patients receive both influenza and pneumococcal vaccination. The aim of this audit was to determine the uptake rate and factors influencing vaccination in a diabetes cohort. A telephone interview assessed the uptake of influenza and pneumococcal vaccination in 100 randomly selected patients attending the DM clinic. The subtype of DM and main factor influencing vaccination status was ascertained. 71% of the study cohort had received the influenza vaccine while 29% reported appropriate pneumococcal vaccination. Regarding influenza vaccination, 84% of Type 2 DM (T2DM) patients were vaccinated in contrast to 42% of those with Type 1 DM (T1DM). Vaccination rates for those < 40-years-old was 20% compared to 76% of patients > 65-years-old. 29% of patients with T2DM were vaccinated against pneumococcal disease, compared to 16% of patients with T1DM. Of patients aged < 40 years, 10% were vaccinated versus 37% of those > 65-years-old. The main factor influencing uptake of both vaccines was lack of awareness of diabetes as an indication for vaccination. This study demonstrated sub-optimal uptake of influenza and pneumococcal vaccination in patients with DM. T1DM and age ≤ 65 years were found to be associated with lower uptake rates. Key target groups have been established for future education initiatives with the aim to improve awareness of need for vaccination.

P25 An audit on the management of diabetic ketoacidosis during the CoVid-19 pandemic in St. Vincent’s University Hospital

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P26 Audit of microalbuminuria screening in diabetes outpatients

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Diabetic microalbuminuria is associated with increased cardiovascular events, progression of chronic kidney disease and mortality. Annual screening is recommended for patients with type 1 diabetes (T1D) of ≥ 5 years duration, and all patients with type 2 diabetes (T2D). We conducted a clinical audit to assess adherence to screening and treatment recommendations, as per the American Diabetes Association Standards of Medical Care in Diabetes 2021. A retrospective chart review of diabetes outpatients attending in January 2021 was performed. Data was analysed in 194 patients, 22.7% with T1D, 75.8% with T2D. The mean (± SD) duration of diabetes was 18 (± 13.6) years, with mean haemoglobin A1c 61.8 (± 15.5) mmol/mol. 54.1% were confirmed to have had screening for microalbuminuria within the recommended timeframe. Of these, 42.9% had abnormal microalbumin:creatinine ratio (MACR). Most patients with abnormal MACR were on angiotensin-converting-enzyme inhibitor or angiotensin-II-receptor blocker therapy, as recommended, with fewer patients on sodium-glucose co-transporter-2 inhibitors. 31.4% of patients were not confirmed to have had screening. The overwhelming majority of these (86.9%) had only attended clinic virtually in the previous year, due to the COVID-19 pandemic. Overall adherence to screening recommendations was excellent in patients who attended clinic in person.
but suboptimal in those who attended virtually, highlighting a potential area of risk. Current practice screens patients with a urine sample on the day of clinic. Based on these results, we recommended screening prior to clinic attendance, at the time of blood testing, with repeat audit next year.

P27 A review of long-term monitoring of patients with acromegaly in the West of Ireland

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Long-term management of patients with acromegaly is improved by monitoring insulin-like growth factor 1 (IGF-1) and pituitary hormone levels, as well as screening for associated co-morbidities. This audit aimed to identify deficits in the monitoring of these patients attending Galway University Hospital (GUH). The Endocrine Society’s guidelines on the frequency of IGF-1 and pituitary hormone testing, echocardiograms and colonoscopies were used as a basis for determining whether monitoring was satisfactory¹. Patient data was analysed to calculate the incidence of these investigations being delayed or absent. Additionally, the incidence of normalised IGF-1 at patients’ most recent testing was determined. 43 patients with acromegaly attending GUH were identified. 35(81.4%) patients were found to have a normal age-related IGF-1 level at their most recent testing. Analysis of patient follow-up found that 14(32.6%) patients had not had their IGF-1 level measured in over a year. Baseline pituitary hormone levels were tested in all patients. 9(20.9%) patients were behind schedule for colonoscopies and 2(4.7%) had never had one performed. 5(11.6%) patients had no record of an echocardiogram being performed. This audit identified deficits in the monitoring of patients with acromegaly however these may have been exacerbated by the COVID-19 pandemic due to the cancellation of non-urgent outpatient services. This could be corrected in the short term by rescheduling patients’ investigations and follow-up however in order to maintain the highest level of care in the future, an electronic database could be implemented to continually monitor and maintain patients’ follow-up. Reference: Katznelson, L., Laws, E., & Melmed, S. (2014). Acromegaly: An Endocrine Society Clinical Practice Guideline. The Journal of Clinical Endocrinology & Metabolism, 993–3951.

P28 Auditing the biochemical evaluation of hypercalcemia in a model 2 hospital

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Hypercalcemia is a common but significant finding in hospital settings. It’s important to investigate whether hypercalcemia is dependent on parathyroid hormone (PTH) secretion as hypercalcemia can occur in up to 30% of patients with malignancy where PTH is depressed. Where PTH levels are not adequately suppressed, investigations for primary hyperparathyroidism need to be considered. Patients with a corrected calcium > 2.65 mmol/L over a 6-month period (January 1st until June 30th 2019) were identified from the biochemistry lab in St. John’s hospital. Data collected included demographic details (age, sex) and biochemical variables (Corrected serum calcium, PTH, vitamin D, magnesium, phosphate, and serum creatinine). After the initial audit an electronic prompt was instituted on the SJH blood system indicating that the calcium was elevated and to consider measuring PTH and vitamin D levels. After the introduction of this prompt, we reaudited the patients admitted with hypercalcemia from January 1st until June 30th, 2020 to assess the proportion of PTH and vitamin D level testing. In the initial audit prior to the prompt 27 patients were identified as having hypercalcemia, 63% (17/27) had a PTH level and 66% (18/27) had vitamin D level checked. In the re-audit with the prompt in place 24 patients were identified as having been hypercalcemic, 79% (19/24) had a PTH level checked and 71% (17/24) had a vitamin D level checked. Biochemical evaluation of hypercalcemia in hospitalised settings tends to be incomplete. The addition of an electronic prompt can have a significant impact on the proportion of testing.

P29 A clinical audit of the fracture liaison service (FLS) at Sligo University Hospital (SUH) in patients following fragility fractures

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Osteoporosis can cause significant morbidity, mortality and healthcare costs due to its complications—namely, fractures of the hip, spine, forearm and other skeletal sites. In 2019, the Royal Osteoporosis Society (ROS) published a summary of clinical standards for fracture liaison services (FLS). These standards state that patients aged 50 years or older with a new fragility fracture should be offered a dual energy x-ray absorptiometry (DXA) scan and have their treatment options examined, within 12 weeks of their fracture. In this audit, we examined the performance of the FLS at SUH in adhering to these guidelines. Patient referral data, treatment details and DXA requests were analysed from a case-notes review of all new patients attending a fracture clinic at SUH from October 2018 to December 2020. This was then compared to the ROS recommendations. A total of 229 fragility fracture patients were analysed, of which only 70% were referred for a DXA scan. Among those referred for a DXA scan, only 75% of those patients actually received a DXA scan. Of those patients who received a DXA scan, only 9% of them received it within the recommended 12 weeks. Those patients who do not receive a DXA post fragility fracture are at high risk of future fractures. Further steps are necessary to bring SUH’s FLS in line with the ROS recommendations, to educate healthcare professionals in primary and secondary care but also to improve referral pathways, including improving service integration between primary care and the falls service.

P30 A study of the proportion of people in an Irish cohort with type 1 diabetes achieving glycemic targets on continuous glucose monitoring

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Continuous glucose monitoring (CGM) provides additional information which complements haemoglobin A1c (A1c) in assessing diabetes control. We assessed achievement of American Diabetes Association CGM targets in our Type 1 Diabetes (T1D) patients. A retrospective analysis of all 155 individuals (81 female) with T1D using Dexcom G6 ® CGM (Dexcom, San Diego, USA), who agreed to share their data remotely, was performed. Proportions achieving recommended targets including CGM-estimated A1c (eA1c), time in range (TIR, 3.9–10.0 mmol/L), time below range (TBR, < 3.9 mmol/L) and time
above range (TAR > 10.0 mmol/L) were calculated; eA1c was com-
pared with lab A1c, where available. Results showed that mean ± SD
duration active time was 93.4 ± 9.7%. Mean eA1c of the group was
7.7 ± 1.6%; 29% achieved eA1c < 7% and 91 had lab A1c within
a ± 4-week period with a mean 7.84 ± 1.3%. A significant correlation
was seen between CGM-estimated and lab A1c (r = 0.65, p < 0.05). The
mean coefficient of variability (target < 36%) was 34.1% ± 6.6%. Over-
using the sensor < 70% of time. The average glucose level for the
17–88 years. Average sensor use was 91.3%, with only 4 patients
(1.9 ± 1.6%) between 3.0–3.8; 0.7% ± 0.6% < 3.0). In total, 22% achieved
between 10–13.9; 16 ± 18.7% > 13.9) while TBR was 2.6% ± 2.2
all mean TIR was 55.1 ± 22.1%. TAR was 42.3% ± 28.5 (26.3 ± 9.8%
was 43.56 ± 12.70 years. 60% of the patients were male.89% (58/65) of
over one month period (1st-29th Feb 2020) were included. The mean age
for treatment is > 70% TIR and < 4% TBR. Median age was 45 [range
and % time below range (TBR). As per consensus guidelines, the goal
analyzed using SPSS. We recorded the percentage time that the sensor
for blood glucose monitoring (DexcomClarity system) and
using the Dexcom G6 ® CGM sensor (Dexcom, San Diego, USA).
The glucose data was compiled using the DexcomClarity system and
alyzed using SPSS. We recorded the percentage time that the sensor
was in use, mean glucose, Standard deviation of glucose, Coefficient
of variation, estimated HbA1c, % time in range (TIR) [3.9-10 mmol/l]
and % time below range (TBR). As per consensus guidelines, the goal
treatment is > 70% TIR and < 4% TBR. Median age was 45 [range
on target TIR and TBR. For our patients using
RT-CGM, 30% achieved the target estimated HbA1c, however fewer
patients achieve target TBR and TAR. Patients with TID using RT-
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Introduction: Real-time continuous glucose monitoring (RT-CGM) is a
rapidly evolving technology that can help patients with type 1 diabetes
(T1D) to improve glucose control.

We aimed to evaluate glucose control in patients with diabetes who
attend Naas Hospital and use RT-CGM. We analyzed the most recent
30 days of glucose data in 112 patients with T1D who are currently
using the Dexcom G6 ® CGM sensor (Dexcom, San Diego, USA).
The glucose data was compiled using the DexcomClarity system and
alyzed using SPSS. We recorded the percentage time that the sensor
was in use, mean glucose, Standard deviation of glucose, Coefficient
of variation, estimated HbA1c, % time in range (TIR) [3.9-10 mmol/l]
and % time below range (TBR). As per consensus guidelines, the goal
treatment is > 70% TIR and < 4% TBR. Median age was 45 [range
17–88] years. Average sensor use was 91.3%, with only 4 patients
using the sensor < 70% of time. The average glucose level for the
total population was 10.0 ± 3.37 mmol/l, with an average estimated
HbA1c of 7.95%. The average TIR was 53.37% and average TBR was
2.14 ± 34 patients (30.4%) had an estimated HbA1c ≤ 7%. 30 patients
(26.8%) had TIR ≥ 70%, 93 patients (83%) had TBR < 4%. Finally, 21
patients (18.8%) had on target TIR and TBR. For our patients using
RT-CGM, 30% achieved the target estimated HbA1c, however fewer
patients achieve target TBR and TAR. Patients with TID using RT-
Cose targets.

Authors have no competing interests to declare.

P32 Screening for diabetic kidney disease in patients with type 1 diabetes mellitus (T1DM)

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Background: We carried out this audit to analyse adherence to the
national guideline for screening for diabetic kidney disease (DDK) in
T1DM patients (2018). Results: 65 patients attending the diabetes clinic
over one month period (1st-29th Feb 2020) were included. The mean age
was 43.56 ± 12.70 years. 60% of the patients were male.89% (58/65) of
patients had been screened for albuminuria either at this visit or during
the preceding year; 12%(07/58) had microalbuminuria and 3% (02/58)
had macroalbuminuria. Average duration of diabetes in those with albu-
minuria was 25 years and the average HbA1C was 64 mmol/l.1patient
with albuminuria had normal blood pressure (BP), 2 had a history of
hypertension, and the remaining 6 had an elevated BP in the clinic
without history of hypertension.2 of these 6 patients had ambulatory
blood pressure monitoring (ABPM) performed which revealed normal
BP. Following confirmation of albuminuria, an angiotensin-converting
enzyme inhibitor/angiotensin-receptor blocker (ACEi/ARB) was pre-
scribed in 55% (05/09). No reason was documented for not prescribing
an ACEi/ARB in the remainder. Creatinine was measured in all patients
(n = 65) while 9% had an eGFR < 60 ml/min/1.7m2. Lastly, a referral to
nephrology was made in all those with indications (n = 1). Conclusion: Screening for DKD in our T1DM patients is satisfactory with a need for improving ACEi/ARB treatment in those with confirmed albuminuria. Co-existing hypertension is an additional risk factor for kidney disease. In patients with elevated clinic BP, an ABPM may be a useful tool to exclude the white coat phenomenon and to tailor therapy.

P33 Hyperglycaemic emergencies: Diabetic ketoacidosis (DKA) and hyperglycaemic hyperosmolar state (HHS) presenting to a tertiary referral hospital—An audit

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We undertook an audit evaluating the glycaemic management of the
emergency presentations DKA and HHS to ED in 2020. Hospital In-
Patient Enquiry (HIPE) data was the principal data source regarding
hospital admissions with DKA and HHS in 2020. HIPE coded data
was reviewed, and 19 DKA admission and 7 HHS presentations were
audited. Each presentation was audited with respect to the hospital
proforma available on hospital systems. 19 DKA presentations were
included in this audit with median age 35 years. The median time to
diagnosis was 17 ± 13.4 min. 100% of the cohort received insulin
and fluids within the first hour, while the fluid/insulin prescription
was incomplete in 32%. 78% met the criteria for severe DKA, 42%
received intensive care review, while 31% received HDU care. On-
protocol hypokalaemia occurred in 42%, and hypoglycaemia occurred
in 26%. Patients remained on protocol/intravenous insulin for median of
15 ± 13 h. 7 HHS admissions were reviewed with median age 85 years.
The time to intravenous fluids was longer than those in DKA. There
was unclear prescription of fluids, insulin in 42%, 57% respectively.
Appropriate electrolyte monitoring in 42% and fluid balance document-
ation was unclear in 71%. Following this audit, we plan to implement
an educational session for hospital doctors on glycaemic emergencies
highlighting key areas identified in this audit: insulin adjustment and
protocol related hypoglycaemia/hypokalaemia. We plan to update our
fluid balance monitoring and review potassium supplementation for
our protocol with review of the recently updated JDBS guidance for
management of glycaemic emergencies.

P34 Clinical audit on patients with primary hyperparathyroidism (PHPT): Strengths and limitations

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PHPT is associated with excess morbidity/mortality. Clinical practice in PHPT varies in terms of investigations, monitoring, interventions and follow-ups. We performed a clinical audit on patients with PHPT who attended Midland Regional Hospital Portlaoise (MRHP) Endocrine clinics for the past 2 years. 2019 NICE guidance on PHPT management was reviewed to determine how patients were diagnosed, treated and followed-up post-operatively. Twelve patients with biochemically confirmed PHPT were studied. Their mean age was 54.9±6.9 years; 58% were female. 100% of patients had serum calcium, bone and renal profiles, PTH, vitamin D and 24-h urinary calcium level measurements. Only 42% managed to have DXA scans as DXA service is not available at MRHP. All patients who had DXA scan showed osteoporosis or severe osteopenia. US/CT renal tract was requested for all patients. Mean corrected calcium levels of patients were 2.8±0.2 mmol/L; eGFR 90±13 ml/min/1.73m²; PTH 167.9±69.8 pg/ml (reference range 15–68.3 pg/ml); 24-h urinary calcium level 8.2±4.2 mmol/24 h. 31% were vitamin D deficient. Eleven patients were referred for parathyroid surgery; one was not fit for surgery due to co-morbidities. All patients referred for surgery had SPECT-CT for localization of parathyroid pathology. Six patients so far had parathyroid surgeries and parathyroid adenoma was identified in all six patients. All patients, who underwent parathyroid surgery, had follow-ups at 6 weeks post-operative with normalization of serum calcium levels.

Our pre-fatory study confirmed that we have a good adherence to NICE guidance on PHPT management. There is a limitation to assess bone mineral density due to unavailability of DXA service locally.

P35 Monitoring and management of blood glucose levels for inpatients on steroids: Are the standards being met?

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Glucocorticoid-induced hyperglycaemia in inpatients is associated with worsened healthcare outcomes. The Joint British Diabetes Societies guidelines recommend monitoring of blood glucose 4 times daily for inpatients with diabetes and at least once daily for those without pre-existing diabetes. We performed a snapshot one-day study of adult inpatients in Midland Regional Hospital Portlaoise in August 2021 to investigate what percentage of inpatients were on systemic glucocorticoids and to determine how their glycaemic control was being monitored and managed. We identified 16 of 76 (21%) inpatients were on systemic glucocorticoid treatment on the day, including four patients with COVID-19. Of those on steroids, 44% had history of type 2 diabetes; 56% had no known pre-existing diabetes. Six patients were on dexamethasone; six on prednisolone; four on hydrocortisone. Of the patients on steroids with diabetes, 100% had blood glucose monitoring at least once daily; 87% had 3 times daily; 57% had 4 times daily; 71% of these patients had hyperglycaemia recorded during admissions (> 10 mmol/L); 57% required supplementary insulin treatment. Of the patients on steroids without diabetes, only 11% had their blood glucose monitored daily, with no hyperglycaemia or hypoglycaemia found. Our study identified that one in five of our inpatients were on systemic glucocorticoids on an average day. Blood glucose monitoring was not adequately performed on inpatients on steroids without pre-existing diabetes. Therefore, interventions which would be indicated to combat hyperglycaemia were not performed. Ongoing education/training is required to promote staff awareness of glucocorticoid-induced hyperglycaemia in inpatients with or without history of diabetes.

P36 Inpatient diabetes care audit: Impact of COVID-19 pandemic on inpatient diabetes service

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COVID-19 pandemic has posed numerous challenges for healthcare services. It has forced a drastic redesign and re-distribution of resources to cope with the ever-evolving situation. Effective inpatient diabetes care has beneficial impact on early patient recovery and discharges. We performed a snapshot study of the patients admitted to Midland Regional Hospital Portlaoise on 4th March 2021, to determine ongoing care needs of inpatients with diabetes and to assess changes in service requirements compared to the previous 2018 audit. We found 16 out of 79 inpatients (20%) had diabetes. This was similar to the percentage identified in the previous audit (20%). Hyperglycaemia (capillary blood glucose > 10 mmol/L) was recorded in 50% while the previous audit identified 45% with hyperglycaemia. Hypoglycaemia (capillary blood glucose <4 mmol/L) was found in 6.3%, which was 10% in the previous audit. 63% of in-patients with diabetes were reviewed by diabetes team while 60% were reviewed in the previous audit. Diabetes medication errors were found in a smaller number of patients, 6.3% as compared to previous 15%. There were no cases of hospital-acquired diabetic ketoacidosis or hyperglycaemic hyperosmolar state noted in both audits. Our study identified that on an average day, 20% of our acute hospital beds are still occupied by patients with diabetes. Approximately 60% of these warrant the input from the diabetes service. Thus, we conclude that the burden on inpatient diabetes services at our hospital remains high during COVID-19 pandemic. Despite multiple challenges during the pandemic, the effective provision of inpatient diabetes service is being maintained.

P37 A District general hospital diabetes team experience of the COVID-19 pandemic, one year on

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Diabetes has an increased mortality risk in those with COVID-19 infection. High HbA1c and increasing age have been associated with increased risk. We assessed our experience in a district general hospital with subgroup analysis in those with diabetes, including 12 months follow-up. From March to October 2020, all patients admitted with laboratory or clinically confirmed covid-19 were included in the review. For completed data in the diabetes cohort, this was extended to December 2020 (n = 100). A total of 398 patients were admitted with covid-19 infection, with 29% (n = 114) having diabetes. Nearly a third (n = 31) of covid-19 related deaths were in those with diabetes. In the diabetes cohort, Covid-19 infection was the primary reason for admission in 70%. This population was older, with 82% over the age of 60, and had a higher BMI with 67% > 25 kg/m². Prior to admission, 28% were insulin treated; whilst 7% were on SGLT2 inhibitors. Over 50% required a length of stay over 7 days, whilst in those that died, 38% of deaths occurred in the first week. In the following 12 months an additional 6 patients have died. One patient has also been commenced on insulin. Diabetes is associated with increased mortality in COVID-19 patients. Our study demonstrates this increased risk, highlighting the older
person is particularly at risk and that early diabetes team intervention may be required to help reduce length of stay and the increased mortality risk.

**Case reports**

**P38 Swollen body is not often an endocrine disorder: A case report of hereditary lipoedema**

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Hereditary Lipoedema is a fat disorder often misdiagnosed or unrecognised. Here we describe a 39-year-old woman referred by her GP to exclude Cushing syndrome after she developed weight gain and swollen limbs. A 39-year-old female fitness instructor was referred by her GP concerned of increased fat around abdomen, arms, and thighs over a 3-year period. She had subsequently failed an overnight dexamethasone suppression test (ODST) when performed by her GP. On further reviewing her history, the patient reported no history suggestive of Cushing, thyroid, or acromegaly disorder. She also reported that her mother and 3 sisters had similar thighs and legs appearance. On examination, there were no obvious signs of Cushing, thyroid disease, or acromegaly. Visual fields were normal. There was an obvious fat pad below both knees, whilst thighs and arms were noted to be bilaterally enlarged and out of proportion to the rest of her body. Both feet were spared bilaterally from the fat distribution. She had full pituitary screen, 24 h collection of urinary cortisol and repeat ODST all of which came back negative. Hence, based on the patient’s history and family history, physical findings, and negative hormonal results, a diagnosis of lipoedema was established. Lipoedema is an under-recognized and often misdiagnosed condition; despite an estimated prevalence of 10% in the overall female population. Lack of familiarity and knowledge of this condition can make the diagnosis very challenging with females frustrated trying to find an explanation of the physical changes they experience.

**P39 A Partial glucokinase (GCK) gene deletion in a family with stable mild hyperglycaemia**

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GCK-MODY (Maturity Onset Diabetes of the Young) is an autosomal dominant disorder caused by mutations in the GCK gene leading to stable, mild hyperglycaemia. Whole or partial gene deletions account for 3% of GCK mutations and have been associated with a more variable phenotype with some reporting more severe hyperglycaemia. We report a pedigree with GCK gene deletion and stable mild hyperglycaemia in keeping with the typical GCK-MODY phenotype. A 40-year-old lady was diagnosed with gestational diabetes and subsequently impaired fasting glucose and impaired glucose tolerance on her postnatal OGTT. She was started on metformin after a failed trial of diabetic diet 6 months after diagnosis. Family history involved 3 linear generations including her sister, mother, maternal uncles, grandmother, and granduncles who were all diagnosed with diabetes. On examination, her BMI was 22. OGTT showed a fasting Glucose of 6.1 mmol/L and 2 h post OGTT glucose was 9.2 mmol/L. Her hba1c was 48 mmol/mol with negative GAD and islet cell antibodies. Direct GCK gene sequencing did not reveal any mutation, but next generation sequencing (NGS) identified a partial deletion of the promoter and Exon 1 of the GCK gene, (c.(?,-441)_(G5+13,461-del)). Glycaemic control remained stable with fasting glucose between 6.5 to 7.5 mmol/mol and hba1c persistently between 44 to 47 mmol/mol. Genetic testing confirmed the same gene deletion with her sister. Her glucose control remains stable with hba1c between 48 to 51 mmol/mol. This case highlights the importance of NGS usage to increase detection rates of MODY and the variable expressivity seen with GCK gene deletions.

**P40 Insulin-like growth factor-2 mediated hypoglycemia: An under-recognised phenomenon**

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Non-islet cell tumour hypoglycaemia (NICTH) is rarely encountered in clinical practice. Insulin-like growth factor 2 (IGF2), the most common cause of NICTH, is a paraneoplastic syndrome observed in the setting of mesenchymal and epithelial neoplasia characterised by IGF2 activation of the insulin receptor.

An 80-year-old female presented with a history of recurrent episodes of confusion associated with laboratory confirmed hypoglycaemia with a fasting plasma glucose of 2.7 mmol/L which fulfilled Whipple’s triad. Diagnostic clues to the aetiology at time of presentation include the fasting pattern of hypoglycaemia, hypokalaemia and the absence of weight gain. Our patient proceeded to a 72 h fast with results showing early hypoglycaemia and suppression of serum insulin, c-peptide, proinsulin and negative insulin antibody. A subsequent elevated serum IGF2:IGF1 ratio of 22.3 was consistent with IGF-2 mediated hypoglycaemia and imaging studies demonstrated a pelvic mass. Dietary intervention and oral prednisolone abated hypoglycaemia prior to surgery. Ultimately, hypoglycaemia resolved following operative intervention and steroid therapy was successfully withdrawn. Histopathology was remarkable for dual neoplastic processes with uterine wall fibroma confirmed as the source of IGF2 hypersecretion on immunostain and a coincidental invasive high grade serous carcinoma. The paradox in this case is that the apparently benign solitary fibrous tumour accounted for the patient’s morbidity, through secretion of IGF2 and without treatment, posed a significant mortality risk despite the synchronous presence of a highly malignant fallopian tube neoplasm. This case reinforces the need for thorough clinical evaluation of hypoglycaemia to allow prompt and definitive management.

**P41 A case of diabetes in adulthood associated with ABC88 mutation on a background of congenital hyperinsulinism**

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Mutations in the ATP binding cassette subfamily C member 8 (ABCC8) gene which codes for the sulphphonylurea receptor 1, have been found to be associated with congenital hyperinsulinism (CHI) as well as rare forms of diabetes. Our case is of an 18-year-old female referred to the adult endocrine clinic with hyperglycaemia associated with a three week history of 2.7 kg weight loss, polyuria and polydipsia in
the absence of ketosis. Plasma venous glucose was 18.3 mmol/L with HBA1c of 97 mmol/mol. GAD and islet cell antibodies were negative. On examination, weight was 44.3 kg, height was 1.62 m, and BMI was 16.9 kg/m². She was commenced on multiple daily insulin injections. Of significance, the patient had history of 95% pancreaticectomy in infancy due to CHI unresponsive to medical treatment with diazoxide and octreotide. Due to her atypical presentation genetic testing was performed which revealed a paternally inherited heterozygous ABCCC8 c.1879del mutation. As certain ABCCC8 mutations are sensitive to sulphonylurea therapy the patient was trialled on Gliclazide MR however this was unsuccessful. She currently remains stable on total daily insulin of 16 units of insulin daily with a HBA1c of 49 mmol/mol. While diabetes in our patient was likely due to the gradual decline in Beta-cell mass, ABCCC8 mutations may predispose to diabetes in adulthood, independent of pancreatectomy. Long term management of these patients in the adult setting as well as the future outcomes needs to be established including implications for possible pregnancy management for mutation carriers.

P42 The coexistence of autoimmune diabetes and maturity onset diabetes of the young (MODY): A case series

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The coexistence of autoimmune diabetes and MODY is exceedingly rare. The absence of pancreatic autoantibodies is a key factor prompting MODY genetic testing (1). We report three cases of young onset diabetes with progressive beta cell dysfunction, positive glutamic acid decarboxylase (GAD) antibodies and genetic confirmation of HNF1A-, HNF4A-, and ABC8-MODY. The first case is a woman diagnosed with HNF1A-MODY diabetes > 30yrs after her initial diagnosis of adult-onset diabetes at 25 y/o. She required insulin after her fourth pregnancy. She became ketotic on a trial of oral hypoglycaemic agents (OHAs) and subsequently her GAD antibodies tested positive. The second case is a woman diagnosed with diabetes at 17 y/o who was diagnosed with HNF4A-MODY after many hypoglycaemic episodes on low-dose insulin. GAD antibodies were strongly positive. The last case is a man diagnosed with diabetes at 26 y/o who was well controlled on OHAs and required insulin many years later due to sudden deterioration in glycaemic control. His ABC8-MODY was diagnosed upon realisation of a strong family history and GAD antibodies tested positive. All subjects are treated with insulin. Less than 1% of subjects with MODY have positive autoantibodies. These cases highlight that individuals may have two different types of diabetes simultaneously or consecutively. Deterioration of glycaemic control in subjects with MODY diabetes should highlight the need to look for the emergence of autoantibodies. At each clinic visit one should update the family history as MODY was initially suspected of HNF1β-MODY due to the presence of renal cysts and diabetes. Another sister identified with the same mutation, has diabetes, pancreatic agenesis but no renal cysts. This case highlights the difficulty in diagnosing HNF1β-MODY due to the wide phenotypic variability, lack of imaging used in routine clinical practise, lack of endogenous insulin production and poor response to sulphonylurea unlike other forms of MODY.

P44 Successful transition from insulin to sulfonylurea treatment in an adult with permanent neonatal diabetes mellitus with a KCNJ11 mutation: A case report

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A 41-year-old male was referred to the endocrinology department in Galway University Hospital (GUH) for consideration of sulfonylurea treatment for management of permanent neonatal diabetes mellitus. He was diagnosed with diabetes mellitus (DM) at 10 months of age and treated with multiple daily injection (MDI) therapy for presumed Type 1 DM. He was found to have a mutation of the KCNJ11 gene (Chr11:g.17408639 pathogenic variant) 2 years ago after his son was diagnosed with neonatal-onset DM at 10 weeks of age due to the same mutation. HbA1C at time of review was 61 mmol/mol. He underwent an oral glucose tolerance test to assess C-peptide levels prior to trial of sulfonylurea treatment. He was commenced on gliclazide 30 mg once daily and continued to take long-acting insulin Lantus. His short-acting insulin was stopped. Due to the risk of hypoglycaemia during the transition, funding was approved for a FreeStyleLibre (Abbott Diabetes Care Inc, USA) continuous glucose monitor (CGM) which allowed monitoring of his blood glucose level remotely and adjustment of both his gliclazide and Lantus doses gradually. He is now on gliclazide 90 mg once daily with no insulin requirement. 80–90% of patients with neonatal DM caused by mutations in the KCNJ11 gene are responsive to sulfonylurea treatment however earlier transition from insulin to a sulfonylurea is associated with improved outcomes therefore the majority of reported successful cases have been in children. This case was the greatest time from diagnosis identified in the literature that achieved successful transition from insulin to sulfonylurea treatment alone. Authors have no conflicts of interests to declare.
Diabetes mellitus (DM) is a heterogeneous disorder with variable presentation. Individuals may have two different types of diabetes simultaneously or consecutively. Type 3c pancreaticogenic DM can be under-recognised in clinical practice, impacting treatment and prognosis. We report a case of new-onset DM considered to be Type 3c pancreaticogenic DM until Glutamic acid decarboxylase antibodies (GAD) subsequently measured strongly positive. A 58-year-old man presented to the Mater Hospital with a 3-week history of fatigue, polyuria, polydipsia and weight loss of 5 kg (BMI 26). On admission, his blood glucose levels were 16.4 mM and his ketones were 0.3 units. His HbA1c was 90 mmol/mol. Amylase was 28 IU/L. His medical history included hypertension, hypercholesterolaemia, alcohol excess (30 units weekly) and severe necrotising gallstone pancreatitis in 2019. Post-recovery of his pancreatitis an EUS showed cholelithiasis with biliary sludge. He underwent a laparoscopic cholecystectomy. He had a family history of T2DM. A clinical diagnosis of diabetes was made, and he was discharged on Metformin, Diamicron and Humulin M3. Several weeks later, his GAD returned as >2000 units and anti-islet antibody >40 units, confirming a diagnosis of type 1 diabetes. He was changed to multiple daily insulin injections. This case illustrates the potential for misdiagnosis or delayed diagnosis if the aetiology of the diabetes is not considered carefully. Initially, T2DM or T3cDM were thought more likely in this patient, until the investigation results indicated that this was autoimmune diabetes. The importance of a comprehensive work-up and continued care was crucial in his management.

The life-threatening triad of diabetic ketoacidosis (DKA), hypertriglycerideremia (HTG), and pancreatitis is rare. Mild to moderate HTG can be associated with poorly controlled diabetes due to lack of insulin resulting in lipolysis and increased free fatty acids. We describe a first-time presentation of diabetes with severe hypertriglycerideremia-induced acute pancreatitis and DKA. A 17-year-old female with no background history presented acutely to the Emergency Department with nausea, vomiting and abdominal pain. On examination, she had a normal BMI, severe abdominal tenderness and was vitally stable. Initial investigations revealed marked serum lipaemia, neutrophilia and raised urinary amylase. After resuscitation with intravenous fluids blood glucose was recorded at 24 mmol/L with elevated ketones (4.1) and raised anion gap acidosis (pH7.13). Urgent imaging confirmed acute interstitial pancreatitis. She was managed as per diabetic ketoacidosis protocol and transferred to the intensive care unit for persistent ketosis and acidosis. Her initial TG were 180 mmol/l and HbA1c was 110 mmol/l. Plasma-pheresis was considered; however, her TG improved with insulin alone to 6.1 mmol/l within 48 h. The patient was discharged on basal-bolus insulin and oral fenofibrate. A full genetic panel for HTG levels.

Gastroparesis is a form of autonomic neuropathy and potentially debilitating complication seen in people with type 1 diabetes (T1D). We present a case of a 52-year-old patient with severe gastroparesis secondary to long-standing, poorly controlled T1D. Radionucleotide labelled gastric emptying study confirmed severely delayed emptying with gastric retention of tracer at 1 h of 97%, 2 h of 86%, 3 h of 78% and 4 h of 57%. Despite DAFNE training and treatment with a Medtronic Minimed™640G insulin pump (Medtronic USA) with smartguard™, high degrees of glucose variability persisted, with marked hyper and hypoglycaemic excursions. HbA1c remained sub-optimal, ranging from 68-80 mmol/mol. Very little benefit from prokinetic therapy was observed for symptom relief. With advancements in insulin pump technology, we used a Medtronic Minimed™780G insulin pump (Medtronic USA) in advanced hybrid closed loop mode, in an attempt to reduce glucose variability, increase time in range(4-10 mmol/l) and lower HbA1c. After 2 months of treatment, HbA1c reduced to 50 mmol/mol, with 70% of glucose readings in range.
Importantly, the patient also reported a significant improvement in gastroparesis-related symptoms. This case illustrates that the Medtronic MiniMed™780G advanced hybrid closed loop system may be useful in managing patients with type 1 diabetes with troublesome gastroparesis and sub-optimal glycaemic control. Authors have no conflicts of interest to declare.

**P49 The use of continuous glucose monitoring (CGM) in a patient with longstanding type 1 diabetes (T1D) on multiple daily insulin injections and recurrent severe hypoglycaemia**

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Hypoglycaemia in T1D is associated with increased morbidity and mortality. In longstanding T1D, defective glucose counter regulation and attenuated sympathoadrenal response with loss of norepinephrine and acetylcholine secretion leads to loss of hypoglycaemia awareness and increased risk of severe hypoglycaemia. CGM involves continuous wearing of a device which measures interstitial glucose every five minutes, providing real-time glucose data. The use of CGM in patients on multiple daily insulin injections (MDI) improves glycaemic control with haemoglobin A1c (HbA1c) reductions and reduced incidence of hypoglycaemia. Our case is a 45-year-old male, with T1D of 22 years’ duration, on pre-meal Aspart and basal Degludec. Medical comorbidities include background retinopathy, maculopathy, primary hypoptyroidism, and methadone abuse. Glycaemic control had been poor since diagnosis, with inconsistent adherence to insulin regimes, episodes of diabetic ketoacidosis, and impaired hypoglycaemia awareness with frequent hospital admissions with severe hypoglycaemia. HbA1c ranged from 64-108 mmol/mol; just prior to starting CGM, HbA1c ranged 54-58 mmol/mol. Adrenal insufficiency and Coeliac disease were outruled. Commencement of CGM in 2020 led to a rapid and remarkable improvement in glycaemic control. Since starting CGM, he has had no further severe hypoglycaemic episodes, no diabetes-related hospital presentations and has regained some hypoglycaemia awareness. HbA1c has improved to 50 mmol/mol, with sensor data showing glucose time in range of up to 94%. Quality of life has improved significantly. National guidelines recommend consideration of CGM in select patients with T1D, including those with severe hypoglycaemic episodes and frequent asymptomatic hypoglycaemia. This case illustrates multiple potential benefits associated with its usage.

**P50 Case report: Hb phenom penh causing disproportionally elevated HbA1c readings**

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HbA1c has a central role in the diagnosis and follow up of all patients with diabetes. Accurate measurement is essential but multiple patient conditions can cause an unreliable HbA1c reading. A 38-year-old lady presented to the endocrine clinic with thyrotoxicosis. In the preceding months, she had had recurrent miscarriages and was diagnosed with diabetes based on a HbA1c of 49 mmol/mol (20–42 mmol/mol). She was of Chinese/Irish ethnicity and had strong family history of type two diabetes. She successfully achieved pregnancy and attended the antenatal diabetes clinic. Throughout her pregnancy her fasting and post prandial glucose levels were all within target, <5 mmol/L and <7 mmol/L respectively, and she never required insulin therapy. Both her sisters and father were found to have HbA1c levels disproportionately elevated compared with capillary glucose readings. Fructosamine, a measure of glycated proteins, was significantly lower than HbA1c values in all family members. Genetic testing revealed that all family members were heterozygous for the alpha 1 globin gene mutation codons 117/118 which gives rise to the haemoglobin variant Hb Phenom Penh. This is known to have no clinical significance other that a spuriously elevated HbA1c and has been identified in patients of Chinese, Taiwanese and Thai descent. It is imperative to look at the HbA1c as one part of the assessment of the diabetic patient but it is equally important to recognise clinical scenarios and factors that may yield a false result.

**P51 Case report: Malignant melanoma presenting as plantar ulceration in a patient with type 2 diabetes**

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A 70-year-old man was admitted from the diabetic podiatry service with a non-healing ulceration on the plantar surface of his right foot. The ulcer was painless with an uncertain duration. There was no history of trauma or previous ulceration. The man had a history of diet-controlled type two diabetes mellitus (HbA1c 42 mmol/mol), ischaemic heart disease and hypertension. Examination revealed a 3 × 4 cm fleshly erythematous soft tissue mass without significant overlying granulation tissue. Peripheral pulses were palpable. There was no evidence of peripheral neuropathy. Plain x-ray of the foot showed no evidence of osteomyelitis; a swab grew mixed anaerobes and inflammatory markers were within normal limits. The man was treated with empiric antibiotics and a biopsy was obtained. Grossly microbiology revealed an irregularly shaped fragment of tan and dark brown tissue and microscopy revealed malignant cells with pigment deposition, highly suggestive of malignant melanoma. On immunohistochemistry the tumour cells stained positive for melan A and SOX 10, confirming a melanoma. Following discussion at the melanoma MDT and he went on to have a wide local excision of the lesion with split skin grafting. Further whole-body imaging revealed a lung lesion concerning for metastasis and he is currently undergoing treatment with the programmed cell death-1 inhibitor, pembrolizumab. This case highlights that acral melanoma can be misdiagnosed as diabetic foot ulcers as they can be amelanotic and can frequently ulcerate. Early biopsy of atypical foot ulcers in patients with diabetes should be considered.

**P52 Artefactual hypoglycaemia in a patient with limited cutaneous systemic sclerosis**

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Limited Cutaneous Systemic Sclerosis (lcSSc, formerly “CREST syndrome”) is characterised by Raynaud’s phenomenon and skin fibrosis affecting the hands, feet, face and forearms. Patients with Raynaud’s phenomenon may experience decreased finger capillary blood flow, slower glucose transit time through tissues, and increased glucose extraction by the tissues. Consequently, patients with lcSSc may exhibit artefactual hypoglycaemia (or “pseudo-hypoglycaemia”), whereby finger-prick blood glucose measurements are low, in the presence of normal plasma glucose concentrations [1]. We present the case of a 76-year-old, non-diabetic woman, brought to hospital following a witnessed episode of weakness while out walking. Her past medical
Diabetic ketoacidosis (DKA) is a potentially life-threatening acute complication of diabetes arising from a relative insulin deficiency, which occurs in type 1 diabetes and in the setting of moderate to severe illness. We describe a case of 40-year-old gentleman without known comorbidities. He presented to Emergency Department with a three-day history of fever, breathlessness, generalised weakness and two-day illness. We describe a case of 40-year-old gentleman without known comorbidities. He presented to Emergency Department with a three-day history of fever, breathlessness, generalised weakness and two-day illness.

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Diabetic ketoacidosis (DKA) is a potentially life-threatening acute complication of diabetes arising from a relative insulin deficiency, which occurs in type 1 diabetes and in the setting of moderate to severe illness. We describe a case of 40-year-old gentleman without known comorbidities. He presented to Emergency Department with a three-day history of fever, breathlessness, generalised weakness and two-day illness of polydipsia and polyuria. Investigations revealed severe DKA (random venous glucose of 26.7 mmol/L, blood ketones 4.2 mmol/L, pH 7.11, bicarbonate 8.4 mmol/L, anion gap 28.5 mmol/L, HbA1c 94 mmol/mol). He tested positive for SARS-CoV-2 infection on PCR assay. CT scan revealed extensive confluent, ground glass opacifications in both lung fields, consistent with COVID-19 pneumonia. He was managed as per local DKA protocol with IV fluids and IV insulin infusion along with oxygen via nasal prongs, IV dexamethasone and remdesivir for COVID-19 in infection and closely monitored in high dependency setting. He responded well to treatment and DKA resolved on the second day of admission. He was discharged home 7 days later on insulin basal bolus regime. Autoimmune antibodies for type 1 diabetes (anti-GAD, anti-islet cell, anti-insulin, ZnT8, IA2 antibodies) were negative. The relationship between diabetes and COVID-19 is believed to be bi-directional. While hyperglycaemia increases mortality/morbidity related to COVID-19, the virus itself can induce/worsen hyperglycaemia, culminating in a vicious cycle. Our case highlights the importance of cautious interpretation of low finger-prick blood glucose measurements in patients with compromised peripheral vascular circulation.

Reference: [1] Tarasova VD, Zena M, Rendell M. Artificial hypoglycaemia: an old term for a new classification. Diabetes Care. 2014 May 1;37(5):e85-6.

P54 Familial hypocalcuric hypercalcaemia type 1 caused by novel heterozygous missense variant in CaSR gene, p(His41Arg)

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Familial hypocalcuric hypercalcaemia type 1 (FHHT1) is a benign cause of hypercalcaemia resulting from inactivating mutations in the CaSR gene and characterised by autosomal dominant inheritance with several hundred mutations described. We report the case of a 17-year-old female with no significant past medical history, admitted with acute appendicitis requiring laparoscopic appendectomy. Routine investigations were significant for hypercalcaemia, corrected calcium 3.19 mmol/L (2.21–2.52 mmol/L), elevated parathyroid hormone of 84 pg/ml (15-65 pg/ml), and Vitamin D by mass spec < 10.0 mmol/L (> 50 mmol/L). 24-h urine calcium was low, 0.75 mmol/24 (2.50–7.50 mmol/24). US neck did not demonstrate any parathyroid or thyroid pathology. MRI pituitary with contrast was unremarkable. She was initially managed with intravenous fluids and Zolendronic acid 5 mg with temporary normalisation of calcium though ultimately required commencement of Cinacalcet 30 mg daily for persistent hypercalcaemia. Gene analysis was subsequently significant for a novel heterozygous missense variant of the in the CaSR gene, p(His41Arg). Protein modelling suggests that this variant protein forms several extra hydrogen bonds in the inactive conformation impairing transition to the active conformation, resulting in a loss of function. This supports that this is likely a pathogenic variant causing FHHT1. The patient has a maternal first cousin once removed who has also been identified as positive for this mutation, and two further family members are awaiting investigation for hypercalcaemia. The identification of this novel CaSR gene mutation established the cause of hypercalcaemia and the patient and her family have been referred for genetic counselling.

P55 Hyperandrogenism in late adolescent vs post-menopausal women- a review of 2 cases

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Hyperandrogenism/androgen excess is a common disorder of women of reproductive age with a prevalence of 5–10%. Overt hyperandrogenism after menopause is a rare entity. Causes can be divided into tumourous- consisting of adrenal or ovarian tumours or non-tumorous causes such as ovarian hyperthecosis, congenital adrenal hyperplasia, PCOS, obesity, insulin resistance, endocrinopathies and iatrogenic causes. An androgen producing tumour should be excluded in every woman with severe hirsutism or frank virilization and markedly elevated testosterone levels. Approximately 1% of ovarian tumours that comprise testicular cell types can cause hyperandrogenism with characteristic virilisation. We present two cases of androgen secreting ovarian tumours in women of contrasting ages. Case 1 is of a 17-year-old female referred to our endocrinology service with hirsutism. Physical examination revealed significant virilisation with hirsutism, acne, temporal recession and deepening of the voice. Laboratory investigations revealed a markedly elevated testosterone level of 13.57 nmol/l and imaging revealed a large ovarian mass. This was excised and histology was consistent with a sertoli-leydig cell tumour. Case 2 is of a 71-year-old lady referred with hirsutism. Laboratory investigations again revealed a markedly elevated testosterone level of 18.08 nmol/l and imaging revealed a cystic mass in the pelvis. She underwent a total abdominal hysterectomy and bilateral salpingo-oophorectomy and omentectomy. Histology revealed a benign serous cystadenoma, lined with lutinising cells likely to account for the hyperandrogenism. In both cases the clinical and biochemical hyperandrogenism resolved completely post operatively.

P56 Megestrol acetate induced Adrenal suppression

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Megestrol acetate, a synthetic progestin is utilised as an anti-anorexigenic medication. It has a high affinity for the glucocorticoid receptor, and suppression of the HPA has been reported rarely in the literature. We present the case of a 74-year-old female, referred to the Acute Assessment Unit in a University Hospital with a 3-month history of shortness of breath. Her medical history included an elective hip replacement (6 weeks previously), hypertension, COPD, left breast cancer (20 years previously-in remission). Her medications included megestrol acetate 160 mg OD which had been started 3 years previously for appetite stimulation. On examination, she had clinical evidence of fluid overload with bibasal crepitations and lower limb oedema. Serum sodium was low at 117 mmol/l. A Short Synacthen test was abnormal, with a pre ACTH cortisol level of 201 nmol/l, and post ACTH cortisol level of 275 nmol/l. Her ACTH<0.7 pmol/l. Our impression was that she had pituitary related adrenal insufficiency, possibly due to Megestrol acetate. The medication was discontinued, and she was commenced on hydrocortisone 10 mg mane, 5 mg tarde. Six weeks later a Short Synacthen test was repeated, with her morning dose of steroid held. She had a satisfactory increase in her cortisol to 516 nmol/l after 60 min. Her sodium had normalised at 138 mmol/l. Our diagnosis was suppression of the pituitary-adrenal axis secondary to long term Megestrol acetate, and a secondary hyponatraemia. We weaned her steroids and she remains well. The adverse effect of Megestrol acetate on the HP axis is a poorly recognized entity in clinical practice.

**P57 Metastatic breast cancer in a male patient – Why me?**

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A 69-year-old man presented to the Emergency Department with abdominal distension, dyspnoea and 13 kg weight gain. Past history was significant for metastatic bilateral breast cancer previously treated with mastectomy and chemotherapy, recurrent unprovoked venous thromboembolism and hypothyroidism. He was married for 40 years and had no children, with apparently unexplained infertility. Physical examination revealed tall stature, tense ascites and hepatomegaly. CT scan confirmed widely disseminated metastatic disease. A diagnosis of Klinefelter’s syndrome (KS) was suspected, but considered incidental to his clinical care at the time of presentation. On further discussion with the patient, however, he expressed a wish to gain insight into potential causes for his breast cancer. Further investigations confirmed primary hypogonadism secondary to KS (47,XXY). Considering the burden of metastatic disease, the patient’s management was centred on comfort care. He passed away 10 days following admission. KS is the most common sex chromosome disorder in males, is frequently undiagnosed, but early diagnosis can improve quality of life for patients and reduce morbidity. KS increases risk of breast cancer. An earlier diagnosis of KS and subsequent education of the patient regarding non-reproductive manifestations of the condition may have led him to seek medical attention earlier for his breast complaints.

**P58 Central serous chorioretinopathy secondary to intramuscular testosterone therapy**

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A 28-year-old male with a history of primary hypogonadism presented to his optician complaining of blurred vision in his right eye. Primary hypogonadism secondary to bilateral anorchidism had been diagnosed in childhood and intramuscular testosterone injections had been commenced at the age of 10. He had been well at most recent outpatient reviews, with normal testosterone levels on Nebido 250 mg every 12 weeks. He had no other past history and was taking no other medications. He reported that the blurred vision occurred immediately after receiving his testosterone injection, resolved over subsequent weeks, and recurred after his next injection. Initial ophthalmological assessment one week after testosterone injection revealed right-sided central serous chorioretinopathy, with subretinal fluid detected on optical coherence tomography (OCT) scan. The left eye was unremarkable, visual acuity was normal bilaterally and there was no choroidal neovascularization on OCT angiography. The patient was treated with Nepafenac eye drops for 8 weeks. A repeat OCT scan, approximately 7 weeks post-testosterone injection, showed resolution of the subretinal fluid. A decision was made to change the patient’s testosterone regimen from a 12-week intramuscular injection to a topical testosterone gel given the possibility that peak blood levels of testosterone following intramuscular injection were causing his ocular complaint. CSR secondary to testosterone therapy is a rare finding but has been reported previously in the literature. Blurred vision in patients treated with testosterone should prompt an ophthalmology review. The potential for reduced risk of CSR with transdermal testosterone remains a matter of conjecture.

**P59 Challenges in the diagnosis and management of adrenal insufficiency during pregnancy: A case report**

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Adrenal insufficiency (AI) is an uncommon diagnosis in pregnancy. Early recognition of the disease during pregnancy is critical to prevent serious maternal and fetal complications. The diagnosis can be challenging due to the similarity of symptoms between AI and pregnancy itself. There is also a lack of cortisol reference ranges in pregnancy. A 24-year-old previously healthy female, G4 P2+1 at 6/40 presented with collapse, abdominal pain, lethargy, intractable vomiting over a 2-week period. Her B-HCG was inappropriately low for her given gestation. Transvaginal US failed to identify the location of the pregnancy. Free fluid visualized in pouch of Douglas raised the suspicion of ruptured ectopic pregnancy. Subsequently, she underwent diagnostic laparoscopy which failed to identify an extra uterine pregnancy. Post laparoscopy, MM was persistently hypotensive despite adequate fluid resuscitation. Cortisol and ACTH levels were drawn and levels were significantly low for pregnancy. Following repeated cortisol sampling, a diagnosis of adrenal insufficiency was made. TSH was within normal range. An abdominal ultrasound failed to identify adrenal pathology. An MRI pituitary was postponed until post-partum given the contraindication to gadolinium. Given her pregnant status and the severity of her symptoms, she was placed on Hydrocortisone leading to resolution of hypotension and abdominal pain. MM was discharged home on PO steroid and continues to be followed up by endocrine and obstetric services. AI can mimic pregnancy symptoms making the diagnosis very challenging. However, once recognized and treated can result in an uneventful pregnancy.
P60 Pheochromocytoma due to a novel SDHD variant presenting as central retinal vein occlusion

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A 53-year-old female presented with painless loss of vision. Ophthalmological review revealed hypertensive retinopathy and central retinal vein occlusion, with cystoid macular oedema. Her blood pressure was 218/111 mmHg and she was admitted for treatment and assessment of secondary hypertension. Plasma metanephrines showed grossly elevated metanephrine and normetanephrine. Computed Tomography Thorax, Abdomen and Pelvis revealed a 7.8 cm left adrenal mass with central necrosis and an enhancing wall, consistent with pheochromocytoma, with no evidence of extra-adrenal metastasis. Following sufficient alpha-blockade, she proceeded to left adrenalectomy. Post-operative blood pressure was normal on no medications. Genetic analysis was carried out via next generation sequencing and confirmed mosaicism for a novel SDHD variant. However histopathological examination of the resected tumour reported retained SDHB expression with positive granular and cytoplasmic staining. Review of literature revealed interpretation of SDHB staining via IHC is less sensitive in SDHD mutated tumours relative to SDHB due to the weak diffuse signal pattern sometimes described. Other evidence supporting the pathogenicity of this SDHD variant include its absence in a control healthy population and demonstrable evidence of impact on protein function. This case highlights the importance of appropriate interpretation of the large data output from next generation sequencing considering the abundance of novel variants and variants of undetermined significance uncovered. A pathogenic novel SDHD variant was detected in this case thus enabling focused genetic counselling of male offspring considering the parent of origin effect associated with SDHD whereby expression of disease is dependent on paternal transmission.

P61 Familial paraganglioma and pheochromocytoma: A Case report from the West of Ireland

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Paraganglioma and pheochromocytoma are rare neuroendocrine tumours arising from the adrenal medulla or paraspinal ganglia. These tumours may result in symptoms due to catecholamine release and may be malignant and metastasize. Mutations in genes encoding the succinate dehydrogenase protein complex are one example. The index case (AB) was diagnosed paragangliomas in 2004 and 2006, both of which were surgically removed. Several years later his daughter was diagnosed with pheochromocytoma and underwent surgical resection. This led to genetic testing of both individuals and identification of a pathogenic mutation in the SDHB gene (NM_003000.2c.380 T  > Gp. Ile127Ser). Concurrently BD’s cousin (CD) underwent genetic testing after his child was diagnosed with paraganglioma following a lengthy hospital admission. CD and his child were also diagnosed with a germline mutation in the SDHB gene. CD’s father (ED) subsequently admitted to the endocrinology clinic in GUH to undergo screening for the familial mutation identified in his son. This test confirmed that he was a carrier of the same SDHB gene identified in his nephew. His sister, AB’s mother, was also tested and confirmed to carry an SDHB mutation. Genetic testing of other family members is ongoing and all affected individuals have undergone screening with CT-neck, thorax, abdomen and pelvis as well as plasma metanephrines. SDHB mutations give rise to familial pheochromocytoma and paraganglioma. Inheritance of the tumour syndrome is autosomal dominant with an incomplete penetrance of 20–40%. Screening of affected individuals with CT and measurement of plasma metanephrines is recommended.

P62 Unusual sites of papillary thyroid cancer metastasis

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Case 1: An 86-year-old gentleman presented with a palpable lesion located on his right sternoclavicular joint. He was 7 years post thyroidectomy and RAI for high risk pT3 papillary thyroid cancer (PTC). One year later recurrence of PTC in a neck nodule necessitated a central neck dissection and RAI. For a subsequent four years biochemical and radiological surveillance demonstrated a disease-free status. Development of the palpable skin lesion coincided with increasing thyroglobulin (Tg) levels. CT neck and thorax confirmed multiple metastatic deposits including a 12X8 mm soft tissue nodule involving skin corresponding to the gentleman’s palpable lesion. This was treated with RAI. Case 2: A 55-year-old lady was treated with total thyroidectomy, right sided neck dissection and RAI for a multi focal PTCpT1 (m) pN1a, with focal tall cell changes. Two years later increasing Tg levels culminated in the diagnosis of a PET avid 1.5 cm focus in the pancreas [SUV max 17]. Histopathology confirmed a 24 mm metastatic papillary thyroid carcinoma, classic subtype with areas of tall cell changes. This was resected, she received further RAI and a recent PET CT confirmed the absence of FDG positive disease. Papillary thyroid cancer typically metastasizes via the lymphatic system to the neck, cervical chain, lung and bone. Both cases highlight the importance of life-long clinical and biochemical surveillance for timely detection of disease recurrence to atypical sites in high-risk disease. Case two highlights a role for PET CT in cases of non-iodine avid dedifferentiated metastasis not detected using conventional radiological surveillance methods.

P63 Immune checkpoint inhibitor-induced type 1 diabetes mellitus

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We report the case of a 64-year-old woman presenting acutely with a three-day history of polydipsia, polyuria and vomiting. Her medical history was notable for a posterior thorax melanoma excised in 2019 with subsequent metastatic lung involvement. She was commenced on Pembrolizumab, an anti-PD-1 immune checkpoint inhibitor (ICI), and had received seven infusions at three-weekly intervals prior to symptom-onset. On presentation, capillary blood glucose was 41.5 mmol/L with capillary ketones of 2.9. Venous blood gas showed a pH of 6.93, bicarbonate 4.2, lactate 3.4. She was commenced on the diabetic keto-acidosis (DKA) protocol and subsequently transitioned to basal-bolus insulin upon resolution. An autoantibody panel was negative (GAD, IA-2, Zn-8, islet cell), HbA1c 107 mmol/mol, paired C-peptide 217 pmol/L and plasma glucose 15.7 mmol/L. This patient had neither an autoimmune history nor family history of T1DM. This,
coupled with her later onset of symptoms, prompted consideration of a secondary cause, with Pembrolizumab therapy being implicated. iCIs are used in the treatment of various malignancies and have been well-documented to cause numerous endocrinopathies as immune-related adverse events (IRAEs). The anti PD-1 subclass has been associated with the development of type 1 diabetes in up to 2% of patients on such therapy. The average onset from treatment commencement to presentation is 12 weeks. Up to 70% of these patients will present in DKA and lifelong insulin is required. Once plasma glucose and keto-acidosis has corrected and insulin therapy established, iCI therapy can be continued. This case highlights the increasing importance IRAE recognition secondary to iCI therapy.

**P64 Funny TFTs- TSHoma and post-COVID-19 thyroiditis leading to confusing thyroid function tests dynamics: A case report**

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We present the case of a male patient with a diagnosis of TSHoma who became infected with SARS-CoV-2 and developed a post-COVID-19 thyroiditis with resultant confusing changes in his thyroid function tests (TFTs). The patient presented with an incidental finding of elevated Free T4 and inappropriately normal Thyroid-Stimulating Hormone (TSH), confirmed on multiple analytical platforms. A Thyrrotropin-Releasing Hormone (TRH) test showed a flat TSH response, and an Magnetic Resonance Imaging (MRI) pituitary showed a 2.4 cm macro-adenoma. Somatostatin analogue treatment was commenced pending surgery, with rapid normalization of TFTs. The patient then became symptomatic of headache, pyrexia, dysgeusia and anosmia lasting two weeks, at a time when the first wave of the COVID-19 pandemic was affecting Ireland. The patient had been a close contact of two confirmed COVID-19 cases. He did not have a SARS-CoV2 PCR test at the time but later tested positive for COVID-19 spike and nucleocapsid antigen IgG antibodies (vaccine naïve), indicating previous exposure to SARS-CoV-2. Two months after this illness, the patient’s TFTs showed a pattern typical of primary hyperthyroidism with grossly elevated FT4 and fully suppressed TSH (with co-existent thyrotoxicosis symptoms), followed by a pattern of primary hypothyroidism with a low FT4 and high TSH – a pattern consistent with subacute thyroiditis post-viral illness. TSH Receptor Antibodies was negative. The patient’s TFTs later showed high normal TSH and normal FT4 while continuing lanreotide therapy. He is currently euthyroid and awaiting pituitary surgery which was delayed due to the COVID-19 emergency. To our knowledge, this is the first case of post-COVID-19 thyroiditis in a patient with underlying TSHoma.

**P65 A case of adrenal cushing’s syndrome and primary hyperparathyroidism due to an atypical parathyroid adenoma**

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**P66 Subacute thyroiditis following COVID-19 mRNA vaccine**

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Subacute viral thyroiditis is a recognised cause of thyrotoxicosis which usually presents neck pain and hyperthyroidism after an acute viral illness. Several viruses including SARS CoV-2 have been implicated. The occurrence of thyroiditis has also been reported following hepatitis B and influenza vaccination. Here we report a case of subacute thyroiditis following mRNA COVID-19 vaccine administration. A 43 year old male presented 8 days following receiving an mRNA COVID-19 vaccine (Comirnaty) with neck pain, sore throat, palpitations, heat intolerance and weight loss. Examination with his GP showed a regular HR of 80 bpm and BP 116/80. Investigations showed a TSH < 0.01 mU/L (0.27–4.20), fT4 33.2 pmol/L (12.0–22), TSH receptor antibodies (TRAb) were negative. He was not commenced on any treatment. Repeat TFTs 12 days later revealed a TSH < 0.01 and fT4 16.3. He was subsequently referred to endocrinology outpatient for further assessment. On review in outpatient, he was then asymptomatic. On examination he was clinically euthyroid and there was no goitre or evidence of ophthalmopathy. Thyroid function tests repeated at this time, approximately two months following vaccine administration showed TSH 4.28, fT4 12.1 and fT3 4.7 pmol/L (3.1–6.8). Thyroiditis has only been very rarely reported following mRNA COVID-19 vaccination. However, with the very high volume of primary and booster vaccine dose administration, both at present and in the future, it should be considered in all patients who present with thyrotoxicosis following vaccination particularly when TRAb is negative.

**P67 Subacute thyroiditis following Sars-CoV-2 infection**

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A 32-year-old female tested positive to Sars-CoV2 (Coronavirus-19) in November 2020. She experienced mild symptoms at this time, not requiring hospitalisation. She was referred to the Cardiology service in February 2020 with palpitations and was noted to be tachycardic. She had no past medical history of note and was on no medication. Investigations at this time demonstrated a suppressed TSH of < 0.01(0.4–4.0 mU/L) and elevated FT4 of 28.6(12–22 pmol/L). When reviewed in the thyroid clinic, she was experiencing fatigue, lethargy and palpitations. Investigations were subsequently referred to endocrinology outpatients for further assessment. On review in outpatients, he was then asymptomatic. On examination he was clinically euthyroid and there was no goitre or evidence of ophthalmopathy. Thyroid function tests repeated at this time, showed a suppressed TSH of  < 0.01(0.4–4.0 mU/L) and elevated FT4 of 12.1(12.0–22). Thyroiditis has only been very rarely reported following mRNA COVID-19 vaccination.
Table 1

|          | October 2020 | December 2020 | March 2021 | April 2021 | May 2021 | June 2021 |
|----------|--------------|---------------|------------|------------|----------|-----------|
| TSH (0.44-0.00 mU/L) | 1.6 | <0.05 | <0.05 | 4.98 | 3.72 | 3.90 |
| FT4 (12-22 pmol/L) | 15.6 | 28.6 | 17.6 | 11.1 | 12.8 | 12.9 |
| FT3 (3-6.5 pmol/L) | 7.2 | 5.3 |
| TRAb (<1.8 mU/L) | <0.8 |

The first case of subacute thyroiditis following Sars-CoV-2 infection was described in Italy in July 2020. Since then, there have been approximately 22 cases reported in the literature. This to our knowledge is the first case described in Ireland.

P68 Subacute Thyroiditis Post Pfizer-BioNTech mRNA vaccination for COVID-19

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P69 Multifactorial polyuria in a patient with profound hypercalcaemia

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Hyperparathyroid crisis is a rapid and severe elevation in serum calcium levels rarely associated with primary hyperparathyroidism and more concerning for malignancy. An atypical parathyroid adenoma (APA) is difficult to distinguish from carcinoma as there are histologic features that are clearly benign but associated with worrisome malignant features. There are no clear guidelines on how to follow up patients with APA and there is concern of transformation into a malignant lesion. A 48-year-old female with a two-week history of poor appetite, nausea and fatigue presented to the emergency department. She was noted to have profound hypercalcaemia of 6 mmol/l with a concomitant parathyroid hormone concentration of 2596 pg/mL (15-65), vitamin D levels were undetectable (<12.5 mmol/L). CT TAP showed widespread lytic lesions, and a 12 mm probable parathyroid adenoma. Biopsy of the thyroid lesion confirmed histologic features of a brown tumour. Intramuscular ergocalciferol was commenced. Repeat PTH was 197 pg/mL with vitamin D 40 mmol/l, alkaline phosphatase 269 IU/L, calcium 2.8 mmol/l. Repeat calcium below 3 mmol/l. Her PTH subsequently normalised and she was discharged home well. Parathyroid histology was equivocal for malignancy.

P70 Case report: A lytic bone lesion in a 16-year-old female with knee pain

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A 16-year-old girl presented to the Emergency Department with right knee pain. She had a normal birth and developmental history, was a practicing Muslim, living in Ireland for 8 years. Examination revealed a full range of motion of her knee and she could weight bear, with no proximal myopathy. X-ray revealed a lytic lesion in the proximal tibia concerning for a neoplasm. Full blood count, renal, liver profiles were normal, calcium 2.64 mmol/L (2.1-2.55 mmol/L), albumin 47 G/L (40-49), alkaline phosphatase 2867 IU/L (14-147) phosphate 0.83 mmol/l (0.81-1.45 mmol/L). Hand x-rays demonstrated osteitis fibrosis cystica and a well-defined lucency in the fourth metacarpal shaft representing a brown tumour. Parathyroid hormone (PTH) was 1389 pg/mL (15-65), vitamin D levels were undetectable (<12.5 mmol/L). CT TAP showed widespread lytic lesions, and a 12 mm probable parathyroid adenoma. Biopsy of the tibial lesion confirmed histologic features of a brown tumour. Intramuscular ergocalciferol was commenced. Repeat PTH was 197 pg/mL with vitamin D 40 mmol/L, alkaline phosphatase 269 IU/L, calcium 2.8 mmol/L. Repeat calcium below 3 mmol/l. Her PTH subsequently normalised and she was discharged home well. Parathyroid histology was equivocal for malignancy.

P71 Thyroid dysfunction secondary to African herbal medicine

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A 61-year-old African gentleman attended his GP with fatigue and thyroid function tests demonstrated a suppressed TSH of <0.01 (0.4-4.0 mU/L) and elevated Free T4 of 52 (12-22 pmol/L). There was no history suggestive of thyroiditis. He denied any autoimmune disease and was on no medication. His pulse rate was 95 bpm and there was no evidence of thyroid eye disease. Examination demonstrated no goitre. His anti-TSH receptor antibody (TRAb) was negative. Tc-99 m Pertechnetate (Tc-99 m) scan showed uniformly decreased uptake of radiotracer to the thyroid gland. Concurrent thyroglobulin (Tg) was preserved at 4.6 (1.6-61.3 ng/ml). On further questioning he admitted to intermittent use of Garcinia kolaar Bitter Kola nut as it is known, a herbal medicine commonly consumed in rural Africa. In the following 18 months, 4 African men presented with similar perturbation of thyroid function tests (Table 1). In 3 cases, the patients admitted to taking Bitter Kola nut and in one case taking Hunteria umbellate seeds (Abere seeds), which are also commonly consumed in rural Africa. On cessation of the herbal medicines, thyroid function tests returned to normal without treatment. This is the first case series describing effects of Bitter Kola and Abere seeds on thyroid hormone measurement. Additional studies are required to elucidate the mechanism underlying this.
P72 A case of Graves’ disease pre-treated with Lithium carbonate prior to radioactive iodine therapy

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The mainstay of treatment for Graves’ Disease (GD) involves pharmacotherapy with thionamides, radioactive iodine therapy (RAI) or surgery. Lithium therapy has demonstrated benefit in the treatment of GD, prior to definitive therapy, in cases where traditional antithyroid drugs are contraindicated. It can also potentiate the therapeutic effect of RAI, by promoting iodide retention in the thyroid gland. A 52-year-old female, with background of type 1 diabetes, was newly diagnosed with GD (FT4 43.5 pmol/l (0.9-20.0), FT3 15.9 pmol/l (2.6-4.9), TSH <0.01 mU/L (0.35-4.94), TSH receptor antibody 5.9 IU/l (< 1.8), Pertechnate uptake 5.4% (0.5-4%)). High dose carbimazole therapy was commenced. One month later, she was admitted with diabetic ketoacidosis and abnormal liver function tests (LFTs) (alanine aminotransferase 262 IU/L (0-55), alkaline phosphatase 463 IU/L (30-130) and gamma-glutamyl transferase 262 IU/L (0-55), alkaline phosphatase 463 IU/L (30-130) and gamma-glutamyl transferase 262 IU/L (0-55)). Following ultrasound, magnetic resonance imaging and laboratory workup, working diagnosis was thionamide-induced hepatic injury. Carbimazole was discontinued. LFTs improved, though never normalised off therapy. Hyperthyroidism persisted. Lithium carbonate was commenced as bridging therapy for RAI. TFTs initially improved, however lithium dosage was reduced due to supratherapeutic drug levels.463 MBq iodine-131 was administered. Ten weeks later, she was admitted with non-ST-elevation myocardial infarction, awaiting surgery. Persistently thyroctic, carbimazole was restarted with careful monitoring of LFTs. Eighteen weeks post RAI, Carbimazole was discontinued and L-thyroxine commenced. Lithium has previously been shown to be useful where thionamides are contraindicated. However, in this case, careful clinical observation with carbimazole re-introduction proved an effective strategy of introducing remission of GD, while awaiting RAI to take full effect.

P73 Pembrolizumab related adrenal failure of different aetiology – two case reports of primary and secondary hypoadrenalism

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Immune checkpoint inhibitors (ICI) have transformed cancer treatment but are occasionally associated with endocrine adverse effects. Patients receiving single-agent Pembrolizumab (a PD-1 inhibitor) have a low risk of ACTH deficiency secondary to hypophysitis of between 0.5% and 1%. Adrenalitis is an even rarer complication of pembrolizumab, with only 15 published case reports. Here we describe two different presentations of adrenal insufficiency, with one patient having co-existing thyroiditis. A 62-year-old woman who received single-agent pembrolizumab for non-small cell lung cancer presented acutely with marked fatigue, brain fog, nausea, diffuse arthralgia but no weight loss. Morning cortisol level was markedly low at 31 nM with an undetectable ACTH and normal aldosterone and renin, indicating central adrenal insufficiency. Her other pituitary profile was normal. Hydrocortisone treatment resulted in rapid resolution of her symptoms. Pituitary MRI showed no structural lesion. A 70-year-old lady receiving Pembrolizumab presented with lethargy, hypotension, hyponatraemia and potassium of 6.1 mmol/l. Random serum cortisol was markedly low at 36 nM with an elevated ACTH of 556 ng/l, in addition to biochemical severe primary hypothyroidism. She had low aldosterone, raised renin and positive anti-adrenal antibodies, confirming the diagnosis of primary adrenal failure. She responded rapidly to hydrocortisone and fludrocortisone treatment, followed by thyroxine replacement. Her weight improved from 44.2 kg to 49.1 kg at one-month follow-up. These cases highlight the spectrum of adrenal failure associated with ICI. A high index of suspicion is needed in patients receiving ICI, including pembrolizumab. The distinction of primary from secondary hypoadrenalism is essential for appropriate treatment.

P74 Mixed pituitary adenoma-gangliocytoma presenting as acromegaly

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A 56-year-old female was referred to pituitary endocrinology after incidental finding of a pituitary mass. She had a four-year history of headaches, hypertension and obstructive sleep apnoea. Ring size had increased over two years and she had neck arthropathy. She denied excessive sweating or change in facial features. Visual fields were full to confrontation. She displayed mild acromegalic features, with macroglossia and soft tissue swelling of the hands. Biochemistry revealed an elevated IGF-1 at 248.2 ng/ml (48 – 187) with suppression of growth hormone (GH), to nadir of 0.18 ng/ml, during OGTT. Dynamic anterior pituitary function was normal. MRI identified a pituitary macroadenoma extending to the optic chiasm. Visual fields were full by Goldman perimetry. Transsphenoidal surgery achieved successful removal of the lesion. Histology revealed infiltration of the pituitary by large, abnormally clustered ganglion cells, consistent with a gangliocytoma. In addition, a microscopic, sparsely granulated adenoma was present. Neither lesion demonstrated GH expression. Postoperative anterior pituitary function was intact, IGF-1 was 194.5 ng/ml (43 – 176), nadir GH was <0.18 ng/ml during OGTT. The patient’s symptoms subjectively improved, with resolution of headaches and sleep apnoea. Blood pressure improved postoperatively, reaching control with two agents. Pituitary gangliocytomas account for 0.14 – 1.42% of all sellar lesions. Radiologically indistinguishable from macroadenomas, there is a co-existing pituitary adenoma in 85% of cases, frequently GH-secreting adenomas. Gangliocytomas may secrete Growth Hormone Releasing Hormone, with consequent acromegalic presentation, similar to our patient. This case illustrates subtle biochemical and clinical presentation of acromegaly, and the possibility of causative lesions other than pituitary adenoma.
P75 Acute intermittent porphyria presenting with severe hyponatraemia

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Porphyrias are a group of inherited disorders of heme biosynthesis. Acute intermittent porphyria (AIP) is the most common and most severe caused by an inherited deficiency of porphobilinogen deaminase. We present the case of a 32-year-old female who presented to the emergency department with confusion, vomiting and diarrhoea. Her past medical history was significant for hypothyroidism and anxiety. On examination she was hypertensive, with an ataxic gait and mild abdominal tenderness. Laboratory investigations revealed a hyponatraemia of 113 mmol/L, serum osmolality of 236 mmol/kg, urine sodium of 180 mmol/L and urine osmolality of 673 mmol/kg. She seized in the department and was treated with 3% hypertonic saline. Due to a distant family history of porphyria a porphyria screen was performed which was positive for uroporphobilinogen. She was treated with heme arginase for 3 days. She improved clinically, her uroporphobilinogen levels dropped steadily and her sodium normalized. Acute attacks of AIP can be precipitated by medications, smoking, sex hormones, fasting and stress. They can present with a variety of symptoms including gastrointestinal symptoms and autonomic and CNS involvement. Hyponatraemia occurs in 20% of cases due to SIADH or gastrointestinal or renal sodium losses. Diagnosis is confirmed by a urinary sample for porphobilinogen. If positive then plasma and stool porphyrin are also tested.

P76 Bladder Paraganglioma presenting as post-micturition syncope

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Bladder paragangliomas are rare Chromaffin cell tumours and may present with atypical symptoms leading to delayed or missed diagnosis. A 22-year-old female presented with a twelve-year history of intensifying paroxysms of anxiety, palpitations and recurrent syncope following micturition. The patient had been attending young-adult mental health services for these symptoms, however was referred to endocrinology upon discovery of hypertension. Extended family history revealed metastatic phaeochromocytoma and paraganglioma in two grand-uncles. Clinical examination was unremarkable apart from hypertension, mean 24 h ambulatory blood pressure of 150/100 mmHg. Supine plasma normetanephrine and metanephrine were markedly elevated (8874 pmol/l, reference range 0–1180) with a slightly raised 3-methoxytyramine (198 pmol/l, reference range 0–180). Plasma metanephrines were normal. Computed tomography identified a 4.4 cm mass at the right inferolateral margin of the bladder wall. Scintigraphic imaging using I-131 labelled metiodobenzylguanidine (MIBG) showed positive tracer uptake consistent with a bladder paraganglioma but no pathological uptake elsewhere.

P77 A 1 in 10 million tumour

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Cardiac paragangliomas are rare neuroendocrine tumours that are often difficult to excise due to their location. A 51 year old gentleman presented with chest pain and palpitations, with a background of type 2 diabetes and hypertension. An echocardiogram showed external compression of the right atrial wall and coronary angiogram identified a vascular lesion supplied by the right coronary artery. An FDG-PET identified an avid lesion adherent to the right atrium. Biopsy of the lesion was reported as positive for Synaptophysin and Vimentin. Biochemical testing revealed urine normetadrenaline and metadrenaline levels dropped steadily and her sodium normalized. Acute attacks of AIP can be precipitated by medications, smoking, sex hormones, fasting and stress. They can present with a variety of symptoms including gastrointestinal symptoms and autonomic and CNS involvement. Hyponatraemia occurs in 20% of cases due to SIADH or gastrointestinal or renal sodium losses. Diagnosis is confirmed by a urinary sample for porphobilinogen. If positive then plasma and stool porphyrin are also tested.

P78 Pancreatic paraganglioma: Histological diagnosis post-operatively in suspected pancreatic neuroendocrine tumour

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Pancreatic paraganglioma is a rare entity and often a post-operative diagnosis. Here we report a case of a 64-year-old woman with a sporadic non-functional localized pancreatic paraganglioma. The pre-operative diagnosis was a pancreatic neuroendocrine tumour because of the peripheral early arterial enhancement on the computed tomography (CT) scan. The tumour was 25 mm in size and fully resected. There was no clinical evidence of catecholamines excess before or during the operation. The resected tumour showed solid nests of cells (“zellballen”) with enlarged nuclei, stippled (“salt and pepper”) chromatin and abundant granular eosinophilic cytoplasm was seen within a rich vascular stroma with Ki-67 of 4% and no mitosis. The patient recovered well from the surgery.
with no evidence of radiological recurrence and normal metanephrines. Next generation sequencing did not reveal a germline mutation known to predispose to paraganglioma. We are following-up the patient with annual CT scan and biochemistry. To our knowledge, there are only 37 cases of pancreatic paraganglioma reported in the literature.

**P79 Recurrent cushing’s syndrome secondary to ACTH-secreting bronchial carcinoid Tumour with complete tumour and biochemical response to somatostatin receptor ligand therapy**

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We describe a case of Cushing’s syndrome secondary to ectopic adrenocorticotropic hormone (ACTH) secretion from a bronchial carcinoid tumour and early detection of recurrence.

This 66-year-old patient presented with clinical and biochemical features of ACTH dependent Cushing’s syndrome. A pulmonary neuroendocrine tumour (NET) was identified and resected. Radiolabelled octreotide scan was negative. The patient was biochemically and clinically cured of Cushing’s syndrome following resection of NET. Histology confirmed bronchial carcinoid with ACTH positive immunohistochemistry. The patient was monitored closely, overnight dexamethasone suppression tests (ONDST) and salivary cortisol levels were persistently normal. Following 10 years, a failed ONDST with cortisol measuring 58 nmol/L (normal < 50 nmol/L) and elevated salivary cortisol between 2.1 nmol/L and 5.3 nmol/L (normal < 2.6 nmol/L) prompted investigation. Octreotide scan confirmed tumour recurrence with abnormal uptake in the left infraorbital region. The patient displayed no clinical manifestations of Cushing’s syndrome and was not a suitable candidate for surgical resection. Subsequently, after three years the patient experienced recurrence of Cushing’s syndrome with hypertensive crisis (BP 220/130 mmHg). Treatment with metyrapone 500 mg QDS for one month, and lanreotide 120 mg subcutaneously once monthly was initiated. Following one year of lanreotide therapy, an octreotide scan demonstrated resolution of the area of previous abnormal uptake. The patient remains in biochemical remission with a morning cortisol of 247 nmol/L (reference range 166-507 nmol/L) and clinical features of Cushing’s syndrome have resolved. This case highlights the potential utility of somatostatin receptor ligand therapy in this patient cohort, with potential for clinical, biochemical and radiological remission.

**P80 Acute peri-orbital inflammation associated with intravenous bisphosphonate therapy in a patient with primary hyperparathyroidism**

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Intravenous bisphosphonate therapy is commonly prescribed in the management of osteoporosis, Paget’s disease and severe hypercalcaemia. Ocular and peri-orbital inflammatory reactions are a recognised but infrequent complication of intravenous and oral bisphosphonate therapy. Our case is of a 62-year-old man with severe symptomatic PTH-mediated hypercalcaemia on a background of renal calculi, hypertension, hypertlipidaemia and spinal compression surgery. Biochemistry was consistent with primary hyperparathyroidism (fractional Calcium excretion 0.038, PTH 22.1 pmol/L, Corrected calcium 3.2 mmol/L). Intravenous hydration and intravenous zoledronic acid 4 mg was prescribed. Twelve hours later, new onset right sided headache and generalised arthralgia was reported. 36 h post infusion, low grade pyrexia with onset right sided scleral injection developed. Further progression over the following 24 h required urgent ophthalmological review for marked periorbital oedema, chemosis, non-pulsatile tender 4 mm proptosis, ophthalmoplegia and decreased visual acuity (6/24 affected eye). CRP was elevated (99 mg/L) with normal white cell count. CT orbits, CT venogram and CT angiogram indicated right sided prespectal soft tissue swelling and diffuse retro-orbital fat stranding concerning for cellulitis with no evidence of venous sinus thrombosis or AV fistula. Antimicrobial treatment was commenced for possible peri-orbital cellulitis. Two weeks post symptom onset, periorbital inflammation had resolved and visual acuity normalised. Calcium improved to 2.68 mmol/L on cinacalcet. Imaging confirmed left parathyroid adenoma and urgent parathyroidec tomy is awaited. He is not for further bisphosphonate therapy. This case reminds us to be cognisant of the signs and symptoms of orbital inflammation that can result rarely in association with bisphosphonate therapy.

**P81 Levothyroxine dose adjustment to achieve optimal TSH**

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Levothyroxine (LT4) treatment for hypothyroidism is one of the most prescribed medications world-wide. Some studies suggest up to 45% of treated patients fail to achieve biochemical treatment goals. Adjustment of levothyroxine dosing is a common treatment decision in endocrine practice. Final LT4 dose requirements and individual dosing decisions are dependent on multiple factors including patient weight, aetiology of hypothyroidism, T4 and TSH level. We aimed to audit efficacy of dose changes in routine clinical practice, to determine final dose requirement in an Irish population of patients with hypothyroidism, and to attempt to define optimal dose adjustments. 105 patients with hypothyroidism and elevated TSH or ongoing symptoms in the setting of high-normal TSH were studied. The number of dose adjustments to achieve final TSH, final LT4 dose, percentage dose adjustments were reviewed. Mean TSH prior to dose adjustment was 6.1 mU/L ± 3.3, mean final TSH 1.63 mU/L ± 1.25. Mean final dose requirement was 1.39 mg/kg/day ± 0.47. 57 patients achieved final TSH with 1 dose adjustment, 45 with 2, 3 with 3. Mean dose adjustment required to meet final TSH was 1.172 mg/kg/week ± 0.67, 14.7% of previous weekly dose. Optimal TSH in patients on LT4 be achieved with careful dose adjustment and close follow-up.

**P82 A case of gynaecomastia and tremor in an adolescent male**

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Kennedy’s Disease (KD) is a rare X-linked recessive condition due to CAG repeat in the androgen receptor (AR) gene. KD affects males with unaffected female carriers. Reported prevalence in male populations is variable; recent data suggests 2.5 in 100,000. KD manifests as androgen insensitivity (AI) with features including gynaecomastia and associated motor signs such as early tremor, facial/bulbar muscle dysfunction and slowly progressive proximal limb weakness. We present a 16-year-old male with gynaecomastia. He had normal birth and development with no other relevant personal history. Clinically, he was eugonadal and euthyroid. There was marked upper limb...
tremor but no other motor symptoms. Testosterone 54 nmol/L with correspondingly high LH and normal oestradiol. Other pituitary hormones normal. Beta-HCG, ultrasound testes, MRI adrenals/putitory normal. Several male relatives were previously diagnosed with motor neurone disease (MND) with unaffected females suggesting X-linked inheritance. Given family history (FH), along with AI and tremor, he was referred to neurology and genetics. Initial AR gene analysis was negative for abnormalities, but specific KD abnormality testing confirmed diagnosis. Patient’s priority was excision of gynaecomastia to good effect. KD is often misdiagnosed as MND, due to features of progressive motor neuropathy, and underdiagnosed, due to rarity and limited awareness, so true prevalence could be underestimated. Gynaecomastia and tremor may be sole early manifestations. Genetic testing for KD should be considered in men with AI and a relevant FH or with tremor or motor neuropathy. Specific analysis for KD genetic abnormalities should be requested as initial analysis may be normal.

P83 Management of severe hypokalaemia induced by ectopic ACTH release in patient with small-cell lung cancer

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Ectopic ACTH release is a rare cause of ACTH dependent Cushing’s Syndrome. This case report details a case of severe hypokalaemia induced by ectopic ACTH release in a patient with metastatic small-cell lung cancer. Patient presented with nausea, vomiting and lethargy. Initial bloodwork showed serum potassium of 1.8 mmol/L. Due to severity of electrolyte disturbance and rates of intravenous replacement required patient was transferred to HDU for cardiac monitoring and replacement therapy. Patient potassium requirements averaged between 200–240 mmol per day while in HDU to maintain potassium levels between 3.5–4 mmol/L. Patient also displayed marked hypertension while in HDU with SBP ranging from 160–200 mmHg. Patient underwent overnight dexamethasone suppression test where there was failure to suppress with value of 1976. With Cushing’s Syndrome confirmed ACTH then returned at 537 ng/L indicating ACTH dependent process. High dose dexamethasone suppression test then completed without significant suppression of cortisol indicating ectopic ACTH release. Metyrapone and spironolactone therapy were instituted. Some improvement in blood pressure readings but ongoing high potassium requirements. Concern then of metyrapone use leading to accumulation of mineralocorticoid precursors and more significant hypokalaemia. Ketoconazole added as second steroidogenesis inhibitor and titrated of 400 mg BD. Eventual decline in potassium requirements following aggressive fluid therapy and avoided dialysis. She made a full neurological recovery with the subsequent normalisation of calcium and PTH levels. Lithium therapy was withdrawn without relapse of psychiatric symptoms and GORD was successfully managed with omeprazole. The diagnosis of Milk Alkali syndrome was confirmed by increased plasma calcium and PTH levels. Her home blood pressure recordings in preceding days were all elevated (as high as >200/105 mmHg). Laboratory testing was remarkable for severe hypercalcæmia 4.66 mmol/L (2.15–2.50), accompanied by an incompletely suppressed parathyroid hormone level of 18 pg/ml (15–65 pg/ml). The diagnosis of Milk Alkali syndrome complicated by PTH secretion related to Lithium therapy was made. She had an acute kidney injury with serum creatinine of 331μmol/L. She required intubation and intensive care management. Her serum lithium levels were in therapeutic range at 0.73 mmol/L. Magnetic resonance imaging (MRI) of the brain demonstrated evidence of posterior reversible encephalopathy syndrome (PRES). She responded to aggressive fluid therapy and avoided dialysis. She made a full neurological recovery with the subsequent normalisation of calcium and PTH to 2.46 mmol/l and 47 pg/ml respectively. Her renal function returned to normal. Lithium therapy was withdrawn without relapse of psychiatric symptoms and GORD was successfully managed with proton pump inhibitor therapy. Severe hypercalcæmia alone has been implicated in the development of PRES independent of blood pressure. This case highlights the potential interactions between lithium therapy and high dose calcium carbonate leading to life threatening Milk alkali syndrome.

P84 Pfizer/BioNTech Covid-19 vaccination associated with increased uptake at axillary lymph nodes on Ga-68 PET/CT: A case report

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A 35-year-old man was referred with a 3-year history of abdominal pain and recent weight loss. Abdominal imaging showed a 7.1 x 6 cm necrotic retroperitoneal mass posterior to the uncinate process. This was suspicious for a paraganglioma of the organ of Zuckerkandl. He had elevated plasma normetanephrine (5280 pmol/L - 7 x upper limit of normal (ULN)) and 3-methoxytyramine (3720 pmol/L - 20 x ULN). He was commenced on alpha blockade. Gallium-68 positron emission tomography/Computerised tomography (Ga-68 PET/CT) was performed for anatomical delineation in the pre-operative period. He had received the Pfizer/BioNTech Covid-19 vaccine injected into the left deltoid 2 days prior to PET/CT imaging. Prominent uptake was noted in the left deltoid and several mild enlarged but morphologically normal axillary lymph nodes were noted. Increased axillary lymph node or ipsilateral deltoid uptake of Gallium has been observed on PET/CT imaging in vaccinated patients within 6 weeks of vaccination with either Pfizer/BioNTech or Moderna Covid-19 vaccines. 1 This is not reflective of metastatic paraganglioma. Awareness of this phenomenon is important to avoid unnecessary investigations and patient anxiety. Reference: Lehman C, D’Alessandro H, Mendoza D, Succi M, Kambadakone A, Lamb L. Unilateral Lymphadenopathy After COVID-19 Vaccination: A Practical Management Plan for Radiologists Across Specialties. Journal of the American College of Radiology. 2021;18(6):843–852.

P85 A rare cause of hypercalcaemic crisis with posterior reversible encephalopathy

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A 40–year–old woman with a history of gastro–oesophageal reflux disease (GORD), hypertension and bipolar affective disorder (BPAD) presented with status epilepticus. In the months prior to admission inadequate control of her dyspeptic symptoms led to ingestion of large quantities of over the counter antacid medications containing calcium carbonate. Her home blood pressure recordings in preceding days were all elevated (as high as >200/105 mmHg). Laboratory testing was remarkable for severe hypercalcæmia 4.66 mmol/L (2.15–2.50), accompanied by an incompletely suppressed parathyroid hormone level of 18 pg/ml (15–65 pg/ml). The diagnosis of Milk Alkali syndrome complicated by PTH secretion related to Lithium therapy was made. She had an acute kidney injury with serum creatinine of 331μmol/L. She required intubation and intensive care management. Her serum lithium levels were in therapeutic range at 0.73 mmol/L. Magnetic resonance imaging (MRI) of the brain demonstrated evidence of posterior reversible encephalopathy syndrome (PRES). She responded to aggressive fluid therapy and avoided dialysis. She made a full neurological recovery with the subsequent normalisation of calcium and PTH to 2.46 mmol/l and 47 pg/ml respectively. Her renal function returned to normal. Lithium therapy was withdrawn without relapse of psychiatric symptoms and GORD was successfully managed with proton pump inhibitor therapy. Severe hypercalcæmia alone has been implicated in the development of PRES independent of blood pressure. This case highlights the potential interactions between lithium therapy and high dose calcium carbonate leading to life threatening Milk alkali syndrome.

Diabetes, Obesity and Metabolism

P86 Impact of COVID-19 lockdown on glycaemic control in young adults with Type 1 diabetes mellitus

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SGLT2 inhibitors are safe and effective in patients with normal BMI and on insulin therapy

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Type 2 diabetes results in significant morbidity and mortality. Sodium-glucose-cotransporter-2-inhibitors (SGLT2is) have proven cardiovascular and renal benefit. However, recommendations urge caution when using SGLT2is in patients with normal BMI and/or on insulin therapy. We performed a retrospective review to assess the efficacy and safety of SGLT2is in patients with type 2 diabetes with BMI ≤ 27 kg/m² and/or on insulin therapy prior to starting on SGLT2 therapy. Total study population was 56 with median age 66 years (range 47–87), 69.9% male, 100% Caucasian. Mean duration of diabetes was 15.4 years (SD 6.2). 66% were on insulin prior to SGLT2i initiation. Overall HbA1c improved by median 9 mmol/mol following initiation of SGLT2is (p = 0.0003). There was no significant difference in HbA1c reduction between those with BMI ≤ 27 and BMI > 27, or between those on insulin compared with the insulin naïve. Weight did not significantly reduce in any patient group following SGLT2i introduction. C-peptide was measured before SGLT2i initiation in 55% of patients—median 1098 pmol/L (range 232–3086). There was no significant difference in C-peptide between those with BMI ≤ 27 and BMI > 27, or between those on insulin compared with the insulin naïve. The degree of HbA1c reduction seen was not predicted by age, duration of diabetes, duration of insulin therapy, or pre-treatment C-peptide level. No cases of diabetic ketoacidosis or other adverse events were seen. In conclusion, SGLT2i were safe and effective at reducing HbA1c regardless of BMI, insulin use or duration of diabetes. Reference: Brown P. How to use SGLT2 inhibitors safely and effectively. Diabetes and Primary Care. 2021;23:1
engagement with the diabetes service by bringing care to patients in the dialysis unit. Successful scale up and sustainability shall require additional funding.

**P90 HbA1c evaluation predicting hyperglycemia and avoiding morbidity in steroid initiation**

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Steroids can precipitate significant hyperglycaemia and Diabetes Mellitus in vulnerable populations including DM, pre-DM and the elderly. Steroid risks include deterioration in DM, glucose toxicity, HONK and HHS. This may be avoided by a simple screening HbA1c, which could prompt a ‘safeguard algorithm’ for the patients including instruction in glucose monitoring. The ‘at risk’ cohort is identified, and a surveillance regimen is implemented. We conducted a pilot study, assessing the prevalence of HbA1c screening pre-steroids commencement. This was a prospective study, identifying all patients (medical, surgical and oncological admissions / inpatients) in the BSH Cork, commencing steroid therapy. Of 49 patients commenced on steroids, 8/49 (16%) patients had an HbA1c measurement prior to treatment, ranging from 45–134 mmol/mol. The results highlight low level HbA1c testing pre steroids. 94% of steroid induced hyperglycaemia develops within 48 h of initiation (1), when most patients are still inpatients. 41/49 patients were not tested and are at risk for steroid induced hyperglycaemia. Of those tested, all were in ‘at-risk category’ (HbA1c ≥ 42 mmol/mol). This may suggest a limitation in our study, in so far as, all those tested may have been known to be hyperglycaemic and the true screening value may be lower. Nonetheless, a simple HbA1c will identify those ‘at-risk’ for targeted glucose monitoring on steroids, ideally in hospital. This may minimize the risk of readmission and morbidity with HONK/HHS. Reference: Fong AC, Cheung NW. The high incidence of steroid-induced hyperglycaemia in hospital. Diabetes Res Clin Pract. 2013 Mar;99(3):277–80. https://doi.org/10.1016/j.diagres.2012.12.023

**P91 Lipid levels in early pregnancy as a predictor for the development of gestational diabetes mellitus**

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Gestational diabetes (GDM) is a common complication of pregnancy. It is known that women with GDM have a different metabolic lipid profile (having higher triglycerides and lower HDL levels) compared to women with normal glucose tolerance (NGT). Therefore, we hypothesized that lipid abnormalities in early pregnancy (<14 weeks gestation) have potential clinical utility for identifying women at risk of subsequently developing GDM. This was a prospective study that included 124 women with NGT and 54 women with GDM. All women were White European and there was no significant difference between groups in terms of age, parity or blood pressure. Total cholesterol, triglycerides, LDL and non-HDL concentrations in blood were higher and HDL levels lower in early pregnancy in women who subsequently develop GDM (p < 0.05). We assessed the prediction power of each of the components of the lipid panel and combination models. First trimester triglycerides generated an area under the curve (AUC) of 0.72 (95% CI 0.63–0.80). The addition of further lipid components to the prediction models did not increase its value. After adjustment for age and BMI, the AUC increased to 0.84 (95% CI 0.77–0.91). There was a strong correlation between first trimester triglyceride levels and the fasting, 1-h and 2-h glucose values on the oral glucose tolerance test (p < 0.05). First trimester HDL generated the lowest AUC at 0.33 (95% CI 0.24–0.42). First trimester triglycerides have the potential to be a valuable tool in identifying patients at risk of developing GDM and could be a valuable addition to GDM screening protocols.

**P92 Development and validation of a method to measure glycated CD59 (gCD59) in plasma**

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The Oral Glucose Tolerance Test (OGTT) at 24–28 weeks gestation is a robust test in diagnosis of gestational diabetes (GDM). The OGTT is time consuming, inconvenient and has poor reproducibility. Recent studies promulgate glycated CD59 (gCD59) as a promising alternative to the OGTT. Measurement of gCD59 is complex and currently the assay is not commercially available. This study aimed to optimise and validate a simplified method for measuring plasma gCD59. Two methods to separate gCD59 from total CD59 in plasma were evaluated: (1) BRIC-229 antibody (binds only to non-glycated CD59) and (2) Sodium borohydride (NaBH4; binds only to gCD59). Based on the optimisation study, NaBH4-based method was selected and gCD59 was subsequently measured using a CD59 enzyme-linked-immunosorbent-assay. Comparison with the published method was performed: plasma samples collected in trimester-1 (<14 weeks gestation) and trimester-2 (24–28 weeks gestation) from 50 women with GDM and 100 non-diabetic pregnant women matched for age, BMI, ethnicity and gestational age. Overall assay imprecision at mean CD59 concentrations of 31.5 pg/ml, 125.2 pg/ml and 493.6 pg/ml was 5.6%, 2.5% and 100%, respectively. In conclusion, a simplified precise method for gCD59 from the newly developed assay and the published method respectively were comparable. Inclusion of an algorithm for gCD59 in plasma was developed. Reference: Ghosh P, Laque-Fernandez MA, Vaidya A, Ma D, Sahoo R, Chove M, et al. Plasma Glycated CD59, a Novel Biomarker for Detection of Pregnancy-Induced Glucose Intolerance. Diabetes Care. 2017;40(7):981–984. https://doi.org/10.2337/dc16-2598

**P93 Comparison of HbA1c measurement in remotely prepared capillary versus standard venous blood samples**

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The CoVid-19 pandemic has disrupted routine HbA1c testing. This has led to difficulties in monitoring glycaemic control and identifying people whose glycaemic control is not to target. Delayed detection of diabetes and prolonged suboptimal control can increase the risk of developing long-term complications of diabetes. The use of remote blood collection for routine HbA1c testing has the potential to facilitate and support virtual consultations. The aim of this study was to assess the clinical performance and user acceptance of capillary blood samples prepared remotely (at home) using the MiniCollect® capillary blood collection device as an alternative to blood collection by venepuncture for HbA1c analysis. Adult men and women with any type of diabetes were recruited. Following informed written consent, eligible participants attending routine clinic appointments were asked to provide a venous blood sample and subsequently prepare a capillary blood sample remotely. Participants also completed a bespoke usability questionnaire. Of 84 participants recruited, 62 returned capillary samples with 41 having a paired venous sample for Hb HbA1c analysis. Hb HbA1c results using both collection techniques demonstrated good agreement; Passing-Bablok Regression analysis, y = 0.4 + 1x; R = 0.986, Bland–Altman Difference Plot providing mean difference of 0.3 mmol/mol. Over half of participants found the MiniCollect® tube easy to use. The majority were in favour of the remote capillary blood collection service and would use it if routinely available. Remote collection of capillary blood for Hb HbA1c, is a valuable and convenient alternative for people with diabetes living and working in rural or urban settings ensuring optimal continuity of care. Authors have no conflicts of interest to declare.

P94 Comparison of the 75 g postnatal oral glucose tolerance test (PNOGTT) and screening with fasting plasma glucose (FPG) and HBA1c in women with gestational diabetes mellitus (GDM)

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The best method to assess postnatal glycaemic status in women who have had gestational diabetes mellitus (GDM) remains uncertain as the ADA and NICE guideline recommendations differ. ADA advises PNOGTT as a diagnostic test post GDM. NICE advises a screening FPG and HbA1c and doesn’t advise a follow up diagnostic test with PNOGTT. In Ireland, PNOGTT has been widely used. During the COVID-19 pandemic, FPG combined with Hba1c (FPG/HbA1c) replaced PNOGTT in the Coombe Hospital. Those with an abnormal result (FPG ≥ 5.6 mmol/l or HbA1c ≥ 40 mmol/mol) were offered a PNOGTT. We compared results for both methods. 796 women with GDM were included. 376 had FPG/HbA1c screening with 121/376 (32%) having an abnormal result (115/121 prediabetes and 6/121 T2DM). Of the 121 subjects offered PNOGTT, 98/121 (82%) attended. 70/98 (68%) had a normal PNOGTT. In the 28/98 with abnormal PNOGTT, 25/98 (22%) had prediabetes and 3/98 (3%) had T2DM. 420 women attended for PNOGTT-based testing. Of these, 44/420 (10.5%) were abnormal with 42/44 having prediabetes and 2/44 T2DM. Postnatal screening with FPG/HbA1c compared to PNOGTT identified higher rates of prediabetes and T2DM (p < 0.001). However, over two-thirds with abnormal FPG/HbA1c who proceeded to PNOGTT had a normal glycaemic tolerance. This would suggest that screening with FPG/HbA1c does not accurately identify subjects with prediabetes and T2DM and that a PNOGTT should be performed on all women with a history of GDM.

P95 Female sexual dysfunction in type 1 diabetes

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Female sexual dysfunction (FSD) is a well-recognised but under-researched complication of diabetes and is associated with negative psychological and social outcomes. We aimed to investigate the prevalence of FSD in patients with type-1 diabetes attending our outpatient clinic. Thirty-eight patients were asked to complete an anonymous questionnaire evaluating general and diabetes-related health, and evaluating sexual function using the Female Sexual Function Index (FSFI). FSFI assesses sexual function across six domains with a maximum score of 36 indicating no self-reported sexual dysfunction, and a score below 26.55 deemed to indicate FSD. 34% (13/38) completed the questionnaire, 15.8% (6/38) formally declined to participate, and 50% (19/38) did not return the questionnaire. Median age of respondents was 50 years (IQR 35 – 58), with no significant difference (p=0.74) in response rate between patients less than or over 50.23% of respondents (3/13) reported complications of diabetes; 61.5% (8/13) believe diabetes interrupts their personal life; 46% (6/13) have experienced hypoglycaemia unawareness. Median HbA1c was 66 mmol/mol [IQR 60.5 – 73.5, range 49 – 88]. Median FSFI score was 17.3 (IQR 1.95 – 30.95, range 1.2 – 32.9). 61.5% (8/13) of respondents had evidence of FSD based on the FSFI, indicating a high prevalence of FSD in this cohort. The low response rate to our survey may indicate a reluctance to discuss issues related to sexual health, even in the setting of an anonymous questionnaire. Further studies are required to determine risk factors for FSD in our patients, and to explore potential interventions.
testing was undertaken in 212 adults (>16 years). Antibody testing was conducted at an accredited UK laboratory, with all patients having a triple antibody panel (anti-GAD65, anti-IA2 and anti-ZnT8). The median (range) age of those tested was 50 (16–88) years. Prevalence of antibody positivity in this cohort was 20.4% (n = 43); (55.8%) demonstrated positivity in a single antibody, while 23.3% and 20.9% had two and three positive antibodies respectively. Interestingly, the median (range) age of patients was lowest in the triple antibody positive cohort, at 36 (20–82) years. The prevalence of antibody positivity in those aged 16–30 was significantly greater than those >30 years (55% vs 16.8%). Anti-GAD65 antibody was most frequently positive followed by anti-ZnT8 and anti-IA2. Diabetes autoantibody testing is utilised widely within the hospital group. Patterns of antibody positivity in this audit are consistent with previously published observations. Further study is required to determine if antibody status correlates with varying clinical phenotypes, which will inform local policy on the clinical use of diabetes autoantibodies.

P98 Evaluating the early impact of dexcom G6 CGM in patients with type 1 diabetes attending a rural diabetes service

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Dexcom G6 ® CGM (Dexcom, San Diego, USA) has recently been introduced at our type 1 diabetes clinic, as an adjunct to improve glycaemic control [1]. To assess its early impact, all clinic patients were identified who had been using Dexcom G6 for at least 3 months. Data were recorded from each patient’s Dexcom CLARITY profile, summarising the first 2 weeks of sensor use, and the most recent 2 weeks of sensor use. Where available, pre-CGM and recent HbA1c were also recorded. The Wilcoxon Matched-Pairs Signed-Rank Test was used to assess for significant differences in glycaemic control.

From data obtained from 28 patients were analysed, with median age 43.5 years (interquartile range 34.5–51.8). The median duration of diabetes was 17 (10.75–29.0) years, and median duration of CGM use was 6 (6–8) months. 38% were female, and 64% had previously received structured diabetes education. Median Time-In-Range did not significantly change during the study period (44.5% vs. 43%; p=0.22). Median sensor glucose did not significantly improve (10.4 mmol/L vs. 10.9 mmol/L; p=0.21). There were no significant improvements in glycaemic variability. Time in the low/very low range was on average < 1% at baseline, and did not significantly change with CGM. Sixteen patients had HbA1c data available, and their median HbA1c did not significantly improve with CGM (72.5 mmol/mol vs. 63 mmol/mol; p=0.099).

In conclusion, Dexcom G6 CGM has not had a significant early impact on the glycaemic control of a small group of patients with type 1 diabetes attending our clinic. Reference: [1] Beck RW, Riddlesworth T, Ruedy K, Ahmann A, Bergenstal R, Haller S, Kollman C, Kruger D, McGill JB, Polonsky W, Toschi E. Effect of continuous glucose monitoring on glycemic control in adults with type 1 diabetes using insulin injections: the DIAMOND randomized clinical trial. Jama. 2017 Jan 24;317(4):371–8.

Authors have no conflicts of interest to declare.

P99 Visit-to-visit HbA1c variability as a risk factor for retinopathy and microalbuminuria in patients with diabetes

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HbA1c variability has been identified as a risk factor for diabetes complications. We investigated the association between HbA1c and its variability and retinopathy and microalbuminuria in a retrospective study of 1102 patients whose retinal screening results returned consecutively and who had at least four HbA1c measurements recorded prior to screening, over up to 10 years. Of these, 920 patients (83.5%) had type-2 diabetes, 136 (12.3%) had type-1 and 46 (4.2%) had another/unknown type of diabetes. Included were 705 patients (63.97%) without retinopathy (R0), 302 (27.4%) with background retinopathy (R1), and 25 (2.26%) with either pre-proliferative (R2) or proliferative retinopathy (R3, grouped together). Microalbuminuria was present in 370 patients (33.6%). Individuals with retinopathy had higher mean HbA1c than those without (64.4 mmol/mol ± 14.1 vs 54.8 ± 10.9, p < 0.001) and those with R2/R3 had higher HbA1c than those with R1 (74.5 ± 18.3 vs 63.7 ± 13.5). In those with retinopathy, the average standard deviation of the HbA1c (SD), as a marker of variability, was greater than in those without retinopathy (10.22 vs 8.38, p < 0.001). Mean A1c (67.9 vs 60.5) and SD of the A1c (11.1 vs 9.0) were significantly higher in those with maculopathy than those without. Patients with microalbuminuria had higher mean A1c (60.5 vs 57.1) than those without microalbuminuria (p < 0.001) and there was a trend for greater variability in the A1c between these groups (9.7 vs 8.8, p = 0.064). These preliminary data suggest that HbA1c variability, in addition to HbA1c, should be considered as a risk factor for diabetes complications.

P100 Benefits of a dedicated rapid access foot clinic; effects on glycaemic control and non-healing foot ulceration

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Diabetic foot disease leads to deformity, ulceration and increased susceptibility to infection. Complications are prone to rapid progression, tissue loss and increased risk of amputation. The role of tightening glycaemic control in healing ulceration is unclear; however, studies suggest higher HbA1c is associated with increased amputation risk in patients with foot ulceration. We set up a new consultant and senior podiatrist led clinic for patients with non-healing ulceration (ulceration > 6 weeks in absence of osteomyelitis) and suboptimal glycaemic control (HbA1c > 58 mmol/mol). The pilot was an effort to reduce HbA1c and, in turn, assist in wound healing. Within the four month period, 12 diabetic patients (M:F=11:1; mean age 60 years (43–75); four type 1, eight type 2) agreed to engage in the pilot. Nine previously were under care of diabetologist, two referred from primary care, one diagnosed at ulcer presentation. Baseline HbA1c was 87 mmol/mol and ulcer diameter 0.9 mm. Participants were reviewed at least monthly by both Consultant Diabetologist and Specialist Hospital Podiatrist. Oral therapy and/or insulin were intensified in all. Early preliminary data show a reduction in HbA1c of 17 mmol/mol (p < 0.05). There has been complete ulcer remission in nine patients (baseline SINBAD ≥3) and size reduction of 61% in the remainder (p < 0.05). We have shown that a dedicated Rapid Access Foot Clinic with regular senior review for treatment intensification and improvement in HbA1c, alongside senior podiatry input, has led to better outcomes in diabetic patients with non-healing ulceration. This is a small pilot but already early results show great promise.
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Around 10% of patients with diabetes develop foot ulceration. Approximately, £1 in £150 of NHS funds is spent on foot ulcers or amputations yearly in a setting of unprecedented demands. Prior to 2018, we did not have formalised referral pathways or multidisciplinary approach. Those with diabetic foot disease and osteomyelitis required hospital admission. As part of the Regional Integrated Foot Care Pathway, we established a Trust-Based EFPT to improve service and reduce hospital admissions. This was coordinated by hospital podiatry team working alongside community colleagues. Referral source was broad (emergency departments, primary care, foot protection teams, self-referral) and specialty input immediate. Hospital admission was avoided using Outpatient Parenteral Antibiotic Therapy (OPAT) team supervised by podiatrist, microbiologist and diabetologist. This was further enhanced by a fourth tier, the Regional Multidisciplinary Foot Team (MDFT). We reviewed the service over 6 months; 127 patients were reviewed by EFPT. Emergency Department (ED) attendance was avoided in 50 patients by direct referral. Of the 32 patients who did present to ED and in whom admission would ordinarily have been required, 56% were discharged onto the pathway. Sixteen patients who required tertiary input went straight to the Regional MDF without delay. The OPAT service took 31 patients directly under their care. There have been 113 admissions to the Ulster Hospital avoided since initiation of EFPT and the Regional MDFT. We have saved 1130 bed days. In conclusion, we have developed a much needed and effective EFPT and, collaboratively with Regional MDFT, have greatly improved patient care.

P102 Maintaining a “hypo box” in the hospital setting

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Hypoglycaemia among hospitalised patients with diabetes mellitus occurs at a rate of 12–18%, leading to prolonged hospital stays and increased morbidity. The hypo box is a portable kit that contains all the first-line treatments for managing hypoglycaemia, it was employed at our institution in 2015. To determine compliance with hypo box maintenance, 26 wards were included in the audit. Data was collected on the contents of hypo boxes to assess compliance with local hypoglycaemia guidelines. Interviews were conducted with staff members to ascertain their knowledge regarding the presence, location and maintenance of the hypo box.96% (25/26) of wards had a hypo box and surveyed staff on all of the wards were aware of its presence and location. 24% (6/25) of the hypo boxes were fully stocked in line with local guidelines. The remaining 19 hypo boxes were missing stock items (missing 1 item = 6/25, missing 2 items = 4/25, missing 3 items = 1/25 and missing > 3 items = 8/25). The most frequently missing item was the hypoglycaemia management algorithm. Uncertainty existed as to who was responsible for maintaining stock on > 50% of wards in addition to considerable variability in the frequency with which hypo boxes were checked. Hypoglycaemia audit forms were not completed routinely. To conclude hypoglycaemia is an unexpected event, maintaining a hypo box facilitates prompt management of this emergency. Inconsistency in relation to responsibility and frequency of hypo box checks likely contributes to our findings, efforts are required to address these deficits.

P103 A retrospective study evaluating the association between vitamin B12 levels and gestational diabetes mellitus

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While some risk factors for gestational diabetes mellitus (GDM) are well established, other risk factors and potential associations have only recently been discovered. One such association is that between vitamin B12 insufficiency and the subsequent development of GDM. As GDM can have serious health implications for both mother and child, as well as the burden that an increased prevalence of GDM places on the health systems of the world, it is of the utmost importance that any potential risk factors and associations for the condition be identified and addressed, especially modifiable ones such as vitamin B12. A retrospective study of 178 women with a diagnosis of GDM was conducted. The data was gathered from a database of women with GDM who received their obstetric care in Cork University Maternity Hospital (CUMH) between the years 2014–2020. B12 levels in the study group ranged from 50-1500 ng/L with an overall mean value of 209.71 ng/L. 33% had insufficient B12 levels (when defined as below 150 ng/L). Using multiple linear regression analysis, a statistically significant relationship was detected between average B12 levels and both non-Caucasian race (p = 0.027) and parity (p = 0.028). There was no relationship however between average B12 levels and age, BMI, gestational age at diagnosis, smoking, family history of T2DM and fasting blood glucose levels. The prevalence of vitamin B12 deficiency amongst pregnant women with GDM in this study is high and is significantly higher than levels amongst pregnant women without GDM, and the wider population. Further study is required to determine the causes of same.

P104 The outcomes of diabetic foot osteomyelitis treated by outpatient parenteral antimicrobial therapy (OPAT) in a tertiary centre during a two-year-period

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Diabetic foot osteomyelitis (DFOM) is one of the major complications of diabetic foot ulcers and one of the leading causes of amputation. DFOM treatment usually requires a longer hospital stay carrying a heavy burden on patients, their families and healthcare facilities. This study reviewed the characteristics and outcomes of OPAT-treated DFOM cases during the period from January 2017 through December 2019 in a tertiary hospital using multidisciplinary team approach. The data were obtained from a prospectively maintained database for patients receiving OPAT and further details were collected from the diabetes electronic medical records system Cellma, laboratory and radiology systems. Out of 149 episodes of treatment 119 cases meeting the inclusion criteria were included. Of the 119 cases, 103 (86.5%) were males, mean age of 67 years, 97 cases (81.5%) have type 2 diabetes (mean disease duration of 15.8 years), 19 patients (16%) have type 1 diabetes (mean duration 29.2 years). The mean HbA1c at the time of infection was 66.1 mmol/mol. The most common underlying aetiologies were neuropathic (n = 49;41.2%), neuro-ischaeic (n = 38;31.9%) and ischaemic ulcers (n = 28;23.5%) with healing rates of 49%, 44.7% and 35.7% respectively. Antimicrobial therapy was well-tolerated in 90% of cases. The average length of inpatient stay (ALOS) was 14.6 days. In 11 cases admission was avoided and OPAT was organised through outpatients. The total bed days saved was 2092 with the estimated cost savings for the two-year-period are €1,767,740.
In conclusion, implementing OPAT pathway for DFOM helps reducing ALOS, treatment costs and improves the patients’ quality of life.

P105 Assessing oral health and awareness among persons with diabetes mellitus

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Periodontal disease (PD), a progressive inflammatory disease that can lead to tooth loss and negatively impact systemic health, has a bidirectional relationship with Diabetes Mellitus (DM), in which each condition can negatively influence the other. This study sought to determine the oral health status, self-reported oral hygiene habits and awareness of oral health importance in diabetes management amongst people with Diabetes (PWD). Data collection methods comprised across-sectional, self-reported survey distributed online amongst PWD in the United Kingdom and Republic of Ireland, and a peri-odontal examination of PWD attending an Irish hospital. Online survey responses were collected from 77 participants; 74.4% [58/77] and 21.8% [17/77] had types 1 (T1DM) and 2 (T2DM), respectively, with 3.8% [3/77] other. Of the 77 respondents, 38 (49.4%) lived in the UK and 39 (50.6%) lived in Ireland. According to the survey data, 54/77 (93.1%) and 10/77 (58.8%) of people with T1DM and T2DM had ≥20 natural teeth, respectively (P = 0.05). Periodontal examination of 56 patients with T2DM attending an Irish hospital revealed that only 23/56 (41%) had ≥20 natural teeth remaining. Oral hygiene routines (defined as twice daily toothbrushing and daily interdental cleaning) were sub-optimal amongst 23/77 (29%) participants surveyed and amongst 28/56 (50%) participants who underwent oral examination. Survey respondents were predominantly unaware of the link between oral health and diabetes management (63/77, 81%). Awareness of oral health importance for diabetes care was low, oral hygiene routines were suboptimal and oral health was predominantly poor amongst the PWD investigated.

P106 Closing the implementation gap – Integrating the D1 now agenda setting tool into routine clinic practice for young adults with type 1 diabetes in Ireland

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Young adults living with type 1 diabetes often disengage with diabetes services, with the disease focused nature of the consultation being a contributory factor to this. Building on our learning from the D1 Now pilot study,1 we aimed to incorporate an agenda setting tool into routine clinic practice and thereby establish a more young person-centred approach to care delivery. This quality improvement project incorporated a user-centred design and included a number of phases of key stakeholder consultations to further refine the agenda setting tool and address additional support needs before roll-out. A qualitative study was embedded within the project to support the evaluation. Semi-structured interviews were conducted with diabetes staff to capture feedback on their experience of using the agenda setting tool. Analysis of interview data identified a number of perceived supports and potential barriers to sustaining the roll out of the agenda setting tool in routine clinic practice. Whole team ‘buy-in’, facilitating person-centred care as well as access to psychological-based support were generated as key themes. While the introduction of the agenda setting tool represented a change in usual clinic practice, overall this appeared to be welcomed by those involved and was regarded as a positive step towards the provision of a more person-centred approach to diabetes care for young adults. An extended period of roll-out is needed to ascertain the long-term sustainability of the agenda setting tool in routine clinic practice. Reference: Casey, B., Byrne, M., Casey, D., Gillespie, P., Hobbins, A., Newell, J., Morrissey, E., & Dinneen, S. F. (2020). Improving Outcomes Among Young Adults with type I diabetes: The D1 Now Randomized Pilot Study Protocol. Diabetic Medicine, 37, 1590–1604. https://doi.org/10.1111/dme.14337

P107 Obesity and COVID-19 severity-revisiting the popkin study one year on: A systematic re-review and meta-analyses

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COVID-19 has infected over 231 million people and caused 4.74 million deaths worldwide. Identifying risk factors which predispose individuals to COVID-19 infection or more severe symptoms is imperative. A highly cited systematic review and meta-analysis by Popkin et al. in 2020 stated that individuals with obesity were at a higher risk of a range of adverse COVID-19 outcomes, including being more likely to develop COVID-19. However, several technical requirements for robust meta-analyses were omitted from this study. We sought to reanalyse the same 73 studies that Popkins included in their analysis. All studies underwent data extraction and quality assessment before they were collated for data synthesis. Five separate outcomes were meta-analysed: risk of testing positive, hospitalisation, intensive care unit (ICU) admission, invasive mechanical ventilation (IMV) requirement and death. For each of the five meta-analyses, heterogeneity tests, forest and funnel plots were performed. We used GRADE to evaluate the level of certainty. Data from 3,106,610 patients were included. All five meta-analyses showed a statistically significant association between obesity and worse COVID-19 outcomes. The highest odds ratios were seen for the association between obesity and COVID-19 hospitalisation (2.10 [1.70, 2.58]). These analyses scored high levels of certainty and low risk of bias. However, the associations between obesity and COVID-19 incidence and mortality showed considerable risk of bias. These analyses suggest that the inferences about obesity increasing risk of hospitalisation, ventilation and ICU admission are sound but also that apparent associations between obesity and likelihood of developing COVID-19 or dying from it warrant further scrutiny.

P108 Glucagon like peptide-1 analogue therapy restores natural killer cell metabolism and cytokine production in people with obesity

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Obesity is associated with significant defects in Natural killer (NK) cells, including lower circulating frequencies, a reduced ability to kill target cells and a deceased capacity to produce cytokines. This
P109 Weight bias among Ireland's next generation of general practitioners

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Weight bias and stigma are pervasive barriers to the effective management of obesity which is a worldwide epidemic. Prevalence amongst all healthcare professionals, but particularly General Practitioners (GP), results in treatment avoidance and poor-quality care. We sought to explore the prevalence of weight bias amongst current Irish GP trainees. An online anonymous survey was emailed to all GP trainees. This included a weight bias questionnaire comprised of three scales incorporating the “Universal Measure of Bias-Fat”. The mean responses were calculated. Frequency of bias was analysed using Spearman Rank Correlation and a t-test. Associations of bias with gender, age, year of training and work location were assessed with linear regression. Mean scores demonstrated a highly statistically significant lack of bias $p<0.001$. However, between 6 and 25% of trainees had persistently biased responses. Female trainee responses were less biased than males, $P=0.03$. Participants in later training years ($P=0.006$) and those based in primary care ($P=0.02$) appeared to have lower levels of bias. Overall, referral rates to secondary care were low. This study is the first to examine weight bias prevalence quantitatively in a nationally representative cohort of GP trainees. The results are consistent with those from international studies. Based on referral awareness and rates, implicit stigmatising behaviours could be more prevalent than the explicit bias results imply. Further work is needed to understand how bias and stigma influence access to and quality of care for people with obesity in Ireland.

P110 Prevalence of stigma and bias against people with obesity among staff at an Irish university teaching hospital

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Stigma and bias against people with obesity has been shown to be highly prevalent in healthcare professionals, but attitudes and beliefs in Irish hospital staff have not previously been studied. We sought to determine the prevalence of stigma and bias in a cohort of hospital-based healthcare professionals in the West of Ireland. We conducted a prospective cohort study of all healthcare professionals employed at Galway University Hospitals. Staff were emailed and invited to participate in an online survey incorporating a validated “Fat Phobia Scale”. This consisted of 14 pairs of opposing adjectives to describe patients with obesity, on a Likert scale ranging from 1 to 5. Information on participant age, sex, and role was also recorded. STROBE guidelines were adhered to throughout. In total, 310 staff responded and 309 (including 131 doctors and 154 nurses) of those agreed to participate and completed the online survey after consent was obtained. Mean duration of employment was $13.3 \pm 10.7$ years and 71.4% were female. In 12 out of the 14 domains assessed, we found evidence of high levels of stigma and bias, with Likert scores $>2.5$. Results were similar across professional groups, duration of service and sex. The results from this survey suggest that bias and stigma against people with obesity are present in a hospital-based cohort of Irish healthcare professionals. This may have implications for the care of bariatric patients, in terms of dignity, quality of care and adequate access to care.

P111 The world health organization-five wellbeing index (WHO-5) does not predict weight loss in patients having bariatric surgery

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The WHO-5 score is a screening tool to evaluate patients’ current mental wellbeing and can be used before bariatric surgery. All patients are reviewed by a psychologist and screened with WHO-5 before bariatric surgery. Body weight is recorded before and one year after surgery. Forty-five out of 71 patients had a completed WHO-5 and 48 out of 71 patients had pre-op and 12-month post-op weight loss data recorded. All patients who had WHO-5 data collected also had pre- and post-op weight data available. Data analysis was carried out with IBM SPSS Statistics software (version 27) to determine the correlation between percentage weight loss and World Health Organization-Five Wellbeing Index (WHO-5) in patients having bariatric surgery. The mean and SD pre-op weight was 133.6 $\pm$ 25.0 kg and mean weight loss after one year was 40.1 $\pm$ 12.7 kg (30.0 $\pm$ 8.3%). The WHO-5 Wellbeing Index score before surgery was 56.5 $\pm$ 16.8, but we found no correlation between the pre-operative WHO-5 score and weight loss at 1 year ($R^2=0.032$ $p=0.83$). In conclusion, WHO-5 was helpful to identify patients who needed additional psychological support before bariatric surgery but it did not predict weight loss after surgery. Bariatric surgery remains a very good treatment for the disease of obesity and with appropriate multidisciplinary supports, patients with a low WHO-5 score, including those in the depressive range, need not be excluded from having surgery.

P112 The ketogenic diet for the primary and secondary prevention of cardiovascular diseases

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Cardiovascular diseases (CVD) are leading global health problems. Randomized controlled trials (RCTs) indicate that ketogenic diet is inversely related to the risk of CVD, despite the expected distortion of lipid profile and levels. Involved mechanisms include protecting vascular endothelial function, regulating lipids metabolism, modulating blood pressure, and attenuating inflammation. In this systematic review and meta-analysis, we aim to assess the effectiveness of adopting the Ketogenic diet on the primary and secondary prevention of CVD. Our search strategy included RCTs reporting on either patients with established CVD, or on participants with at least one CVD risk factor. Studies were included, whether randomized at the participant or cluster levels. Crossover trials were used for the first exposure period. Searches were restricted to studies reported as full text in the last ten years. A total of 2378 titles and abstracts were screened. 26 full text articles were scrutinized. Five RCTs were included in the meta-analysis, with 298 participants. No studies reported any major cardiovascular events. Adopting Ketogenic diet was associated with a significant reduction in: Triglycerides (MD = -18.16 mg/dl, 95%CI = -25.83,-10.50; p < 0.00001), total Cholesterol (MD = -14.59 mg/dl, 95%CI = -20.32,-8.85; p < 0.00001), low-density lipoproteins (MD = -9.86 mg/dl, 95%CI = -14.54,-5.17; p < 0.0001), systolic blood pressure(MD = -3.91 mm/Hg, 95%CI = -6.00,-1.82; p < 0.0002), diastolic blood pressure(MD = -4.97 mm/Hg, 95%CI = -6.97,-2.98; p < 0.00001), body mass index (MD = -0.88 kg/m², 95%CI = -1.47,-0.29; p < 0.003), and a significant elevation in high density lipoproteins (MD = 3.19 mg/dl, 95%CI = 1.65, 4.74; p < 0.00001). The ketogenic diet has favorable effects on major cardiovascular risk factors. However, further research is warranted to evaluate the long-term implications of the ketogenic diet.

P113 The use of short- and long-range PCR to identify novel LDL-RCNV breakpoints in familial hypercholesterolaemia

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Familial hypercholesterolaemia (FH) is an autosomal dominant disorder causing very elevated LDL Cholesterol levels, which commonly presents to endocrine and diabetes services. FH is primarily due to variants in LDLR and the most cost-effective strategy for identifying this condition is genetic cascade screening in kindreds with an identified proband. Over 10% of FH-causing variants are attributed to copy number variants (CNV’s) in LDLR and MLPA is used to detect these complex rearrangements. However, limitations of this method include the inability to determine the exact breakpoint sequence where deletion/duplication occurs and its expense as a sole cascade screening method within large FH family groups. Thus, characterisation of CNV breakpoints provides insights into FH pathogenesis and can also facilitate development of less complex and more cost-effective cascade-screening assays. A strategy combining both short- and long-range PCR techniques and Sanger sequencing was applied to elucidate the nature and extent of breakpoints in known LDLR CNVs. More specifically, a novel breakpoint in a heterozygous deletion of exon 6 was initially identified using a short-range PCR tiling strategy. Subsequently, this variant was used to validate long-range PCR assays for use in the identification of breakpoints in two multi-exon CNVs—heterozygous deletions of exon 4–6 and exons 15–18. This PCR-based approach revealed breakpoints incorporating Alu sequences in the flanking intronic DNA suggesting an Non-allelic homologous recombination (NAHR) mechanism. The addition of the breakpoint sequences to NGS FH sequencing panels could increase the detection rate of CNVs in the FH patient cohort in a cost-effective manner.

P114 Vitamin D in Ireland 2019–2021: Impacts of living with SARS-CoV-2

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A low vitamin D state has been linked to a greater susceptibility to respiratory conditions and viral infection, including the development of COVID. We have performed an audit of serum 25OHD measures in the Irish population during the 2019–21 COVID pandemic (n = 102,138). The IBM SPSS Statistics Version 28.0 was used. Mean 25OHD concentrations were analysed overall (and specifically in relation to sex and age groups <50 and >50). Measures of 25OHD decreased during the 2.5 year period (p < 0.05). 2021 demonstrated higher means for Quarters 1 and 2 when compared to the previous 2 years (25OHD (nmol/L); means: Q1 = 59, Q2 = 61). The average 25(OH)D level in women remained higher than men (2019: F = 59, M = 53; 2020: F = 63 M = 57; 2021: F = 62, M = 54). Vitamin D mean concentrations have increased annually since 2019, particularly in 2020. This is probably due to lifestyle changes in Ireland because of lockdowns, which might allow more outdoor activity. Alternately there has been a greater consumption of oral vitamin D supplements during the COVID pandemic. Increases in serum Vitamin D measures might partly explain the progressive reduction in symptom load and risk of hospitalisation that has occurred during the third wave of infection. Further audits in 2022 will enable us to fully examine changes in Vitamin D status in Ireland when lockdown has finished.

P115 Population level impact of a prolonged lockdown on metabolic health as indicated by Hba1c levels

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Lockdown protocols, including restrictions on movement and physical distancing, have been intermittently imposed in Ireland as containment measures during the COVID-19 pandemic. We studied the impact of lockdown on population metabolic health via a retrospective observational review of Hba1c results (N = 462,865) requested by general practitioners on adult patients and analysed in University Hospital Galway between January 2018 and June 2021. We also did a more detailed study on a subset (n = 38,044) of this population who had paired Hba1c tests performed 12 months apart. Temporal trends in the difference between paired Hba1c results were studied for 36 months between July 2018 and June 2021. There was no definitive long-term correlation between average Hba1c levels and lockdown periods. However, there was an interesting relationship between the 97.5th centile of Hba1c levels and periods of hard lockdown with the 97.5th centile initially rising, only to be followed by a significant drop. An analysis of the differences between the paired 12-month Hba1c results shows that pre-COVID year-on-year changes were insignificant. After the first lockdown period Hba1c results seemed to rise temporarily. In contrast, as the 2021 lockdown is being eased the data suggests a drop in Hba1c levels relative to pre-COVID. Our evidence suggests that the lockdown strategies used to mitigate transmission of the SARS-CoV-2 virus didn’t have a marked detrimental or beneficial impact on general population Hba1c levels, but there are subtle changes in subsets of the population worthy of further study.
P116 Rising trend in circulating 25-hydroxyvitamin D during the COVID-19 pandemic in Ireland

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Since the onset of the COVID-19 pandemic in 2020, unsubstantiated claims have been made about the need to augment vitamin D intake by supplementation on a population basis in order to prevent SARS-CoV-2 infection and reduce mortality. We conducted a laboratory-based trend analysis of serum 25-hydroxyvitamin D (25OHD) comparing yearly average concentration in the 12 months prior to the pandemic with the first 12 months of the pandemic. In a large sample (n = 100,505), we noted the average yearly 25OHD increased by 2.8 nmol/L (61.4, 95% CI 61.5–61.7 vs 58.6, 95% CI 58.4–58.9, p < 0.001) in combination with a lower percent (12.0% vs 13.4%) of low vitamin D status (25OHD < 30 nmol/L) and a higher percent (2.1% vs 1.7%) of high vitamin D status (25OHD > 125 nmol/L). This yearly increase is almost threefold higher than the yearly increase in average 25OHD based on two similar trend analyses that we conducted between 1993 and 2016, indicating that caution should be exercised about blanket recommendations for vitamin D supplementation in favour of maximising low-dose daily supplementation in at risk groups and clinically vulnerable patients. We advise strongly in favour of targeted supplementation policies.

P117 A core outcome set for the treatment of pregnant women with gestational diabetes: an international consensus study

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P118 Clinical significance of trabecular bone score (TBS) measurement in patients with osteogenesis imperfecta (OI) and X-linked hypophosphatemia (XLH)

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TBS is a bone quality measurement by a DXA software programme to assess bone microarchitecture, currently used to augment bone mineral density and FRAX in fracture risk prediction. The aim of this study was to assess the clinical usefulness of TBS in patients with OI and XLH. Adult patients attending the rare bone disease clinic with OI and XLH between March 2020 to June 2021 with TBS available were included (16 OI; 11 XLH). Pearson’s correlation coefficient (r) and t test were used to analyze results. In patients with OI 5 (31%) had degraded microarchitecture on TBS measurement (< 1.23); there was no correlation between previous/current bisphosphonate therapy and TBS (p = 0.283). There was no relationship between fractures and TBS (p = 0.306). All patients in the XLH group had TBS value > 1.31 consistent with normal bone microarchitecture. There was no correlation between previous therapy (One Alpha/Burosumab) and TBS values in patients with XLH (p = 0.444). TBS measurement confirmed reduced bone quality in patients with OI and normal bone quality in patients with XLH. TBS did not augment fracture prediction in the OI group. Although a small study, the lack of TBS difference between OI patients who received treatment and who did not appears to be true; reflecting treatment bias towards those at risk of fracture (those with lower BMD were more likely to receive treatment and improve TBS to that of untreated patients). Single TBS measurement in XLH patients allows for reduced frequency of DXA scanning for some individuals.

P119 Trimester-Specific-Reference Intervals for commonly requested biochemical and haematological parameters used in pregnancy care

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When reporting laboratory parameters on pregnant women, the reference intervals (RIs) provided should be specific to pregnancy and not the normal adult population. This is because results have different significance depending on the stage (trimester) of pregnancy. The aim of the current study was to establish trimester-specific-RIs in healthy pregnant women. A prospective cross-sectional study of apparently healthy pregnant volunteers was conducted. At enrolment, inclusion criteria were: signed informed consent, age ≥ 18 years, White European, body mass index < 25 kg/m², blood pressure < 140/90 mmHg, non-smoker, no previous or new diagnosis of pathology. Trimester was defined as, T1: up to 13 weeks + 6 days, T2:14-27 weeks + 6 days, T3: > 28-41 weeks + 6 days). Baseline demographics, anthropometric and laboratory measurements were recorded. In total, 31 biochemical and 10 haematological ISO15189:2012 accredited tests were analysed using the Roche Cobas® and Siemens Advia® 2120i platforms respectively following standard operating procedures. RIs were defined according to the International Federation of Clinical Chemistry (IFCC) recommended method1. Oestrogen healthy pregnant women (n = 1232) were recruited, 953(77.4%) failed the inclusion criteria. The reference population comprised of 279 participants, 124 of whom had bio-banked serum samples in each trimester. At the booking visit, 49.2% (n = 61) of participants were nulliparous, with a median age of 34.4 (18.6–47) years, gestational age of 89 (IQR:84–93) days, BMI of 22.5 (21.0–24.5) kg/m² and mean systolic, diastolic blood pressure of 118 (+11) mmHg and 67 (+9) mmHg respectively. Normative biological intervals established in a healthy pregnant European population for commonly requested biochemical and haematological parameters will be a valuable aid to result interpretation, healthcare and management of pregnant women. Reference: Clinical and Laboratory Standards Institute (CLSI). Defining, Establishing, and Verifying Reference Intervals in the Clinical Laboratory; Approved Guideline—Third Edition CLSI document EP28-A3c (ISBN 1–56,238-682–4), 2008. Authors have no conflicts of interest to declare.
Miscellaneous

P120 Analysis of the karyotypes of a cohort of women with hurner syndrome attending a dedicated specialist clinic

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Classic 45XO genotype accounts for < 50% of all cases of Turner syndrome (TS). Whilst 45XO/46XX mosaicism is generally associated with a milder phenotype, little is known about the phenotype of other variants. Our aim was to investigate the clinical and cytogenetic characteristics of women with TS attending a dedicated specialist clinic. This study analysed a cohort of 41 women with TS where updated karyotyping was available. 39% (16/41) had 45XO, 14.6% (6/41) 45XO/46XX mosaicism, 14.6% (6/41) isochromosome X(q), 12% (5/41) ring X chromosome, 7.3% (3/41) X chromosome deletions, and 4.8% (2/41) mixed gonadal dysgenesis. One patient each had mosaicism with triple X, isodicentric X(p), pseudodicentric chromosome X and one also had monosomy of X(p) at position Xp 11.2 and trisomy for X(q) from Xq 113.3. Median age of diagnosis of the whole cohort was 5 (0–13) years. Since there is limited published data on women with isochromosome X(q), we analysed clinical phenotypes of this group compared to women with classic 45XO TS. Patients with isochromosome X(q) had lower alanine transference levels (ALT) compared with 45XO (mean 33 U/L vs 18 U/L, p = 0.039) and a non-significant trend towards lower weight, BMI, aspartate transference (AST) and triglycerides, known markers of metabolic health. This small cohort suggests women with TS due to isochromosome X(q) may potentially have less deleterious metabolic health. Evaluation of a larger patient cohort is needed to investigate this further as this may guide the frequency of metabolic screening necessary in this cohort.

P121 A cloud-based genetic database for characterisation of missense variants associated with the acute hepatic porphyrias

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The acute hepatic porphyrias (AHPs) are autosomal-dominant genetic disorders that can manifest with acute neurovisceral attacks causing serious morbidity, underpinned by pathological variants in the haem biosynthetic pathway genes HMBS, PPOX and CPOX. Resultant deficiencies in hemoglobin metabolism cause accumulation of heme precursors and toxicity. Our laboratory runs a de facto Irish national diagnostic service for the acute porphyrias, which has enabled the identification of AHP genetic susceptibility in > 90% of Irish kindreds. Access to up-to-date classifications of mutations is a key requirement in reporting on the pathogenicity of genetic variants identified during molecular diagnostic analysis. Therefore, although genetic confirmation is a central requirement for definitive diagnosis of AHP susceptibility, to date there is no genetic variant database available providing comprehensive reference information, including in-silico and functional characterisation of AHP-related genetic variants, to enable this process. Here we describe an in-house genetic reference database for annotation of missense variants in HMBS, PPOX and CPOX. To ensure reproducibility, transparency and accessibility to the broader porphyria community, we employed a backend cloud-native infrastructure for database curation (www.PorphyriaDB.com). The result is a secure and scalable system that can nevertheless be updated by means of a simple spreadsheet or CSV file. It was built on Amazon Web Services (AWS) using an Infrastructure as Code (IaC) approach, enabling future similar genetic databases related to metabolic diseases to be deployed with minimum expense and effort. The database incorporates prediction scoring of variants, based on established prediction tools and meta-predictor algorithms, benchmarked against functionally validated mutations associated with the aetiopathogenesis of AHP.

P122 Prevalence of diagnosed type 2 diabetes in obstructive sleep apnoea syndrome

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Obstructive Sleep Apnoea Syndrome (OSAS) may constitute a risk factor for the development of type 2 diabetes (DM2), independent of obesity and proportional to hypoxia severity. In 2017, the American Diabetes Association recognised OSAS as an important comorbidity in DM2 suggesting the need to screen for OSAS. However, there is no clear guidance in OSAS to screen for diabetes though it is recognised that the prevalence of diabetes in obesity can be as high as 15–30%. We aimed to determine the prevalence of diagnosed diabetes in OSAS patients attending our sleep clinic. Data were collected between September and December 2020; 68 patient charts were randomly selected and reviewed. Microsoft excel was used for data collection and statistical analysis. Of the 68 patients, 49 were male, the average cohort age was 55y and mean BMI was 36 kg/m². Fourteen (11 males) had diagnosed DM2, average age 63y, BMI 34 kg/m² and apnoea hypopnoea index (AHI) 3.2(moderate-severe OSA). The mean HbA1c of the DM2 group was 52 mmol/mol(6.9%), Pearson’s coefficient for comparison between HbA1c and AHI was -0.3 (p = 0.29). Of the diabetes patients, 5 were diet-controlled, 4 were on one glucose lowering drug, 2 were on insulin and the remainder were on a combination of oral-hypoglycemic agents. In conclusion, in this cohort of 68 OSAS patients, we found a prevalence of diagnosed DM2 of 20%, suggesting a higher prevalence than in the general population. These data suggest the need to screen for diabetes in OSAS.

P123 Blood glucose control and corticosteroid therapy in Covid-19 patients during the COVID-19 pandemic: Perspective from a district general hospital

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High-dose corticosteroids reduce mortality in COVID-19 patients requiring oxygen therapy. Whilst reducing mortality from COVID-19, high dose corticosteroids can cause significant hyperglycaemia, in turn increasing morbidity and mortality. ABCD, Diabetes UK, and IBDS produced guidance on corticosteroid therapy and blood glucose control in COVID-19 patients (November 2020). We assessed implementation of this guidance. We included patients that received dexamethasone for COVID-19 during two admission peaks – Oct/Nov 2020 and Jan/Feb
between 2015–19 and 2020 suggest possible sex-specific differences. The divergent trends in vitamin D status between males and females are more prevalent in males, hospital inpatients and nursing home residents.

P124 Sex, sunshine and sample-origin – predictors of emerging spring and summertime vitamin D deficiency trends amongst Irish adults during the Covid-19 lockdown

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Since March 2020, the COVID-19 pandemic has required the introduction of lockdown measures to control its spread. Vitamin D is thought to reduce the risk and severity of SARS-CoV-2 infection, but the impact of lockdown on population vitamin D status in Ireland is unknown. This cross-sectional study compared Spring/Summertime serum 25(OH)D levels in 29,874 patient samples measured in January–September 2015–2019 (n = 25,015 samples) and in January–September 2020 (n = 4,859 samples) at Galway University Hospitals. Age, sex, sample origin (GP-ordered, hospital outpatient, hospital inpatient or nursing home resident) and date of sampling were recorded. Vitamin D deficiency (serum 25(OH)D < 30 nmol/L) occurred in 19.5% of the total sample population. Males had lower serum 25(OH)D concentrations in 2020 than in 2015–2019 (p < 0.001), while females had higher serum 25(OH)D concentrations in 2020 than in 2015–2019 (p = 0.001). Sample origin was an important predictor of vitamin D deficiency, with 25(OH)D < 30 nmol/L in 16.1% of outpatient samples, 24% of inpatient samples, 10.3% of GP-ordered samples and 28.6% of nursing home samples. Binary regression revealed increased likelihood of vitamin D deficiency in males (p < 0.001), patients experiencing lower daily sunshine hours (p < 0.001), inpatients (vs. outpatients or GP patients (both p < 0.001)) and nursing home residents (vs. outpatients (p = 0.013) or GP patients (p < 0.001)). Overall, vitamin D deficiency was more prevalent in males, hospital inpatients and nursing home residents. The divergent trends in vitamin D status between males and females between 2015–19 and 2020 suggest possible sex-specific differences in the effects of lockdown, and of diet and supplementation changes, on vitamin D status.

P125 Using weight vs body surface area to calculate growth hormone dosage in children and adolescents with prader willi syndrome

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P126 Burden of hospital visits and investigations for patients living with rare disease

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There are estimated to be 30 million people living with rare disease in Europe. (1) In this study we assessed the visit and investigation burden for patients and the hospital, for those attending the rare bone disease clinic at SVUH. Data were extracted from electronic records. Summary statistics (median with interquartile range) were analysed using GraphPad. One hundred and one made 159 visits to the rare bone clinic between June 2020 and May 2021. Females represented 63.4% (64/101). Median age was 37 (26 to 50). One hundred and seventeen visits to other services were made by 34.65% (35/101) of patients. Investigation visits were combined with clinic visits for 49.6% and 52.5% (53/101) had telemedicine consultations at least once. A total of 200 investigations were conducted. Median distance travelled was 192 km (43–460) and cost of travel (AA estimates 2019) was €128.29 (€28.73–€307.37) for visits to the rare bone clinic. Including visits to other services, distance travelled increased to 254 km (60–536) and cost of travel was €169.73 (€40.09–€358.16). These patients are of working age requiring them to take time off work each year which may lead to reduced productivity and work opportunities. In addition, the complexity of care places a considerable burden on SVUH resources. The burden of visits could be reduced by combining more clinic and investigation visits, more use of telehealth and use of laboratory services at local hospitals in a hub-and-spoke model. Reference: Graf von der Schulenburg JM, Frank M. Rare is frequent and frequent is costly: rare diseases as a challenge for health care systems. The European Journal of Health Economics. 2015;16(2):113–8.

P127 Twice daily oral administration of blue whiting protein hydrolysate restores streptozotocin-induced distortion of pancreatic islet morphology

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The anti-diabetic potential of Blue Whiting protein hydrolysates (BWPH) has previously been established. As such, BWPH elicit potent DPP-4 inhibition and insulinotropic actions in in vitro settings; largely retained following simulated gastrointestinal digestion, highlighting the potential for oral delivery. Two hydrolysates, namely BW-SPH-A and BW-SPH-C, demonstrated pro-satiating and antihyperglycemic potential respectively, when assessed in acute in vivo settings, thus warranting further chronic investigation. High-fat fed (HFF), obese mice received low-dose STZ (50 mg/kg/bw, on 2 occasions, 1 week apart). Lean (normal diet) and STZ-HFF controls (n = 8) received twice-daily saline, while STZ-HFF treatment groups received BW-SPH-A, BW-SPH-C (100 mg/kg bw) or sitagliptin (50 mg/kg bw) via oral gavage (n = 8) for 21 days. Biochemical and metabolic parameters were assessed at regular intervals. Excised pancreas was fixed in paraformaldehyde, embedded and sectioned for histochemical analysis, or snap-frozen and stored until required for hormone extraction/quantification. STZ elicited declines \((P < 0.001)\) in islet numbers and disrupted islet morphology, with notable increases \((P < 0.001)\) in centrally located alpha cells. BW-SPH-C and sitagliptin improved overall islet morphology \((P < 0.01\) and \(P < 0.05\), respectively), reflected by increased beta- \((P < 0.001)\) and decreased alpha-cell \((P < 0.001)\) areas. While BW-SPH-C elicited greatest weight reduction \((P < 0.05)\), lowest % body fat \((P < 0.05, \text{compared to lean})\) of all HFF mice and improved terminal glucose tolerance, these changes in morphology appear to be largely independent of biochemical changes. Sub-chronic administration of BWPH restores beta-cell mass and islet morphology, largely independent of diabetes status. The comparable success of BWPH to sitagliptin control in this regard adds further credence to the anti-diabetic potential of BWPH, and advocates the identification of bioactive, anti-diabetic peptide components from crude hydrolysates.

P128 The impact of the COVID-19 pandemic on the reproductive health of women with PCOS

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The COVID-19 pandemic has negatively impacted population mental health. Periods of psychological distress can affect women’s reproductive health. Women with Polycystic Ovarian Syndrome (PCOS) are known to have a higher prevalence of mental health disorders. We investigated reproductive and mental health disturbance as a result of the pandemic in women attending our service with a diagnosis of PCOS. An online survey was completed by 94 women in early 2021. It contained items addressing demographics, reproductive health, lifestyle patterns, and mental health symptoms before and during the pandemic. Median age was 31 years (17–47). Mean BMI was 33.6 kg/m\(^2\) (15–56). 37 (39%) noted an overall change in their menstrual cycle over the course of the pandemic. There was no change in the median cycle length (30 days (28–35)) or days of menses (5(4–6)), but there was increased variability in the maximum cycle length recorded \((p = 0.01)\). There was an increase in menorrhagia \((p = 0.009)\) and dysmenorrhoea \((p = 0.001)\), but no increase in missed periods \((p = 0.55)\). 35% said their hirsutism increased and 22% reported a worsening of their acne. There was a mean weight gain of 2.1 kg (SD 7.3 kg). Women reported a worsening in mental health symptoms, including low mood, anxiety and poor sleep. 20% of women reported difficulty accessing healthcare. The COVID-19 pandemic has heightened symptoms of menstrual dysfunction and hyperandrogenism in women with PCOS, in association with weight gain and mental health disturbance.

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