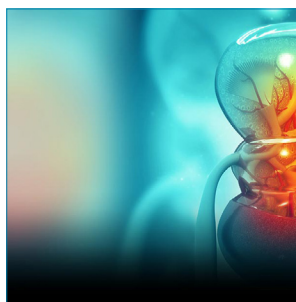# Scientific Tracks & Sessions
August 30, 2022

Diabetes Congress 2022

30th International Conference on

Diabetes and Endocrinology

August 30,2022 | Webinar

Etiology of diabetes | Diabetes types and complications | Insulin Devices and Diabetes Medication

Title: Etiology of diabetes – Current management and what can be planned for the future

Christina Gertrude Yap | Monash University Malaysia | Malaysia

Title: Low prevalence of diabetic retinopathy and visual impairment in a Norwegian diabetic coast population with a high dietary intake of fish oils

Knud Erik Alsbirk | Sotra Eye Clinic | Norway

Title: The beneficial effects of inhibition of hepatic APPL2 on glucose and cholesterol homeostasis

Chen Xi and King-yip Kenneth | The Hong Kong Polytechnic University | Hong Kong

Title: Problems in the diagnosis of follicular thyroid cancer

Bodunova N A | SBHI Moscow Clinical Scientific Center | Russia

Title: A digital health transformation with a humanistic approach by connecting artificial intelligence technology with human health metrics

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Prevention of Diabetes | Etiology of diabetes | Thyroid disorders | Advance Technologies and Tools for Diabetes

Title: Diabetes and Endocrinology

Priyanka Bhattacharya | British Dietetic Association | United Kingdom

Title: Forensic aspects of hypoglycaemia

Derek C Beatty | The University of Edinburgh | Scotland

Etiology of diabetes – Current management and what can be planned for the future

Christina Gertrude Yap[1], Naganathan Kathiresan Pillai[2] and **Nowrozy Kamar Jahan[2]**
[1]Monash University Malaysia, Malaysia
[2]Malaysia Jeffrey Cheah Sch of Med & HS, Malaysia

Diabetes does not discriminate boundaries. It is an epidemic worldwide. At the time diabetes is clinically diagnosed many patients present with diabetes related comorbidities and complications. Relative to the latter, researchers in the past decade explored early biomarkers for diagnosing and monitoring blood glucose and the response of pharmacological treatment in diabetic individuals. Since the dawn of the "OMICS" technology, many researchers reported proteins, metabolites and genes which may be promising candidate early predictors of diabetes and its complications. Lessons leant from fundamental research projects are that various endogenous biomolecules are promising candidates which can be developed as early tests for estimating the risks of developing diabetes and its various complications. A good diagnostic tool should be able to evaluate the risk of diabetes and its complication at an early stage of diabetes onset. Hence, detailed understanding of the pathogenesis of diabetes and its progression to complications allows us to map the biomolecules to the pathophysiology of type 2 diabetes.

Currently, the gold standard marker for diabetic nephropathy is the urinary ACR ratio along with estimated glomerular filtration rate (eGFR). ACR ratio of 30-300mg/g creatinine is labeled as microalbuminuria, indicating that structural damage has occurred in the kidneys. The American Diabetes Association (ADA) recommended that diagnosis of diabetic nephropathy (DN) can be made when at least two out of three measurements of urine ACR examined within 6 months are abnormal. eGFR is another component of renal excretory function which is calculated based on measured serum creatinine. It has been reported that by the time ACR becomes abnormal, eGFR is significantly reduced. Since the common aim in managing diabetes patients is to prevent diabetic nephropathy among all other complications, early risk predictors will be more beneficial compared to markers of kidney damage.

We performed a literature review and highlighted five serum biomolecules which have been evidently described as contributing pivotal roles in the pathophysiology of diabetic nephropathy. MiR-377, miR-99b, CYP2E1, TGF-β1 and periostin are potential candidates for designing an early biomarker array for screening and diagnosis of early stages of diabetic nephropathy. The five shortlisted biomolecules originate from endogenous biochemical processes which are specific to the progressive pathophysiology of DN. pathophysiology of DN is so complex, we hypothesize that a set of biomolecules representing the main pathophysiology pathways can be used to design an early biomarker array panel as a risk predictor for DN.

Recent Publications

1. Challenges Associated with Dengue Vaccine Development. / Jeyapalan, Sharanya; Fernando, Vanisha Naduni; Jahan, Nowrozy Kamar; Yap, Christina Gertrude; Pillai, Naganathan. In: Scientific Research Journal of Clinical and Medical Sciences, Vol. 1, No. 3, 30.11.2021, p. 11-18.

2. Review on Dengue Vaccines over the Years. / Fernando, Vanisha Naduni; Jeyapalan, Sharanya; Jahan, Nowrozy Kamar; Yap, Christina Gertrude; Pillai, Naganathan. In: International Academic Research Journal of Internal Medicine & Public Health, Vol. 2, No. 6, 10.12.2021, p. 11-18.

3. Enrichment protocol for rat models. / Ismail, Teh Rasyidah; Yap, Christina Gertrude; Naidu, Rakesh; Pamidi, Narendra. In: Current Protocols, Vol. 1, No. 6, 06.2021, p. e152.

Speaker Biography

Christina G.Y. obtained her Ph.D. from Monash University in 2012. In her Ph.D. research project, she explored candidates, and early predictors, for diabetic nephropathy. Her hypothetical candidate early predictor for diabetic nephropathy risk is CYP2E1. In her post-doctoral projects, she developed a targeted proteomic approach to quantitate CYP2E1 from human blood samples and assessed the applicability of this analytical method in clinical practice.

Currently, she is a senior lecturer (Metabolic Medicine) at the school of medicine, Monash University Malaysia in Kuala Lumpur Malaysia. She teaches Problem Based Learning (PBL), histology, physiology, and pharmacology in the MD, Bachelor of pharmacy, and the bachelor of human nutrition curriculums.

e: christina.yap@monash.edu

Diabetes and Endocrinology

Low prevalence of diabetic retinopathy and visual impairment in a Norwegian diabetic coast population with a high dietary intake of fish oils

Knud Erik Alsbirk[1], Johan Harald Seland[2] and **Jörg Aßmus[2]**
[1]Sotra Eye Clinic, Norway
[2]Haukeland University Hospital, Norway

Purpose: To present retinal and visual findings in a Norwegian west coast diabetic population and to elucidate the effect of dietary intake of marine polyunsaturated fatty acids (PUFAs) on the development of diabetic retinopathy (DR).

Methods: In an eye practice in an archipelago of 314 km2, serving a population of about 40 000, we recorded the prevalence of visual impairment and DR in a referred diabetic population. 510 consecutive patients were included, 238 females and 272 males. 50 patients had type I and 460 had type II diabetes mellitus (DM). Self-reported medication, diet supplements, HbA1c and fish consumption were registered.

Results: In the type I group, the median age was 44.5 and median DM duration 11.5 years [1–44]. 48% had photographic evidence of DR, 8 patients (16%) had proliferative retinopathy (PDR), and 6 patients (12%) had diabetic macular oedema (DME). All had best-corrected visual acuity (BCVA) of 0.5 (log MAR 0.3) or better in the best eye. In the type II group, the median DM duration was 8 years [1–53], and median age was 66. 98% had best eye BCVA at or better than 0.5 (log MAR 0.3) in the best eye.

Conclusion: None of the 510 patients had BCVA worse than 0.3 (log MAR 0.48) due to diabetic retinopathy. Compared to similar studies, we found a very low visual impairment rate. A possible protective effect of PUFA on the prevalence and progression of diabetic microangiopathy including retinopathy is discussed.

Recent Publications

1. Diabetic retinopathy and visual impairment in a Norwegian diabetic coast population with a high dietary intake of fish oils. An observational study DOI:10.1111/aos.14977 September 2021

2. Prevalence of diabetic retinopathy in Norway: Report from a screening study DOI:10.1111/j.1755-3768.2011.02160.x September 2011

3. Propionibacterium acnes in Eyes of Cataract Patients DOI:10.1016/S0955-3681(13)80371-1 June 1992

Speaker Biography

He is a pensioned doctor. For 25 years he attended hospitals in Denmark, and for 10 years as a chief physician. Last 18 years he worked as an Ophthalmologica practitioner in the Sotra Eye Clinic outside Bergen, Norway, where the study was performed.

e: alsbirk@frisurf.no

The beneficial effects of inhibition of hepatic APPL2 on glucose and cholesterol homeostasis

Chen Xi and **King-yip Kenneth**

The Hong Kong Polytechnic University, Hong Kong

Cardiovascular disease (CVD) is the most prevalent cause of morbidity and mortality in diabetic patients. Hypercholesterolemia, characterized by high low-density lipoprotein cholesterol (LDL-C), raises cardiovascular events in patients with type 2 diabetes (T2D). Although several drugs, such as statin and PCSK9 inhibitor, are available for the treatment of hypercholesterolemia, they exert detrimental effects on glucose metabolism and hence increase the risk of T2D. On the other hand, the drugs used to treat T2D have minimal effect on improving the lipid profile. Therefore, there is an urgent need to develop new treatments those can simultaneously improve glucose and lipid homeostasis. Adaptor protein, phosphotyrosine interacting with PH domain and leucine zipper 2 (APPL2) causes insulin resistance in liver and skeletal muscle via inhibiting insulin and adiponectin actions in animal models. Single-nucleotide polymorphisms in APPL2 gene were associated with LDL-C, non-alcoholic fatty liver disease, and coronary artery disease in humans. The aim of this project is to investigate whether APPL2 antisense oligonucleotide (ASO) can alleviate dietary-induced T2D and hypercholesterolemia.

High-fat diet (HFD) was used to induce obesity, insulin resistance, and dyslipidemia in mice. GalNAc-conjugated APPL2 ASO (GalNAc-APPL2-ASO) was used to selectively silence hepatic APPL2 expression in C57/BL6J mice fed with HFD. After the HFD feeding for 2 weeks, the animals were subjected to weekly subcutaneous injection of GalNAc-APPL2-ASO or GalNAc-Control-ASO for 16 weeks. Glucose, lipid, and energy metabolism were monitored during this treatment period.

Immunoblotting and quantitative PCR analysis showed that GalNAc-APPL2-ASO treatment selectively reduced APPL2 expression in liver instead of other tissues, like adipose tissues, kidney, muscle, and heart. Glucose tolerance test and insulin sensitivity test revealed that GalNAc-APPL2-ASO improved glucose tolerance and insulin sensitivity progressively. Blood chemistry analysis revealed that the mice treated with GalNAc-APPL2-ASO had significantly lower circulating levels of total cholesterol and LDL-cholesterol. Metabolic cage study exhibited GalNAc-APPL2-ASO treatment increased energy expenditure suitably. However, there was no difference in circulating levels of high-density lipoprotein (HDL) cholesterol, triglyceride, and free fatty acid between the mice treated with GalNac-APPL2-ASO and GalNAc-Control-ASO. No obvious effect on food intake, body weight and liver injury markers after GalNAc-APPL2-ASO treatment was found, supporting its tolerability and safety.

We showed that selectively silencing hepatic APPL2 alleviated insulin resistance and hypercholesterolemia, improve energy metabolism in dietary-induced obese mouse model, indicating APPL2 as a novel therapeutic target for metabolic diseases.

Recent Publications

1. Lv, Q.; He, Q.; Wu, Y.; Chen, X.; Ning, Y.; Chen, Y. Investigating the Bioaccessibility and Bioavailability of Cadmium in a Cooked Rice Food Matrix by Using an 11-Day Rapid Caco-2/HT-29 Co-culture Cell Model Combined with an In Vitro Digestion Model. Biol Trace Elem Res 2019, 190 (2), 336-348.

Speaker Biography

She got a master's degree in food science in Mainland China. Currently, she is a Ph.D. student at the department of health technology and informatics, The Hong Kong polytechnic university. Her research area is mechanisms and metabolic pathways of chronic diseases like obesity via metabonomics.

e: xi0420.chen@connect.polyu.hk

Diabetes and Endocrinology

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Problems in the diagnosis of follicular thyroid cancer

Bodunova N A, Feydorov I Y, Tsapkova L A, Nikolaev S E, Osipova (Savinkova) A V, Khatkov I E and **Thazeplova L A**

SBHI Moscow Clinical Scientific Center, Russia

Introduction: According to data from fine needle aspiration biopsy (FNAB), the prevalence of follicular neoplasia constitutes 10-15% among all thyroid nodules. In the vast majority of cases, the type of neoplasms is benign. And only in 1 out of 10-15 cases, follicular neoplasia turns out to be malignant (well-differentiated follicular cancer). Currently, the main method of preoperative differential diagnosis of thyroid nodules is a cytological examination of the material obtained by fine-needle aspiration biopsy. The accuracy of the cytological diagnosis is 80-92%, whereas the frequency of "indeterminate" cytological response can reach 20%.

In order to stratify the results of FNAB, cytological conclusions are ranked according to the international Bethesda System 2017 (TBS) for Reporting Thyroid Cytopathology (TBSRTC). According to this classification, three types of "indeterminate" diagnoses are distinguished: atypia of indeterminate significance/follicular changes of indeterminate significance - category III; follicular neoplasia/suspected follicular neoplasia – category IV; suspected cancer - category V. According to modern protocols for the treatment of thyroid tumors, in case of an indeterminate response, diagnostic surgical intervention - hemithyroidectomy can be recommended, and in the case of category V - thyroidectomy with paratracheal lymph node dissection. Malignancy of the nodule in the final morphological analysis is confirmed in 10–40% of cases after diagnostic hemithyroidectomy in patients with TBSRTC III and IV, while the number of specific complications such as laryngeal paresis or parathyroid insufficiency occurs in 3–10% of cases.

Materials and methods: We analyzed 54 patients (47 women and 7 men) examined at the Moscow Clinical Scientific Center named after A.S. Loginov for thyroid neoplasms in the period from March to July 2022. In this cohort, 17 people women anderwent surgery. The volume of surgical intervention was as followed: 12 hemithyroidectomies, 4 thyroidectomies and 1 thyroidectomy with central cervical lymph node dissection. All patients underwent laboratory and instrumental examinations at the preoperative stage. We analyzed levels of thyroid-stimulating, T3 and T4 hormones, antibodies to thyroid peroxidase (Ab-TPO). Cytological conclusion was drawn up based on the results of ultrasound of the thyroid gland and FNAB.

Results: 1 sample was classified as non-informative (I category TBS), 27 samples - colloid goiter (II category TBS), 17 samples were classified as follicular neoplasia (IV category TBS), 5 and 2 samples as suspicion for malignancy (V category TBS) and malignant tumor (VI category TBS), respectively.

According to the morphological analysis, among patients diagnosed with follicular neoplasia (17 individuals), 6 patients (35%) were diagnosed with malignant thyroid tumor, of which 4 patients were found to have a follicular variant of papillary thyroid cancer, 1 case of follicular thyroid cancer and 1 case of Hurthle cell thyroid carcinoma of the right lobe. 11 patients (65%), were diagnosed with benign neoplasms, of which 7 cases were follicular adenomas of the thyroid and 4 cases were nodular colloid goiter.

Therefore, among operated patients diagnosed with follicular neoplasia, malignancy of the neoplasm was confirmed in 35% of cases, whereas 65% of patients were diagnosed with benign neoplasms.

Conclusions: Accurate preoperative differential diagnosis of thyroid follicular neoplasms is of great clinical interest and determines a precision approach to the choice of surgical tactics.

Conflict of interest: The authors declare no conflict of interest.

Recent Publications

1. Bodunova N, Vorontsova M, Khatkov I, Baranova E, Bykova S, Degterev D, Litvinova M, Bilyalov A, Makarova M, Sagaydak O, Danishevich A. A Unique Observation of a Patient with Vulto-van Silfhout-de Vries Syndrome. Diagnostics. 2022; 12(8):1887.

Speaker Biography

Bodunova N.A. is currently the head of the center for personalized medicine, a gastroenterologist. She graduated from the Moscow Medical Academy named after I.M. Sukhanov with a degree in medical science in 2011. From 2011 to 2013, she completed residency training at the central research institute of gastroenterology. In 2013, she trained at the university hospital of Geneva, Switzerland. Her internship experience include advanced training courses under the guidance of one of the leaders of metabolic surgery in the USA, Kelvin Higa, and then - in California (USA) from the President of the American society of metabolic surgery Ninh Nguyen (2014), and liver diseases at Hadassah hospital, Israel (2014). In 2015, she defended her Ph.D. thesis on "vitamin malabsorption after bariatric surgery". She completed her residency in "Endocrinology" at the Moscow state medical university after A.I. Evdokimov in 2016. She took advanced training in the specialty "Pharmacogenetics and personalized medicine" at the Russia Russian medical academy of postgraduate education n medical academy of postgraduate education (2017). Since 2011, she has been working at the Central Research Institute of Gastroenterology (GBUZ MCSC named after A.S. Loginov MHD). Her area of professional competence is diseases of the intestine, stomach, and biliary system, observation of patients after bariatric operations, development of methods for the prevention of nutritional disorders, correction of vitamin and trace element deficiencies, and treatment of malabsorption syndrome after various surgical interventions. She is the author of more than 90 scientific publications in Russian and foreign publications.

e: n.bodunova@mknc.ru

Notes:

A digital health transformation with a humanistic approach by connecting artificial intelligence technology with human health metrics

Gnaneshwer Jadav

University Hospital Linköping, Sweden

Human intestine consists of trillions of microbiota diversity with the function of nutrient absorption, immune system regulations, and host protection (from pathogenic microbes). Due to the individual's different lifestyle, ethnicity, and genetic background; the immune, mental, and gut microbiota functions differently. Example, Tanzania hunters diet mostly involves high protein and western populations diet is high carbohydrate suggests the clear difference in human body functionality. In addition, rural populations high protein diet, nature connection for pure oxygen, less exposure to pollution and less stressed people's microbiota functions differently than urban population.

Human genome and diet have been changed over the years, there could be an incompatibility between human genome and microbiota. In addition, low diversity of microbiota strongly associated with increased cholesterol, inflammation, triglycerides, fatty acids, white blood cells, insulin resistance, and decreased HDL-cholesterol. Elevations in glucocorticoids (GCs) appear to reduce gut microbiome diversity in experimental studies, suggesting that a loss of microbial diversity may be a negative consequence of increased GCs. However, given that ecological factors like food availability and population density may independently influence both GCs and microbial diversity, understanding how these factors structure the GC-microbiome relationship is crucial to interpreting its significance in wild populations (1).

Melatonin originally defined as a neurohormone secreted by the pineal gland, is synthesized in the retina, platelets, skin, lymphocytes, uterus, and importantly, the gut, in which the amount of melatonin is approximately 400 times greater than that in the pineal gland (2).

The homeostasis of the gut-brain axis has been shown to exert several effects on physiological and psychological health. The gut hormones released by enteroendocrine cells scattered throughout the gastrointestinal tract are important signalling molecules within the gut-brain axis. The interaction between gut microbiota and gut hormones has been greatly appreciated in gut-brain crosstalk. The microbiota plays an essential role in modulating many gut-brain axis-related diseases, ranging from gastrointestinal disorders to psychiatric diseases. Similarly, gut hormones also play pleiotropic and important roles in maintaining health, and are key signals involved in gut-brain axis. More importantly, gut microbiota can affect the release and functions of gut hormones (3).

Recent Publications

1.   Identification of a Novel Serological Marker in Seronegative Rheumatoid Arthritis Using the Peptide Library Approach DOI:10.3389/fimmu.2021.753400

2.   Pathogenesis of immune thrombocytopenia in common variable immunodeficiency DOI:10.1016/j.autrev.2020.102616.

Speaker Biography

He is a pharmacist with an undergraduate degree from India. Biotechnologist with a master's degree from Italy, and immunology and endocrinologist with a Ph.D. from Italy. He has also a year of postdoctoral research experience in Sweden. In addition, he recently completes his MBA graduate from the UK.

With a passion in science and technology, He has started Akeno Health to help pre-diabetes and diabetes type-2 patients to reverse their diabetes and type-1 diabetes patients manage diabetes effectively. He acts as a consultant to several healthcare companies and recently joined as a chief medical officer of Celestial Research Institute (CRI) and a telehealth company. He has over 10 years of experience in science and technology and over 2 years of experience in business development, marketing, strategy, and healthcare entrepreneurship.

e: gnaneshwer.j@akenohealth.com

Diabetes and Endocrinology

Priyanka Bhattacharya

British Dietetic Association, United Kingdom

Diabetes is a metabolic disorder in which either Pancreas does not produce enough insulin or when the body is unable to effectively utilize the Insulin produced which results in high blood sugar levels.

WHAT IS THE ENDOCRINE SYSTEM & HOW DOES IT WORKS?

The endocrine system consists of all glands in your body and those secret hormones. This includes, among others, the pituitary gland in the brain which regulates growth, the ovaries and tastes which control the reproduction and secondary sex characteristics; and the pancreas, which regulates blood sugar and metabolism.

The endocrine system works together with the nervous and immune systems to sense changes in your body's condition and return things to normal. To do this, it releases hormones into the blood steam. Diabetes is two types such as Type-1 and Type-2.

Type -2 diabetes can be reversed by dietary and lifestyle changes.

Simple lifestyle adjustments can go a long way toward lowering the risk of type 2 diabetes, and all it takes is a little self-control and earnest effort.

• Exercise regularly

• Maintain a healthy weight

• Consume healthy low-glycemic foods

• Include whole grains and fiber rich foods in daily diet

• Eat lots of fruits and vegetables

• Control stress

• Avoid alcohol

Healthy foods for controlling Type-2 diabetes: Oats, Beans, Green leafy veg, olive oil, Almonds, Avocados, etc. A superfood for Diabetes is Fenugreek seeds which can help regulate Blood sugar levels and insulin levels.

Ingredients:

1. Fennel seeds- one teaspoon

2. Ajwain seeds – one teaspoon

3. A dash of honey/lemon

4. Methi seeds – one teaspoon

5. A glass of water.

Speaker Biography

She is a clinical dietitian and has done her masters in Dietetics and community nutrition management. She is a member of the British dietetic association. Working as a freelancer dietitian all over the world. She is passionate about educating people regarding the truths and myths of health through the blogs on her Facebook page @ dtpriyankabhattacharya. Her belief in the fact that eating healthily, maintaining a balanced lifestyle, and staying well.

e: priya23781@gmail.com

Forensic aspects of hypoglycaemia

Derek C Beatty
The University of Edinburgh, Edinburgh

Diabetes complications of hypoglycaemia, hypoglycaemia unawareness and neuroglycopenia are often encountered by patients treated with insulin. It is feared by patients and families often leading to emotional and mental scars and can affect lifestyle and confidence. Hypoglycaemia can occur in premature babies, persons with hypopituitarism and Addison's Disease. Low blood glucose can affect athletes and the elderly leading to falls. Cases are individual and often difficult for families, clinicians, lawyers and courts to understand. Temporary mental impairment and PTSD injury may occur requiring counselling to overcome hypoglycaemia. 42 years T1D insulin treatment and personal hypoglycaemia experience following wrong insulin care 1987-94 led the author to research published reports. The first hypoglycaemic event was described by Banting, Best and Macleod at the time of insulin discovery as a treatment for diabetes in 1921/22. This review includes observations from 'Forensic Aspects of Hypoglycaemia' by Prof Vincent Marks, 629 case references, February 2019 and other published papers over many years. Complications affecting stable Blood Glucose levels include Otitis Externa, Osteomyelitis, Neuropathy pain, infection treatment by IV antibiotic delivery, periodontal dental link with gum disease, inflammation, chemical change reducing insulin effectiveness, calcium stones in the saliva duct, sodium, calcium, magnesium electrolyte imbalance, Omega 3 deficiency, night saliva duct cortisol secretion, depression. Use of insulin and C Peptide assay is beneficial in forensic investigations following unexplained death or insulin use as a weapon in alleged criminal matters. Society can learn from this research to provide improved diabetes care for patients to achieve good health and long life despite the daily burden of managing a condition with no cure. A duty of care exists by a witness, partner, friend or colleague to a person in a state of hypoglycaemia to assist and if severe summons paramedic help when the person is unable to help themselves because of temporary mental hypoglycaemia impairment..

Recent Publications

1.   Diabetes and Covid-19 Pandemic - A T1 Patient Perspective – Derek C Beatty ISSN 2639-8109

2.   Forensic Aspects of Hypoglycaemia doi: 10.35248/2155-6156.20.11.e103.

Speaker Biography

Derek Beatty gained his BSc in biological science & business studies, Edinburgh University, 1972, and his diploma in marketing, slough college, 1977. He is a Director of Aston Clinton scientific Ltd since 1997 supplying respiratory nebulisers and specialising in diabetes. He is a healthcare consultant. He recently founded Mobile Med Tech Ltd to offer a mobile diabetes service in Scotland involving NHS Scotland with experience in the team launching Europe's first mobile MRI Service in 1990. He has had T1D for 42 years and overcome diabetic retinopathy.

e: derek.beatty@schillmedical.com