Diabetes, Oral Health & Nutrition:

Inter-relationships, Innovations & Interaction

A certified CME and CDE Symposium

Friday, 15th January 2016
Swissôtel the Stamford
Singapore

Joslin Diabetes Center

SUNSTAR
Sunstar Foundation

Diabetes, Oral Health & Nutrition

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The **Sunstar Foundation** together with the **Joslin Diabetes Center** (Boston, USA) is pleased to welcome you to the **Joslin Sunstar Diabetes Education Initiative (JSDEI)**, focused on the latest cutting-edge research on the Oral Health and Systemic Health.

Diabetes, Oral Health & Nutrition

Welcome Speeches

Prof King George L.

Professor of Medicine, Harvard Medical School
Senior Vice President and Chief Scientific Officer, Director of Research, Joslin Diabetes Center, Boston, MA

Dear Colleagues,

Welcome to the JSDEI Symposium in Singapore. These series of joint meetings between health care providers in Medicine and Dentistry, which have occurred around the globe, have greatly enhanced the understanding on the interactions between whole body and dental health.

For the health care providers in Medicine, this collaboration has increased the awareness on the role of dental and periodontal diseases as a source of chronic inflammation that can accelerate the decline in metabolic control in the diabetic patient. It also increases awareness that coordinated care with our dental colleagues can improve glycemic control which will decrease the risk for the complications of diabetes. We look forward to this joint meeting of medical and dental health care providers in Singapore to learn how this collaboration can be expanded to improve total body health care for people with pre-diabetes and diabetes, especially in Singapore. I look forward to seeing everyone and engaging in an exciting medical and dental exchange.

Best wishes,

George L King, MD
Chief Scientific Officer, Joslin Diabetes Center
Professor of Medicine, Harvard Medical School

Grace Ong

Dean, Faculty of Dentistry, National University of Singapore

Dear Colleagues,

The global burden of chronic diseases is increasing, and in Singapore, our diabetes burden is particularly significant. This multi-disciplinary symposium will bring all the experts- clinicians, scientists and allied health personnel discuss their current work and future strategies to manage the problem of diabetes.

The Faculty of Dentistry, National University of Singapore, with our local partners, is honoured to co-host the Diabetes, Oral Health and Nutrition Symposium with the world-renowned Joslin Diabetes Center and Sunstar Foundation.

I wish all participants an enriching time, exchanging ideas and networking for collaborations so that we can work at new ways and strategies to manage the problem of diabetes.

Best Wishes,

Grace Ong
Dean
Faculty of Dentistry, NUS

Agenda

08h30 Registration

09h00 Opening Address by Guest-of-Honours
A/P Patrick Tseng
Chief Dental Officer
Ministry of Health
Singapore

Mr Haruhisa Takeuchi
Ambassador
Embassay of Japan in Singapore

Symposium I - Diabetes and its Complications
Moderator: A/P Thai Ah Chuan
Associate Professor, Department of Medicine,
National University of Singapore
Senior Consultant Endocrinologist, National University Hospital

09h10 The Epidemiology of Diabetes and its Complications
Speaker: A/P Tai E Shyong
Associate Professor, Department of Medicine, National University of Singapore
Head & Senior Consultant, Division of Endocrinology,
National University Hospital

09h40 Mechanisms of Diabetic Compications:
Role of Insulin Resistance and Hyperglycemia
Speaker: Prof King George L.
Professor of Medicine, Harvard Medical School
Senior Vice President and Chief Scientific Officer, Director of Research,
Joslin Diabetes Center, Boston, MA

10h10 Optimizing Treatment to Prevent Complications
Speaker: A/P Lim Su Chi
Senior Consultant, Diabetes Centre, Khoo Teck Puat Hospital
Clinical Director, Clinical Research Unit, Khoo Teck Puat Hospital

10h40 *Coffee Break*

Agenda

Symposium II - Diabetes and Oral Health
Moderator: Dr Goh Bee Tin
Senior Consultant, Oral and Maxillofacial Surgery,
National Dental Centre Singapore
Deputy Director, Research and Education,
National Dental Centre Singapore
Clinical Senior Lecturer, National University Hospital, Faculty of Dentistry

11h00 Current Understanding of Association Between
Periodontal Disease and Diabetes Mellitus
Speaker: Prof Genco Robert J.
Distinguished Professor of Oral Biology and Microbiology and Immunology
Vice Provost, University at Buffalo Office of Science,
Technology Transfer, and Economic Outreach (STOR)

11h30 Diabetes and Periodontal Disease: The Impact on Oral Health
Care
Speaker: A/P Lim Lum Peng
Associate Professor, Director, Discipline of Periodontics,
National University Hospital, Faculty of Dentistry

12h00 Impact of Oxidative Stress on Susceptibility of Type 2 Diabetic
Patients to Bacterial Infections
Speaker: Dr Tan Kai Soo
Assistant Professor, Discipline of Oral Sciences, National University Hospital,
Faculty of Dentistry

12h30 Navigating the Therapeutic Options for Managing Type 2
Diabetes Mellitus
Speaker: Dr Doddabele Srinivasa Deepak
Senior Consultant, Division of Endocrinology
Department of Medicine, National University Hospital

13h00 *Lunch*

Agenda

Symposium III - Patient's Role in Diabetic Control
Moderator: **Prof Karl Tryggvason**
Professor, Cardiovascular and Metabolic Disorder Program, Duke-NUS
Tanoto Foundation Professor of Diabetes Research

14h00 — Diabetes in Asian Americans
Speaker: Dr Hsu William C.
Assistant Professor of Medicine, Harvard Medical School
Director, Asian Clinic, Joslin Diabetes Center, Boston, MA
Vice President, International Programs, Joslin Diabetes Center

14h30 — Mobile Phone Health Applications for Diabetes Management
Speaker: Dr Bee Yong Mong
Senior Consultant, Department of Endocrinology, Singapore General Hospital
Director, Diabetes Centre, Singapore General Hospital

15h00 — *Coffee Break*

15h20 — Behavioral Economics in Diabetes Management: Activating and Engaging Patients for Better Outcomes
Speaker: A/P Yoong Su-Yin, Joanne
Associate Professor, Saw See Hock, School of Public Health, National University Hospital

15h50 — Diet in the management of Diabetes: Opportunities and Challenges
Speaker: Prof Christiani Jeyakumar Henry
Director of Clinical Nutritional Sciences, Singapore Institute of Clinical Sciences, A*STAR

16h20 — Closing Remarks by Dr Yoshihito Honda
Chairman of Sunstar Foundation

16h30 — End of Seminar

Diabetes, Oral Health & Nutrition

Speakers' Biography and Presentation Summary

A/P Thai Ah Chuan
(Moderator for Symposium I - Diabetes and its Complications)

Associate Professor, Department of Medicine,
National University of Singapore
Senior Consultant Endocrinologist,
National University Hospital

Track Title:
Symposium I - Diabetes and its Complications

Biography:

1975 MBBS University of Singapore
1979 MMed (Int Med) Inversity of Singapore
1984 Member, Academy of Medicine Singapore
1996 FRCP(Edin) United Kingdom

Scientific Profile:

Member, NUH Inpatient Management of Diabetes Programme
Member, Diabetes Mellitus Clinical Practice (CPG) Workgroup, Ministry of Health Medical Advisor, Association of Diabetes Educators, Singapore.
Chair, Core Competency Committee, NUH Senior Residency Prorgramme (Endocrinology, ACGME)
Examiner, a) Final MMed MRCP(UK) Paces Examination;
b) Exit evaluation of specialist trainees in endocrinology, JCST
Mentor and advise department directors and programme leads on
i) Diabetes related clinical services (eg Inpatient diabetes management : APN-lead diabetes in pregnancy service)
ii) Education and training : teaching curriculum and core program for undergraduates , postgraduates and advanced specialist training , competency evaluation
iii) Advanced Nursing in Diabetes - core curriculum and clinical practice

A/P Tai E Shyong

Associate Professor, Department of Medicine,
National University of Singapore
Head & Senior Consultant, Division of Endocrinology,
National University Hospital

Track Title:
The Epidemiology of Diabetes and its Complications

Summary:

Type 2 diabetes is reaching epidemic proportions with large increases in prevalence anticipated over the next several decades in Asia. Three major shifts drive this change: 1) an increase in life expectancy; 2) adoption of urbanized lifestyles; 3) susceptible populations. Asians develop T2D a lower levels of BMI than populations of European ancestry. Insulin resistance differs between different ethnic groups in Singapore. Our work suggests that insulin resistance may result from obesity dependent and obesity independent pathways. These different pathways may differ between ethnic groups. In particular, obesity independent pathways seem to play a greater role in South Asians, whereas obesity dependent pathways may predominate in East Asians. The vascular complications associated with type 2 diabetes also differ between ethnic groups. The reasons for these differences remains unclear. However, these ethnic differences offer opportunities to better dissect the pathogenesis of type 2 diabetes and identify key priorities for treatment in these susceptible complications.

Biography:

A/Prof Tai trained in medicine at the University of Dundee. He subsequently returned to Singapore where he underwent post-graduate training, first in internal medicine, then endocrinology, at the Singapore General Hospital. He is currently head of the Division of Endocrinology at the National University Hospital. In addition to caring for patients with diabetes mellitus and other endocrine disorders, he also works on several committees writing clinical practice guidelines in his discipline. A/Prof Tai's own research concerns the epidemiology of diabetes and associated metabolic diseases. The main goals are to elucidate its causes, distribution and disease burden through large cohort studies including the Singapore prospective study program. He has been involved in many studies designed to elucidate the genetic basis for these disorders in populations of East Asian and South Asian ethnicity. Another key focus is an attempt to understand the ethnic differences in the susceptibility and the manifestations of type 2 diabetes and associated metabolic diseases.

Prof King George L.

Professor of Medicine, Harvard Medical School
Senior Vice President and Chief Scientific Officer,
Director of Research, Joslin Diabetes Center, Boston, MA

Track Title:
Mechanisms of Diabetic Complications: Role of Insulin Resistance and Hyperglycemia

Summary:
Vascular complications of diabetes are the major causes of blindness, kidney failure, heart disease, amputation and cognitive dysfunction in diabetic patients. In addition, the major cost of taking care of diabetic patients is associated with the presence of these complications. New therapies to prevent or stop complications require a thorough molecular understanding of their pathogenesis. Of all of the risk factors that have been identified to increase the risk of micro and macro vascular complications of diabetes, hyperglycemia and insulin resistance are the most specific related to people with diabetes. Recent understanding regarding the mechanisms by which hyperglycemia is causing complications have undergone a shift with a focus not only on hyperglycemia's toxic actions but also with the recognition that there is a need to identify endogenous tissue protective factors that can neutralize the toxic effects of hyperglycemia. For insulin resistance, there is a clear need to understand how insulin's action can be important for the functions of various tissues which belong to the non-traditional insulin sensitive tissues. Insulin's actions in the blood vessels, kidney, heart, eyes and even the central nervous system are now viewed to be important, since insulin resistance in these tissues appears to play an important role in the development of diabetic pathologies in these organs. For this lecture, there will be a detailed description on the understanding of hyperglycemia's effect to induce toxic actions and its interactions with the body's own endogenous protective mechanisms. In addition, insulin's actions and its importance in the blood vessels and heart will be discussed in order to bring a better understanding of how insulin's action can be critical to prevent or stop vascular diseases in diabetic patients. hyperglycemia's effect to induce toxic actions and its interactions with the body's own endogenous protective mechanisms. In addition, insulin's actions and its importance in the blood vessels and heart will be discussed in order to bring a better understanding of how insulin's action can be critical to prevent or stop vascular diseases in diabetic patients.

Biography:
George L. King, M.D., is the Senior Vice President, Chief Scientific Officer, and Head of the Section on Vascular Cell Biology at Joslin Diabetes Center, as well as a Professor of Medicine at Harvard Medical School. Dr. King received his medical degree from Duke University School of Medicine. Dr. King's work focuses on finding the causes of diabetic complications, exploring insulin actions on blood vessels, discovering factors and new treatments for diabetic complications, and understanding the reasons for the high rate of diabetes in Asian Americans. Dr. King has published over 270 articles and reviews.

A/P Lim Su Chi

Senior Consultant, Diabetes Centre, Khoo Teck Puat Hospital
Clinical Director, Clinical Research Unit,
Khoo Teck Puat Hospital

Track Title:
Optimizing Treatment to Prevent Complications

Summary:
Since the advent of insulin, the scald of diabetes is no longer acute hyperglycemic emergencies but its ability to inflict multiple tissues and organs injuries secondary to uncontrolled hyperglycemia. While the complex patho-biology of diabetic complications is only partially unravelled, it is clear that ameliorating hyperglycemia and other vascular risk-burdens, early in the natural history of diabetes is crucial. Nonetheless, patients often present themselves late, given the asymptomatic nature of early diabetes. Moreover, the highly heterogenous trajectories of diabetic complications will call for better patient risk-stratification strategies (e.g. serially measured index of glycemic burden or use of novel biomarkers such as –omics technology). Additionally, in-depth understanding of the molecular mechanisms of diabetic complications may reveal novel therapeutic targets. Along with scientific progress, continual engagement and education of people with diabetes and other stake-holders will be necessary to stem the tides of diabetic complications.

Biography:
Dr. Lim Su Chi is the Senior Consultant, Diabetes Centre at the Khoo Teck Puat Hospital (KTPH). He is also the Clinical Director of Clinical Research Unit, Adjunct Associate Professor at the National University of Singapore (NUS) and Lee Kong Chian
School of Medicine at NTU.

His present research interest includes:
1) Diabetes nephropathy (including genetic epidemiology),
2) Monogenic diabetes,
3) Endothelial function in diabetes mellitus and
4) Metabolic consequence of bariatric surgery

Dr Goh Bee Tin
(Moderator for Symposium II - Diabetes and Oral Health)

Senior Consultant, Oral and Maxillofacial Surgery,
National Dental Centre Singapore
Deputy Director, Research and Education,
National Dental Centre Singapore
Clinical Senior Lecturer, National University Hospital,
Faculty of Dentistry

Track Title:
Symposium II - Diabetes and Oral Health

Biography:
Dr Goh Bee Tin is a Senior Consultant in the Department of Oral and Maxillofacial Surgery (OMS), Research Director and Deputy Director (Research and Education) at the National Dental Centre of Singapore (NDCS). Dr Goh is also Vice- Chair, Research in the SingHealth Duke-NUS Oral Health Academic Clinical Program. Dr. Goh obtained her Bachelor of Dental Surgery from the National University of Singapore (NUS) in 1993. She then went on to specialize in the field of OMS, obtaining her Dental Fellowship with the Edinburgh Royal College of Surgeons in 1996 and Master of Dental Surgery from NUS in 1997. She was admitted as a Fellow of the Academy of Medicine, Singapore in 2000. In that same year, she was sent on a government scholarship for advanced training in cleft lip and palate and orthognathic surgery in Canada. In 2004, she furthered her training in craniofacial implantology in Sweden and the United Kingdom. She obtained a PhD in 2009 from Radboud University Nimegen in the Netherlands for her novel research work on modular endoprosthesis for mandibular reconstruction. She received the Osteopore Innovation Award for her work in clinical tissue engineering and the SingHealth GCEO Outstanding Clinician Researcher Award for her contributions to research at the NDCS. Dr Goh is also appointed Clinical Senior Lecturer at the NUS Dental Faculty and is active in teaching and training postgraduate students. Her research interests include bone tissue engineering and mandibular reconstruction.

Prof Genco Robert J.

Distinguished Professor of Oral Biology and Microbiology and Immunology
Vice Provost, University at Buffalo Office of Science, Technology Transfer, and Economic Outreach (STOR)

Track Title:
Current Understanding of Association Between Periodontal Disease and Diabetes Mellitus

Summary:
The association of periodontal disease is bidirectional. Individuals suffering from diabetes, especially if uncontrolled, are more prone to develop periodontitis. We also know that individuals with both diabetes and periodontal disease are more likely to have poor glycemic control and suffer from greater heart disease and kidney disease than those with diabetes alone.Understanding the role of systemic inflammation associated with both diabetes and periodontitis may help explain these associations. Also recent advances in studying the role of the gut microbiome in diabetes, and the subgingival microbiome in periodontitis provide further insight into the nature of this bidirectional relationship. These investigations into the mechanisms behind the associations have potential to lead to new avenues of prevention and intervention for both diseases.The roles of the dentist and physician, as well as diabetes educators, nutritionists, dental hygienists and other health professionals in co-management of individuals with both diabetes and periodontal disease is becoming increasingly more important. For example, the role of the dentist in management of periodontal disease to aid in glycemic control, and the role of the physician is alerting their patients to the role of periodontal disease will help in better overall management of both diseases.

Biography:
Robert J. Genco, is a State University of New York Distinguished Professor of Oral Biology and Microbiology and Immunology at the State University of New York at Buffalo. He also is Vice Provost and Director of the Office of Science, Technology Transfer, and Economic Outreach at UB. He is a member of the National Academy of Medicine of the National Academy of Sciences and has served on several of its committees commissioned by the U.S. Government to study major health care issues such as Medicare coverage of new clinical advances, and barriers to clinical research. Dr. Genco has received many awards including the American Dental Association (ADA) Gold Medal for Excellence in Research, the ADA Award for Clinical Research, the UB Samuel B. Capen Alumni Award, and the SUNY Research Foundation Lifetime Achievement Award. He also received an honorary doctorate from Georgetown University. He received BS from Canisius College, a DDS, cum laude, from the University at Buffalo, and a PhD in Microbiology and Immunology from the University of Pennsylvania. He also is a Periodontist and treated patients for 35 years. Dr. Genco has published over 350 papers, edited 11 texts, and has been awarded 11 patents. He also was Editor-in-Chief of the Journal of Periodontology from 1996-2006. Dr. Genco has an extensive teaching career acting as mentor to over 80 M.Sc., Ph.D. and postdoctoral students. He taught clinical periodontics, microbiology, and directed the Graduate Program in Periodontology and Oral Biology. Many of his students are leaders in academics, industry and government research activities. Dr. Genco has conducted pioneering studies of the role of infections in increasing the risk for diabetes and cardiovascular disease and stroke. His earlier work established smoking, diabetes mellitus, obesity, low dietary calcium, osteoporosis, and stress as risk factors for periodontal infections. He also has studied tissue engineering as applied to periodontal and implant surgery. He has directed a Clinical Research Center for over 30 years, and has served on 2 FDA panels. Dr. Genco currently serves on the Board of the Buffalo Museum of Science. He also serves on the Boards of the WNY Business Development Fund, and Excell Partners, 2 regional seed capital funds.

A/P Lim Lum Peng

Associate Professor, Director, Discipline of Periodontics,
National University Hospital, Faculty of Dentistry

Track Title:
Diabetes and Periodontal Disease: The Impact on Oral Health Care

Summary:
There has been increasing evidence in the link between oral diseases and systemic conditions. Among the medical related problems, diabetes has emerged as one of the key systemic risk factors based on epidemiological, clinical and biological evidence. The presentation will discuss evidence on the link between diabetes and periodontitis in the local and regional context and the effects of periodontal intervention. Patients with poor glycaemic control are likely to suffer from more severe periodontitis than those with good control which could be partly explained by the accumulation of advanced glycated end products leading to impaired immunological and healing responses. The influence of other co-morbidities will also be discussed. There has been some evidence pointing towards improved glycaemic control with periodontal intervention like scaling and root planing. Diabetes being one of the most common medical problems in Asia calls for greater focus to control periodontitis in patients with diabetes at the national level. This could be controlled through organised community efforts utilizing a collaborative approach involving members of the medical and dental profession together with the patients. It would be ideal to incorporate oral health screening as part of the package in the care of patients with diabetes at Diabetic centres to increase awareness and overall quality of care provided to patients.

Biography:
Dr Lim Lum Peng completed her undergraduate education at the University of Singapore in 1974. Subsequently she obtained her Diploma in dental public health from the Royal College of surgeons (England), MSc in Periodontology at the University of London and PhD from the University of Hong Kong. Dr Lim has varied working experience in community dental services, private practice but for the last 30 years has drifted her focus to academia both at the University of Hong Kong and the National University of Singapore. Her major research interests are in the areas of epidemiology, Periodontal therapy, behavioural science, dental education and oral systemic inter-relationship in diabetes and renal disease. She has conducted research and clinical trials in these fields and has mentored over 20 postgraduate students in research. She has served in several editorial boards over the past 20 years. She is currently Associate Professor in the Faculty of Dentistry, National University of Singapore and Director of Postgraduate residency programme in Periodontology. She serves as Senior Consultant in Periodontics in the National University Health system.

Dr Tan Kai Soo

Assistant Professor, Discipline of Oral Sciences,
National University Hospital, Faculty of Dentistry

Track Title:
Impact of Oxidative Stress on Susceptibility of Type 2 Diabetic Patients to Bacterial Infections

Summary:
Bacterial infections are common amongst type 2 diabetic (T2D) patients where defective innate immune response such as impairment in phagocytosis, respiratory burst and chemotaxis have been postulated to contribute to the patients' susceptibility to bacterial infections. Although hyperglycaemia, advanced glycation products and subclinical chronic inflammatory states induce oxidative stress in the immune cells of T2D; the impact of oxidative stress on innate immune response to bacterial infection is not well appreciated. This presentation will discuss the role of oxidative stress and its impact on susceptibility of T2D patients to bacterial infection, as well as the utility of antioxidant therapy to enhance T2D patients' immune response against infection.

Biography:
Dr Tan Kai Soo is an Assistant Professor at the Faculty of Dentistry, National University of Singapore (NUS). She obtained her PhD in Microbiology from NUS, and completed her post-doctoral fellowship on inflammatory signalling pathways at the School of Dentistry, University of North Carolina, Chapel Hill USA. She subsequently joined the Department of Biochemistry, NUS as a research fellow investigating host innate immune responses of diabetic patients' susceptibility to Burkholderia pseudomallei, a bioweapon and causative agent of melioidosis which is endemic in South East Asia. Currently, she is the principal investigator of the oral microbiology laboratory at the Faculty of Dentistry. Her research areas include host-pathogen interactions in oral infections, oral biofilms, and the impact of periodontal health on chronic systemic inflammatory diseases.

Dr Doddabele Srinivasa Deepak

Senior Consultant, Division of Endocrinology
Department of Medicine, National University Hospital

Track Title:
Navigating the Therapeutic Options for Managing Type 2 Diabetes Mellitus

Summary:
The last few years have seen a profusion of treatment options for type 2 diabetes mellitus (DM). While these options have attempted to target some of the pathyphysiologic mechanisms underlying this chronic condition, it has also resulted in multiple therapeutic choices for patients and physicians to consider. The sheer numbers of possible drug combinations for treating patients with type 2 DM can be confusing to many and may even lead to irrational or potential dangerous polypharmacy. This talk will try to address some of these issues and hopefully educate participants about some of the rational treatment options that can be considered from the choices that are available.

Biography:
Dr Doddabele Deepak, consultant in Endocrinology NUH and a core faculty member of the NUHS Internal Medicine Residency Program since 2010, is the program director of Endocrinology Senior Residency. He qualified from JIPMER, Pondicherry University and subsequently obtained postgraduate training in Endocrinology, Diabetes & Internal Medicine from Liverpool, UK. He also obtained a higher degree of MD from the University of Liverpool for clinical research in the field of growth hormone deficiency in adults. His specialty area of interests includes neuro-endocrinology, adrenal & gonadal disorders and diabetes management in patients on insulin pumps.

Prof Karl Tryggvason
(Moderator for Symposium III - Patient's Role in Diabetic Control)

Professor, Cardiovascular and Metabolic Disorder Program, Duke-NUS
Tanoto Foundation Professor of Diabetes Research

Track Title:
Symposium III - Patient's Role in Diabetic Control

Biography:
Prof Tryggvason has been a Professor in the Department of Medical Biochemistry and Biophysics at Karolinska Institutet in Stockholm since 1994 where he has had a distinguished career. Understanding the role of basement membrane proteins in normal physiology and disease has been a major research interest. In particular, his laboratory has made major contributions in understanding the molecular features of the filtration barrier in the kidney. Through this work, he determined the causes of human kidney diseases such as congenital nephropathy of the Finnish type and Alport's syndrome. Moreover, his findings opened a new and burgeoning field of research around the role of the glomerular epithelial cell or podocyte in human glomerular diseases. Professor Tryggvason's work has also led to understanding the molecular basis of other non-renal basement membrane diseases such as junctional epidermolysis bullosa and congenital muscular dystrophy. More recently, his laboratory has developed methodologies for synthesizing laminins, a family of basement membrane proteins, and has shown that these proteins can be used to control stem cell growth and differentiation. Professor Tryggvason has published more than 380 research articles. He is a member of the Swedish Royal Academy of Sciences, Vice-Chairman of the Nobel Assembly at Karolinska Institutet, and he has received a number of international awards, mainly for his kidney research, including the American Society of Nephrology Homer Smith Award and Louis Jeantet and Anders Jahre awards. Professor Tryggvason is also the founder of four companies, including NephroGenex, Inc. (USA) that has developed a drug for diabetic kidney disease.

Dr Hsu William C.

Assistant Professor of Medicine, Harvard Medical School
Director, Asian Clinic, Joslin Diabetes Center, Boston, MA
Vice President, International Programs,
Joslin Diabetes Center

Track Title:
Diabetes in Asian Americans

Summary:
It's well recognized that Asian descendants develop type 2 diabetes at a lower body weight compared to European descendants. Many Asian countries have developed country-specific guidelines to redefine overweight and obesity suitable for the population. Instead of pinpointing a specific BMI for obesity, the American Diabetes Association has taken an important step in 2015 to publish a position statement along with the annual clinical guidelines, justifying the use of BMI 23 kg/m2 as the new BMI screening cut point to help identify Asian Americans who are at risk for diabetes. This effort led by Joslin together with several key researchers in the field, involved a careful analysis available prospective studies, using only data collected from Asians living in the U.S. to derive a BMI cut point that is deemed generalizable for the diverse Asian American population. It's hoped that this new guideline will be a critical step in educating health care providers about the unique physiology of diabetes in Asian descendants and will encourage more discussions in Asian countries. Subsequently, several publications commented on the new criteria on public health. The recent epidemic of diabetes has fueled the intriguing debate as to the genetic vs. environmental contribution to the sharp rise of diabetes among Asians around the globe in recent years. Many have subscribed to the notion that this epidemic is in part due to the transition from eating traditional Asian diet to Western style diet. We have recently conducted a study that confirmed that traditional Asian diet promotes satiety and improves insulin sensitivity compared to a Western diet. This data, when confirmed in future studies, may further support the "indigenous diet" movement.

Biography:
William C. Hsu, MD is Vice President at Joslin Diabetes Center leading the International Programs to extend Joslin's mission to prevent, treat and cure diabetes. As founder of the International Programs, Dr. Hsu leads a multidisciplinary team to establish culturally relevant diabetes programs, support local needs and objectives, implement sustainable health care delivery model and create innovative, enduring solutions in countries such as Kingdom of Saudi Arabia, United Arab Emirates, Turkey, Japan, China, India, Pakistan, Barbados, Bahamas and the Dominican Republic. As Founder and Medical Director of Joslin's Asian Clinic, Dr. Hsu spearheaded Joslin's efforts to provide ethnically and culturally tailored care for Asian Americans. In that role, Dr. Hsu published key research on diabetes care, and conducted numerous community and national projects that address diabetes awareness and health disparities in this population. Nationally, he served as Chair for the Asian American, Native Hawaiian and Pacific Islander subcommittee, as member on the Adult Strategies Committee, Health Disparities Committee and the Professional Practice Committee (establish national clinical guidelines) for the American Diabetes Association. As a subject expert, he has co-authored national Standards of Care and a policy changing Position Statement for the American Diabetes Association to redefine weight cutpoint for Asian Americans at risk for developing diabetes. More recently, he has focused his research on mobile health, including exploring the use of cloud-based technology to support diabetes management. Dr. Hsu graduated from Cornell University and received his medical degree from Mount Sinai School of Medicine in New York City. He completed his residency training in Primary Care Internal Medicine at Yale School of Medicine and completed his fellowship training in Endocrinology and Metabolism at Harvard Medical School. He is currently an Assistant Professor at Harvard Medical School.

Dr Bee Yong Meng

Senior Consultant, Department of Endocrinology,
Singapore General Hospital
Director, Diabetes Centre,
Singapore General Hospital

Track Title:
Mobile Phone Health Applications for Diabetes Management

Summary:
We are facing a diabetes epidemic. Despite the advancement in diabetes pharmacotherapy, poor self-management skills are leading to serious complications and reduced quality of life among diabetic patients. Recent evidence suggests that mobile phone health applications (apps) may be used as self-management tools to effectively deliver health services while overcoming certain barriers to provider access. A significant potential lies in the ability to be able to capture data real-time and provide decision support. However, the availability of hundreds of such apps makes it difficult to identify those with clinical relevance. The team in Singapore General Hospital and Duke-NUS Graduate Medical School recently conducted a study to explore the feasibility of using an app to guide self-titration of basal insulin in insulin-naïve patients. Key findings from this study will be highlighted. Although the impact of mobile phone health apps on clinical outcomes compared to usual care remains uncertain, there continues to be opportunities for such apps to supplement traditional care. There is also much to be learned about how such technology could be fully exploited.

Biography:
Dr. Bee graduated with M.B.,B.S. from the National University of Singapore in 1998. He completed his training in internal medicine at the Singapore General Hospital (SGH) and obtained his Membership of the Royal College of Physicians (UK) in 2004. Following this, he embarked on his specialist training in Endocrinology at SGH. In 2009, he was awarded the Health Manpower Development Plan (HMDP) fellowship by the Ministry of Health and spent the year at the Joslin Diabetes Centre in Boston under the supervision of Professor Susan Bonner-Weir. He was awarded the National Medical Research Council New Investigator Grant in 2011. Dr. Bee assumed the role of Director, SGH Diabetes Centre in 2011 and subsequently Head, SingHealth Duke-NUS Diabetes Centre in 2015. He is actively involved in post-graduate medical education and was appointed Programme Director of the SingHealth Endocrinology Senior Residency Program in 2012. He was a workgroup member of the Ministry of Health Clinical Practice Guidelines on Diabetes Mellitus as well as the National Steering Committee for Diabetes. He is currently a Senior Consultant in the Department of Endocrinology, SGH and an Adjunct Assistant Professor at the Duke-NUS Graduate Medical School, Singapore.

A/P Yoong Su-Yin, Joanne

Associate Professor, Saw See Hock, School of Public Health,
National University Hospital

Track Title:
Behavioural Economics in Diabetes Management: Activating and Engaging Patients for Better Outcomes

Summary:
Individual behavior and lifestyle choices play a large role in understanding the spread of obesity and type 2 diabetes. Yet at the same time, while the "right" choices are often obvious and well-understood, patients systematically fail to act in their own long-term best interests. Behavioral economists argue that individual capacity for decision making is limited, and many of our choices are not rational but influenced by systematic and predictable biases, such as time-inconsistency and overconfidence. While this has negative implications for patient outcomes, it also suggests that appropriate use of "nudges" (interventions that preserve but influence choice through addressing these biases) may positively and cost-effectively alter behaviour. This presentation will discuss the concepts of behavioural economics, possible applications to support patient activation and engagement in diabetes prevention/screening/management and limitations of these approaches.

Biography:
Joanne Yoong is a Senior Economist at the University of Southern California's Center for Economic and Social Research (CESR), and Associate Professor at the National University of Singapore's Saw Swee Hock School of Public Health. Dr Yoong also holds an honorary Senior Lectureship at the London School of Hygiene and Tropical Medicine, and an adjunct position at the RAND Corporation. She is Deputy Director of the Center for Health Services and Policy Research at the National University Hospital System, Singapore, and the current co-chair of the Singapore Health Economics Association. She has been formerly the director of the RAND Behavioral Finance Forum, and the organising chair of the USC-CSC-NUS 2015 Frontiers of Behavioral Economics Conference. Her work in behavioural economics and finance and health policy has been supported by the World Bank Group, the US National Institutes of Health, the UK Department for International Development, the OECD, the US Department of Labor, the US Social Security Administration and the US Department of the Treasury. Dr Yoong obtained a PhD in Economics from Stanford University and an AB in Economics summa cum laude from Princeton, with a minor in Applied and Computational Mathematics. Prior to attending Stanford, she worked as an analyst at Goldman Sachs in New York and London.

Prof Christiani Jeyakumar Henry

Director of Clinical Nutritional Sciences,
Singapore Institute of Clinical Sciences, A*STAR

Track Title:
Diet in the Management of Diabetes: Opportunities and Challenges

Summary:
Obesity and diabetes are global epidemics. Asia has the unenviable reputation of being the epicenter for type 2 diabetes. Singapore is no exception. There is mounting evidence that body composition and fat patterning plays a significant role in the pathway to metabolic syndrome and diabetes. The existence of an Asian phenotype, coupled with the consumption of high glycemic index (GI) carbohydrate rich foods has been proposed as a contributor to the escalating prevalence of diabetes. Diet plays an important role in our lives. It plays an even more significant role in diabetes and obesity. It is estimated that diabetes and impaired glucose tolerance incidence rates will increase by up to 60% by 2025 compared with 2007 levels. Food Chemists have typically categorized dietary carbohydrates into simple sugars and complex carbohydrates on the basis of their degree of polymerization. However, the effect of Carbohydrate on health may be better categorized according to their physiological effects, notably their ability to raise blood glucose. Carbohydrate foods that increase blood glucose rapidly are called High Glycemic index foods. This concept is now defined as the Glycemic Index (GI). Using Experimental and clinical intervention studies, the presentation will highlight how carbohydrate rich foods can be manipulated to minimize glucose response in the human body. The presentation will also focus on Asian food habits and food pattern involved in precipitating the growing burden of diabetes and obesity. Scientists, clinicians, food manufacturers and consumers would gain great benefit by understanding and selecting low GI foods in their battle to reduce the risk of developing type 2 diabetes and obesity.

Biography:
Professor Jeyakumar Henry is Director, Clinical Nutritional Sciences, at the Singapore Institute for Clinical Sciences. Prof. Henry initially trained as a Food scientist and subsequently obtained his MSc and PhD in Nutrition from the London School of Hygiene and Tropical Medicine. His work on energy metabolism culminated in the development of the "Henry equations" to predict Basal metabolic rate. Professor Henry has served on several committees including UK committee on medical aspects of food and nutrition policy (COMA) panel on Novel Foods, Board member of the UK Food Standards Agency, and member of the general Advisory Committee on Science of the Food standard agency. Prof. Henry was Royal Society visiting professor at the Chinese University of Hong Kong, and continues to be visiting professor at the same university. He is the Editor-in-Chief of the Advances in Food and Nutrition Research, Editorial Board Member of the Nutrition Today, Editor-in-Chief, Clinical Nutrition, Frontier in Nutrition and Scientific Director, ILSI-SEA, International Life Science Institute South East Asia. In 2010 he was awarded the British Nutrition Foundation prize for his outstanding contribution to Nutrition. In 2012, he was made a Fellow of the International Academy of Food Science and Technology for his contribution to melding the sciences of Food and Nutrition.

Periodontitis-Diabetes Cross Referral Guidelines

For Professionals from both the Dental and General Health Care fields

Patient Centric Action

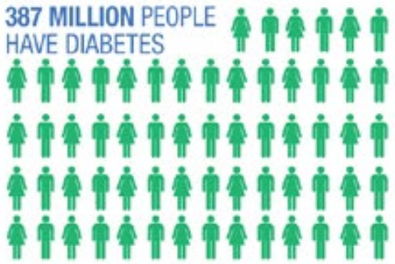
FOR THE DENTAL PROFESSIONAL

Diabetes key points[1,2]

Identifying patients who are at risk of diabetes is a key point to prevent and monitor the development of periodontal disease. Early detection and treatment can significantly reduce the complications of diabetes.

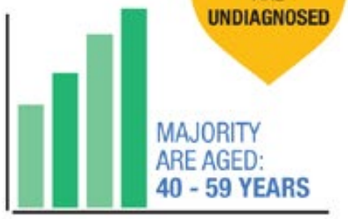
EPIDEMIOLOGY

387 MILLION PEOPLE HAVE DIABETES



BY **2035** THIS WILL RISE TO **592 MILLION**

50% ARE **UNDIAGNOSED**



MAJORITY ARE AGED: **40 - 59 YEARS**

4.9 MILLION PEOPLE **DIED** FROM DIABETES IN 2014

7 SECONDS

EVERY 7 SECONDS A PERSON **DIES** FROM DIABETES

TYPE OF DIABETES

TYPE 1
LACK OF INSULIN PRODUCTION

MORE THAN **79 000** CHILDREN DEVELOPED **TYPE 1 DIABETES IN 2013**

TYPE 2
BODY'S INEFFECTIVE USE OF INSULIN

90%

GESTATIONAL DIABETES
HYPERGLYCEMIA FIRST RECOGNIZED DURING PREGNANCY

MORE THAN **21 MILLION**

LIVE BIRTHS WERE **AFFECTED BY DIABETES** DURING PREGNANCY **IN 2013**

COMPLICATIONS

- ATHEROSCLEROSIS
- PERIODONTITIS
- BLINDNESS
- AMPUTATION
- KIDNEY FAILURE
- AMONG OTHERS

PREVENTION

30 MINUTES

OF FREQUENT-MODERATE INTENSITY PHYSICAL ACTIVITY AND HEALTHY DIET

*IF YOUR PATIENT HAS **NEVER** BEEN DIAGNOSED WITH DIABETES*

SYMPTOMS CHECKLIST[3]

Do you see any of the following signs in your patient?

- Red, swollen, bleeding gingivae that pull away from the teeth
- Gingival abscesses; loose teeth or tooth loss
- Dry mouth which may lead to gumline dental decay
- Candidal infections in the oral cavity
- Persistent halitosis, bad taste, or fruity acetone oral odor

If your patient shows several of the above symptoms, he/she could be at risk of DIABETES

So, ask him/her:

- Do you see frequent daytime or nighttime urination?
- Are you feeling excessively thirsty and hungry?
- Are you experiencing an unreasoned weight loss?
- Are you more tired or irritable than usual?
- Is your vision getting blurred?
- Are you experiencing longer wound healing time compared to the past?)

If the answer is YES to several of the above questions, ask your patient to complete this checklist:[7]

	YES	NO
Age:		
<45 Years Old	0 pts	0 pts
45-64 Years Old	5 pts	0 pts
>64 Years Old	9 pts	0 pts
Body Mass Index* above 27 (for Asian descents, BMI above 25)	5 pts	0 pts
I get little or no exercise during a usual day	5 pts	0 pts
I have given birth to a baby weighing more than 4 kg at birth	1 pts	0 pts
I have a sister or brother with diabetes	1 pts	0 pts
I have a parent with diabetes	1 pts	0 pts
I eat vegetables everyday	0 pts	3 pts
I use medicine for high blood pressure	5 pts	0 pts

*BMI= Weight (Kg)/ height^2 (m^2)

Result of Diabetes Risk:

- **Low risk >** 3-9 points
- **High risk >** 10 or more points

Patient Centric Action

*IF YOUR PATIENT HAS **ALREADY** BEEN DIAGNOSED WITH DIABETES*

(Type 1, type 2 or gestational diabetes)

Perform a thorough oral and periodontal examination

Periodontal Disease?

Other potential **oral complications?** (Dry mouth, burning mouth, candidal infections...)

YES:
Prompt oral/periodontal care

Encourage dental rehabilitation to restore adequate mastication for proper nutrition, if presence of extensive tooth loss

NO:
Preventive care regimen regularly monitored for periodontal changes

NOTE:
For children and adolescents diagnosed with diabetes, an annual oral screening for early signs of periodontal involvement is recommended starting at the age of 6 years

Oral health education should be provided to all patients with or without diabetes[3]

FOR THE GENERAL HEALTH PROFESSIONAL

Periodontal disease key points[1,4]

Identifying patients who are at risk of diabetes is a key point to prevent and monitor the development of periodontal disease. Early detection and treatment can significantly reduce the complications of diabetes.

EPIDEMIOLOGY

Inflammatory disease that affects the soft and hard structures supporting the teeth.

47.2% of adults aged **30 years and older** have some form of periodontal disease.

Gingival bleeding is highly prevalent among adult populations in all regions of the world.

10% to 15% of adults worldwide have advanced periodontal disease with deep pockets (6mm or more).

Periodontal disease increases with age.

70.1% of adults **65 years and older** have periodontal disease.

MEN	56.4%
WOMEN	38.4%
THOSE LIVING BELOW THE POVERTY LEVEL	65.4%
LESS THAN A HIGH SCHOOL EDUCATION	66.9%
CURRENT SMOKERS	64.2%

TYPE OF PERIODONTAL DISEASE

GINGIVITIS
First stage is gingivitis showing red and bleeding gums. An advanced and more serious stage is periodontitis.

PERIODONTITIS
Shows gums that pull away from the tooth with destroyed supporting gum tissues. Bone can be lost, and the teeth may loosen.

RISK FACTORS

Beside inflammation, a variety of factors can influence the severity of the disease including :

- INHERITED OR GENETIC SUSCEPTIBILITY
- SMOKING
- AGE
- DIET
- LACK OF ADEQUATE HOME CARE
- HEALTH HISTORY
- MEDICATION

PREVENTION[4]

- BRUSH TEETH
- BRUSH YOUR TONGUE
- USE INTERDENTAL CLEANING
- USE MOUTHWASH
- SEE A PERIODONTIST

SYMPTOMS CHECKLIST[4,5,6,7]

Do you see any of the following signs in your patient?

- Red, sore, swollen, receding or bleeding gums
- Loose or sensitive teeth
- Separation or elongation of teeth
- Presence or history of oral abscesses
- Halitosis
- Missing teeth
- Accumulation of calculus or plaque around teeth

If the answer is YES to several of the above points, ask your patient to see a periodontist for further investigation.

PATIENT MANAGEMENT[3,7]

Patients who do not have a diabetes diagnosis, but with obvious risk factors for diabetes and signs of periodontitis, should be informed about their risk. The full diagnosis of periodontal disease must be carried out at a dental office with X-rays and periodontal probing.

Advise your patient to visit a dentist twice a year to keep control of their periodontal status since a diabetic patient:

- Has an increased risk for periodontitis.
- If with periodontal disease, often shows a more difficult glycemic control and is usually at higher risk for other complications such as cardiovascular and kidney disease.
- Should be advised that other oral conditions such as dry mouth and burning mouth may occur, and if so, they should seek advice from their dental practitioner.
- Are at increased risk of oral fungal infections and experience poorer wound healing than those who do not have diabetes.

References

[1] www.who.int
[2] www.idf.org
[3] Chapple ILC, Genco RJ. Diabetes and periodontal diseases: consensus report of the Joint EFP/AAP Workshop on Periodontitis and Systemic Diseases. J Clin Periodontol 2013; 40 (Suppl. 14): S106–S112 doi: 10.1111/jcpe.12077.
[4] www.perio.org
[5] Grossi SG, Genco RJ. Periodontal disease and diabetes mellitus: A two-way relationship. Ann Periodontol 1998;3:51-61. 38.
[6] Soskolne WA, Klinger A. The relationship between periodontal diseases and diabetes: An overview. Ann Periodontol 2001;6:91-98
[7] Cheung S, Hsu WC, King GL, Genco RJ. Periodontal Disease, Its Impact on Diabetes and Glycemic Control. 2008

Diabetes, Oral Health & Nutrition

Notes

GLOBAL PARTNERS

FDI World Dental Federation

EFP European Federation of Periodontology

APSP

CO-ORGANIZERS

NUS National University of Singapore | Faculty of Dentistry

NUS National University of Singapore | Yong Loo Lin School of Medicine

SingHealth DUKE-NUS ACADEMIC MEDICAL CENTRE

SUPPORTING ORGANIZATIONS

A*STAR Clinical Nutrition Research Centre

Khoo Teck Puat Hospital Alexandra Health

ems SINGAPORE

College of General Dental Practitioners Singapore

Society of Periodontology Singapore

Association For Oral Health Therapists (Singapore)