

Oral Health Newsbites



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for partially
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Oral Health Newsbites is a bi-annual newsletter which highlights our key innovations and events under clinical research and education. In this first issue, we share some of the meaningful work and achievements of our clinicians, researchers, and educators who have contributed to the future of patient care and innovation.

The SingHealth Duke-NUS Oral Health Academic Clinical Programme (ORH ACP) was launched in August 2014. The ORH ACP brings together three clinical departments and six specialties across National Dental Centre Singapore (NDCS), KK Women's & Children's Hospital (KKH), SingHealth Polyclinics (SHP) and Changi General Hospital (CGH). ACP's main priorities include focusing on the four key Research Themes (Bone Bioengineering, Oral Devices and Therapeutics, Genomics / Biomarker Discovery and Health Services Research), nurturing budding clinician scientists, as well as collaborating with Duke-NUS on joint certification of Senior Residency and Fellowship Programs.

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CLINICAL INNOVATION

New automatic RPD design system for partially edentulous patients

A more pleasant patient journey for denture wearers

NDCS, together with A*STAR and ST Engineering, developed a software prototype to generate printable, patient-specific Removeable Partial Dentures (RPD) framework file from intra-oral scans, automatically. The new automatic RPD design system aims to reduce the time spent on denture production, improve the throughout of the denture

service and meet the rising demands of denture production for Singapore's ageing population.

The three-step system encompasses of the automated tooth identification, digitisation of RPD design and RPD voxelisation, the SmartRPD software will automatically process teeth configurations and generate

design patterns to fit the geometry of the patient.

The team proposed using a selective laser melting (SLM) technique to mass produce the Chrome-cobalt denture frame precisely. It could potentially improve the efficiency of denture production, enhance the quality of treatment and patient experience, and reduce cost. ^W

NDCS/NDRIS Stakeholders



Dr Seetoh Yoong Liang
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Partners:

Temasek Holdings (Funder)

A*STAR (Partner)

ST Engineering (Partner)

PanoShield: Face shields that offer panoramic protection

Enhancing safety for healthcare workers

Clinicians who perform aerosol-generating procedures are recommended to don Personal Protective Equipment (PPE) including gloves, protective outerwear, a face shield, and N95 masks, to prevent direct deposition of respiratory droplets on their faces. However, it was found that there are protection gaps despite such PPE measures – ineffective protection against fine respiratory droplets/aerosols, inadequate periphery protection, obtrusive operational constraint, and doffing risks.

The PanoShield is developed with the aims of enhancing peripheral protection, being compatible with essential supporting devices required by various clinical sub-specialties, and improving the user's comfort level.

It can be worn over existing PPE, is universally fitting, comfortable and secure for long hours, has anti-fogging properties and is easily scalable for manufacturing. ^W



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Partners:

SingHealth Medical Technology Office (SingHealth MTO)



The link between periodontitis and risk of gestational diabetes

Congratulations to Dr Preethi Prajod, who was awarded the NMRC Clinician Scientist Individual Research Grant – New Investigator Grant (CNIG) in 2020.



For the past few years, Dr Preethi has been working on the functional attributes of microbiota and immune responses at the intersection of oral-systemic health. Backed with this funding, her research study would examine the prospective association between periodontitis and the risk of Gestational Diabetes Mellitus (GDM) in pregnant women. One in every five pregnant women in Singapore have been observed to develop GDM. Women with GDM are at increased risk for foetal and maternal complications and are also associated with about seven-fold increased risk for developing type 2 diabetes mellitus in later life.

Periodontitis is treatable. If periodontal disease is confirmed as a risk factor for GDM through this initiative, it will open doors to intervention studies to prevent GDM. Improving oral health and

treating periodontal disease before and during pregnancy may reduce maternal and perinatal morbidity associated with GDM and prevent type 2 diabetes after pregnancy.

Most women do not seek oral health care during pregnancy despite evidence that poor oral health can adversely impact the health of a pregnant woman and her child. Concern about the safety of dental services during pregnancy restrict their visit to clinics. The strategy to change the perception of pregnant women is to include dental health education as an integral part of prenatal health care. To potentiate general health and well-being, women should routinely be counselled about the safety and maintenance of good oral health habits throughout their pregnancy. ¹

NDCS/NDRIS Stakeholders



Dr Preethi Prajod
Research Fellow,
ORH ACP NDRIS



A/Prof Chaminda
Jayampath
Seneviratne
Adjunct Professor
NDCS

Partners:

KK Women's and Children's Hospital (KKH)

Academic Center for Dentistry Amsterdam (ACTA)

A counterfactual approach on the effect of metabolic syndrome on tooth loss: a population-based study



The link between oral and general health is by default bidirectional, which makes the establishment of causality a core issue in health research. Prof Marco Peres' and his team's findings, based on cutting-edge epidemiological tools, provide evidence on the effect of Metabolic Syndrome (MetS) on tooth loss.

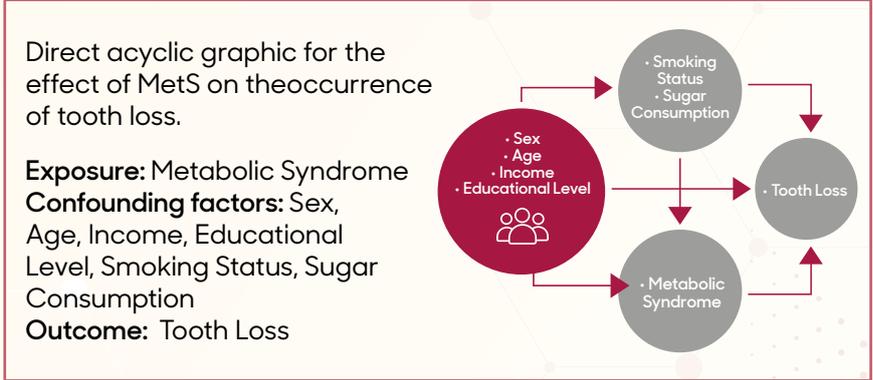
MetS and tooth loss are prevalent conditions that negatively affect health and quality of life, increases the cost of health care systems, and exacerbates social problems and inequalities. Even though some studies have addressed the association between MetS and tooth loss, the investigation of this relationship using an appropriate statistical approach and a representative sample of the population remains unexplored in the literature.

This study aimed to investigate the effect of MetS on tooth loss in a population-based sample. It was hypothesised that MetS has an effect on tooth loss. Studying this topic is essential to inform the best strategies to prevent tooth loss in populations with MetS and to encourage public policies that approach common risk factors to oral and general health.

This analysis was based on data from a cohort study (2009–2014) with adults aged 20+ from Southern Brazil. MetS (exposure), lack of functional dentition and number of lost teeth (outcomes) were assessed using self-reported, lab and clinical data. Possible confounders included sex, age, family income, educational level, smoking status and sugar consumption. The effect of MetS on the outcomes was estimated using conventional logistic or negative binomial regression models. Marginal structural modeling (MSM) with stabilized

weights (a counterfactual analytical method) was also used to enhance group comparability and estimate causal effects. Data imputation was used to deal with missing values. E-value was used to assess the effect of unmeasured confounders. 

1,283 participants had available information for the outcomes. Individuals with MetS were more likely to experience a lack of functional dentition than those without MetS [odds ratio (OR) from logistic regression 1.7, 95% CI 1.0–2.9; OR from MSM 3.2, 95% CI 2.3–4.6]. Moreover, the number of teeth lost was 20% higher in participants with MetS compared to those without MetS in conventional analysis (mean ratio [MR] 1.2, 95% CI 1.1–1.3). The MR increased to 1.7 (95% CI 1.5–2.0) when using MSM.



NDCS/NDRIS Stakeholders



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 NDRIS/NDCS,
 Duke-NUS



Karen G. Peres
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Partners: This study is part of the PhD thesis of

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Gustavo G. Nascimento
 (collaborator, Aarhus University, Denmark);

David A. Gonzalez Chica
 (collaborator, University of Adelaide, Australia)



EDUCATION DAY 2021

THE SCIENCE OF LEARNING

08.09.21

12.30 - 1.30PM

Education Day 2021 and ORH ACP Excellence in Teaching Awards

The ORH ACP Excellence in Teaching Awards were conferred to:

Since 2015, Education Day is an annual event held to commemorate our educators and learners. NDCS's Education Day was held on 8 September last year, and comprised of a lunchtime talk by Dr Song Yi Lin, Consultant, Department of Orthodontics, as well as the ORH ACP Excellence in Teaching Awards.

Dr Song's talk – The Science of Learning – delved into methods to optimise the learning process, make it easier to learn, remember, and apply knowledge.

The event was followed by a virtual Faculty Development Workshop, titled "Introduction to Team Based Learning Pedagogy". It was facilitated by Dr Foo Lean Heong, Consultant, Periodontic Unit, Department of Restorative Dentistry, and Dr Chan Pei Yuan, Consultant, Endodontic Unit, Department of Restorative Dentistry. 

AUXILIARY PROGRAMME

Dr Quek Heng Chuan
Senior Consultant,
Prosthodontic Unit,
Department of
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POST-GRADUATE

Dr Bien Lai
Head and Senior
Consultant,
Paediatric Dentistry
Unit, Department of
Restorative Dentistry



FY21 Grant and Award Recipients

FY2021 Grants and Recipients

| Grant | Recipient |
|--|-----------------------|
| GLOBICS: The Global consortium of Oral health-related Birth Cohort Studies | A/Prof Karen Peres |
| Temasek Foundation Public Health Innovations Grant | Dr Yu Na |
| A*STAR Industry Alignment Fund - Industry Collaboration Projects (IAF-ICP) | CI A/Prof Goh Bee Tin |
| Clinical Scientist Award | Dr Yu Na |

FY2021 Awards and Recipients

| Award | Recipient |
|--|-------------------------|
| Duke-NUS Hall of Master Academic Clinicians 2022 | CI A/Prof Goh Bee Tin |
| SingHealth Publish! Award 2021 | A/Prof Jaya Seneviratne |
| Singapore Health Quality Service Award | CI A/Prof Chew Ming Tak |

Scan this QR code for more information about NDCS research publications.

