

IADR

International Association for Dental Research

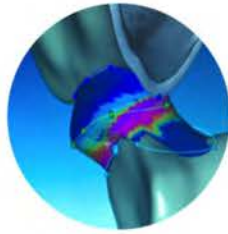
Australia & New Zealand Division



IADR ANZ 2015

PROGRAMME AND ABSTRACTS

Proudly hosted by the **Sir John Walsh Research Institute** at the Faculty of Dentistry, University of Otago and made possible by the generous support of *Colgate-Palmolive Australia & New Zealand*.





IADR

International Association
for Dental Research

Australia & New Zealand Division

55TH
ANNUAL
SCIENTIFIC
MEETING OF
THE IADR ANZ
DIVISION

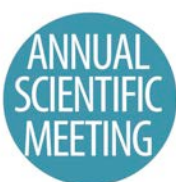
DUNEDIN PUBLIC ART GALLERY

THE OCTAGON, DUNEDIN, NZ

23-26 AUGUST, 2015

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Welcome to IADR ANZ 2015



Tēnā koutou, haere mai Aotearoa; Greetings and welcome to New Zealand.

On behalf of the Local Organising Committee I would like to extend a warm welcome to all delegates and guests attending the 55th Annual Scientific Meeting of the IADR Australia & New Zealand Division. This meeting is proudly hosted by the Sir John Walsh Research Institute at the Faculty of Dentistry, University of Otago, and made possible by the generous support of Colgate-Palmolive Australia and New Zealand.

The scientific theme of IADR ANZ 2015 is *Translational dentistry: from the laboratory to the clinic*. This is a timely theme and one that is increasingly more important in clinical practice, research funding, and government policy. I would argue that the concept of bench to bedside is insufficient, and we should extend the concept to bench to bedside and back.

We are privileged this year to welcome Professor Benjamin Wu of the University of California Los Angeles as this year's Colgate Eminent Speaker. Dr Wu is Professor and Chair of the Division of Advanced Prosthodontics, and the Director of the Weintraub Center for Reconstructive Biotechnology at the UCLA School of Dentistry. The program is also packed with other eminent national and international speakers including Adjunct Professor Antonio Barone (University of Pisa), Professor Paul Brunton (University of Otago), Associate Professor

Konstantinos Michalakis (Aristotle University of Thessaloniki School of Dentistry and Tufts University School of Dental Medicine), and Professor Svante Twetman (University of Copenhagen).

The format of the scientific programme is modelled on last year's Brisbane meeting which proved to be extremely successful, and I look forward to seeing it followed at future meetings. 135 abstracts were submitted of which 133 were accepted for inclusion in the scientific programme, with 183 registered delegates attending the meeting. This is an outstanding achievement, and one which the local organising committee should be proud of.

The Local Organising Committee should be congratulated on the excellent organisation, striking facilities, and high calibre scientific programme. My personal thanks extend to Professor Karl Lyons, Dr Vincent Bennani, Dr Jonathan Broadbent, Professor Richard Cannon, Associate Professor Nicholas Chandler, and Dr James Smith.

The Colgate Welcome Reception will be held at Dunedin Public Art Gallery, while the Gala Dinner will be held in the Josephine Foyer of the Toitū Otago Settlers Museum. I am particularly looking forward to the Gala Dinner, in what I'm sure will be a social highlight.

This meeting would not been possible without the generous support of Colgate Palmolive Australia & New Zealand as our major sponsor. We are fortunate to continue to have an outstanding partnership with Colgate Palmolive, and one we look forward to harnessing into the future.

This meeting will bring to conclusion my term as President of the ANZ Division of the IADR. It has been a great privilege to lead this Division and represent its interests at the international level. During this term the Division secured the rights to host the 4th Asia Pacific Region (APR) meeting of the

IADR to be held in Brisbane in 2019. We welcomed the Gold Coast Section and the Western Regional New South Wales Section, and finalised outstanding administrative and financial needs of the Sections to stimulate grass roots activity with centralised funding support through the Divisional Treasurer. Of course I am personally proud of the success of the 2014 Brisbane meeting and the positive energy that generated within our Division.

I am thankful for the support of the Executive team, Lindsay Richards, Linda Slack-Smith, Boyen Huang and Jason Armfield. I wish them all the best in their future roles within the Division, as I stand ready to support them in their endeavours.

Finally, while you are in New Zealand, don't forget to take time to explore beautiful Dunedin, and perhaps venture a little further afield and enjoy the picturesque landscape of *whenua roa tea ao*.

Once again welcome to Dunedin.

Yours sincerely,



Camile S. Farah

President, International Association for Dental Research, Australian & New Zealand Division

55th Annual Scientific Meeting of the IADR, Australian/New Zealand Division



Welcome to the 55th Annual Scientific Meeting of the International Association for Dental Research, Australian & New Zealand Division, Dunedin Public Art Gallery, Dunedin, New Zealand.

On behalf of the Local Organising Committee I would like to welcome all delegates and guests to the 55th IADR ANZ Division meeting in Dunedin. The scientific programme contains 133 presentations and we are pleased that of the 184 registrants 90 are students - and we are thus able to foster the future of dental research in Australasia and the Pacific. We truly hope that you will find the meeting to be a scientific and social success, and that you enjoy your stay in Dunedin.

The scientific programme includes local and international speakers, in a series of plenary and open oral sessions in addition to poster presentations. The theme for this year's meeting is *Translational Dentistry – from the laboratory to the clinic* and I trust that the three days of the scientific programme will inspire new ideas, foster collaborations, and encourage further dental research in this direction. We should also recognize that it is important to translate our research from the clinic to the community and it is encouraging to see several sessions focusing on behavioural epidemiologic and health services research.

I am very pleased to welcome Professor Ben Wu as this year's Colgate Eminent Speaker. Ben is a practicing clinician and biomaterial scientist who is

Professor and Chair of the Division of Advanced Prosthodontics at the UCLA School of Dentistry, and also chairs the Department of Bioengineering at the UCLA School of Engineering. Ben and will be addressing us on Biomimetic Strategies for Tissue Regeneration. We are also fortunate to be hosting Adjunct Professor Antonio Barone (School of Dental Medicine, University of Pisa, and Co-Director, Division of Oral Surgery, Versilia Hospital, Italy), Professor Paul Brunton (Faculty of Dentistry, University of Otago, New Zealand), Associate Professor Konstantinos Michalakis, (Department of Prosthodontics, Aristotle University of Thessaloniki School of Dentistry, Greece), and Professor Svante Twetman (Department of Dentistry, University of Copenhagen, Denmark), who will be delivering keynote presentations as part of the plenary sessions.

The Colgate Welcome Reception will commence in the Dunedin Public Art Gallery directly after the conclusion of presentations on the first day of the scientific programme, and the Conference Dinner will be held on Tuesday evening at the recently restored Toitu Otago Settlers Museum in Dunedin.

This conference would not have been possible without the generous support of our sole sponsor Colgate Palmolive. Special thanks to Dr Susan Cartwright and Dr Rebecca Schipper for the ongoing support and assistance from Colgate.

My personal thanks go to the members of the Local Organising Committee, Professor Richard Cannon (who chaired the scientific programme committee), Dr James Smith (chief conference organiser), Associate Professor Nick Chandler, Dr Jonathan Broadbent and Dr Vincent Bennani. I would also like to thank Professor Camile Farah for all of his advice and support over the last 12 months and Professor Boyen Huang for his assistance with correspondence and communication with members and delegates.

I hope you have the opportunity to explore Dunedin during your stay, and if you have the time, the beautiful Otago region.

Welcome to Dunedin.

Yours sincerely

A handwritten signature in black ink that reads "Karl Lyons". The signature is written in a cursive, slightly slanted style.

Karl Lyons

Chair, Local Organising Committee, 55th IADR ANZ Annual Scientific Meeting

Quick start guide

Location and venue

The venue for the 55th Annual Scientific Meeting of the International Association for Dental Research Australia & New Zealand Division is the Dunedin Public Art Gallery (DPAG), The Octagon, Dunedin.

An IADR ANZ council meeting and an Australasian Council of Dental Schools (ACODS) meeting will be held at DPAG on Sunday, 23 August, preceding the Annual Scientific Meeting which will open on the morning of Monday, 24 August and run through to the afternoon of Wednesday, 26 August.

Scientific programme

The theme of IADR ANZ 2015 is *Translational dentistry: from the laboratory to the clinic*.

The Colgate Eminent Speaker is **Professor Benjamin Wu** of the University of California at Los Angeles. Professor Wu is Professor and Chair of the Division of Advanced Prosthodontics, and the Director of the Weintraub Center for Reconstructive Biotechnology at the UCLA School of Dentistry.

We are also pleased to welcome the following invited keynote speakers:

- **Adjunct Professor Antonio Barone** (University of Pisa)
- **Professor Paul Brunton** (University of Otago)
- **Associate Professor Konstantinos Michalakos** (Aristotle University of Thessaloniki School of Dentistry)
- **Professor Svante Twetman** (University of Copenhagen)

Concurrent oral presentation sessions are scheduled for both Tuesday and Wednesday. On Monday there will be a single oral presentation

session and a closed Colgate Poster Competition judging session.

There will be two sessions for displaying Posters, one for Colgate competition entrants and one for general posters. Posters will be displayed for the full day. For further details, see the **Information for presenters** section beginning page 10.

Social programme

The **Colgate Welcome Reception** will be held at DPAG, in the Donaghys Foyer on the ground floor, on Monday 24 August, beginning at 5.30pm.

The **Conference Gala Dinner** will be held in the Josephine Foyer of the Toitū Otago Settlers Museum, commencing 6.30pm for a 7pm start.

Venues and accommodation

The **Dunedin Public Art Gallery** is situated in the Octagon, in the centre of Dunedin City (at the junction of George/Princes St and Stuart St.) It is located within easy walking distance from hotels, restaurants and all major public transport routes.

The **Toitū Otago Settlers Museum** is situated on Queens Gardens, just south of the iconic Dunedin Railway Station.

The official conference hotel of IADR ANZ 2015 is **Scenic Hotel Dunedin City**, situated on Princes Street in the CBD, just south of the Octagon.

Please refer to the Dunedin city maps on pages 8 and 9 for more information.

For further details on Dunedin tourist attractions, bars and restaurants, things to see and do, and lots of other useful information to make the most of your stay here, visit <http://www.dunedinnz.com>.

Information for registrants

Registration

The registration desk is situated on the second floor of the DPAG, at the entrance to the Otago Daily Times Gallery. The Registration desk will be open on Sunday (23 August) from 4-5pm, and Monday through Wednesday (24-26 August) from 8-9am.

Personalised lanyards, including a mini programme, will be provided to all registered delegates. Delegates are required to wear their name badges at all times during scientific sessions, meal breaks and social events.

Internet access

Free wifi is available within the DPAG. To access free wifi, connect via DCC FREE WIFI on your device's list of available networks. Please note that wifi access is not available in the Auditorium.

Social media

We welcome the use of social media to promote IADR ANZ 2015 and communicate its findings. Please use the hashtag *#iadrnz* in social media posts related to the conference. Session chairs and presenters will confirm whether live-tweeting or other social media communication of the content of their sessions or presentations is allowed.

DPAG facilities

The [ODT Gallery](#) (second floor) is the location for the Poster presentations, meal breaks (morning tea, lunch and afternoon tea) and registration desk.

The [Auditorium](#) (first floor, Wenita Gallery) is the larger of the two theatre-style spaces at the DPAG, and will be the location for the opening and closing

ceremonies, Colgate Eminent Lecturer and Keynote Speaker presentations.

Concurrent Oral Sessions are divided between the Auditorium and the [Conference Room](#) (second floor, accessed via the ODT Gallery.)

Meals

Morning tea, lunch and afternoon tea will be available for all registrants in the ODT Gallery on Monday and Tuesday. Morning tea and lunch will be available on Wednesday. Entrance is by name badge. If you have not already notified the conference organisers of your dietary requirements you may have, please do so as soon as possible, otherwise we may not be able to accommodate your needs.

Colgate Welcome Reception

The Colgate Welcome Reception will be held at DPAG, in the Donaghys Foyer on the ground floor, on Monday 24 August, beginning at 5.30pm. Drinks and canapés will be provided, thanks to the generous support of Colgate. Entrance is by name badge.

Conference Gala Dinner

The IADR ANZ 2015 Conference Gala Dinner will be held in the Josephine Foyer of the Toitū Otago Settlers Museum, commencing with pre-dinner drinks at 6.30pm for a 7pm start. Entrance will be by name badge. Dress code will be smart casual. The menu will be themed around 'Tastes of the South Island', featuring local produce, wine and craft beer. Winners of the Colgate Poster Competition and IADR ANZ awards will be announced at the Gala Dinner.

About the DPAG

The Dunedin Public Art Gallery is one of New Zealand's four major metropolitan art galleries. Established in 1884, the DPAG was New Zealand's first Art Gallery and is renowned today for the richness of its historic collection and its close working relationship with major New Zealand artists. The DPAG houses a significant collection of New Zealand artworks covering the period from 1860 to the present. The collection also contains major holdings of historical European art, Japanese prints and the decorative arts. Historical works by renowned artists such as Turner, Gainsborough, Claude, and Machiavelli feature alongside the only Monet in a New Zealand collection and master works by Derain, Tissot, Burne-Jones and internationally acclaimed Dunedin artist Frances Hodgkins.

For more information on the DPAG, please visit <http://dunedin.art.museum>.

About Toitū OSM

Toitū Otago Settlers Museum is a museum of social history dedicated to telling the story of the people of Dunedin and the surrounding area, whose character, culture, technology, art, fashion and transport shaped New Zealand's first great city.

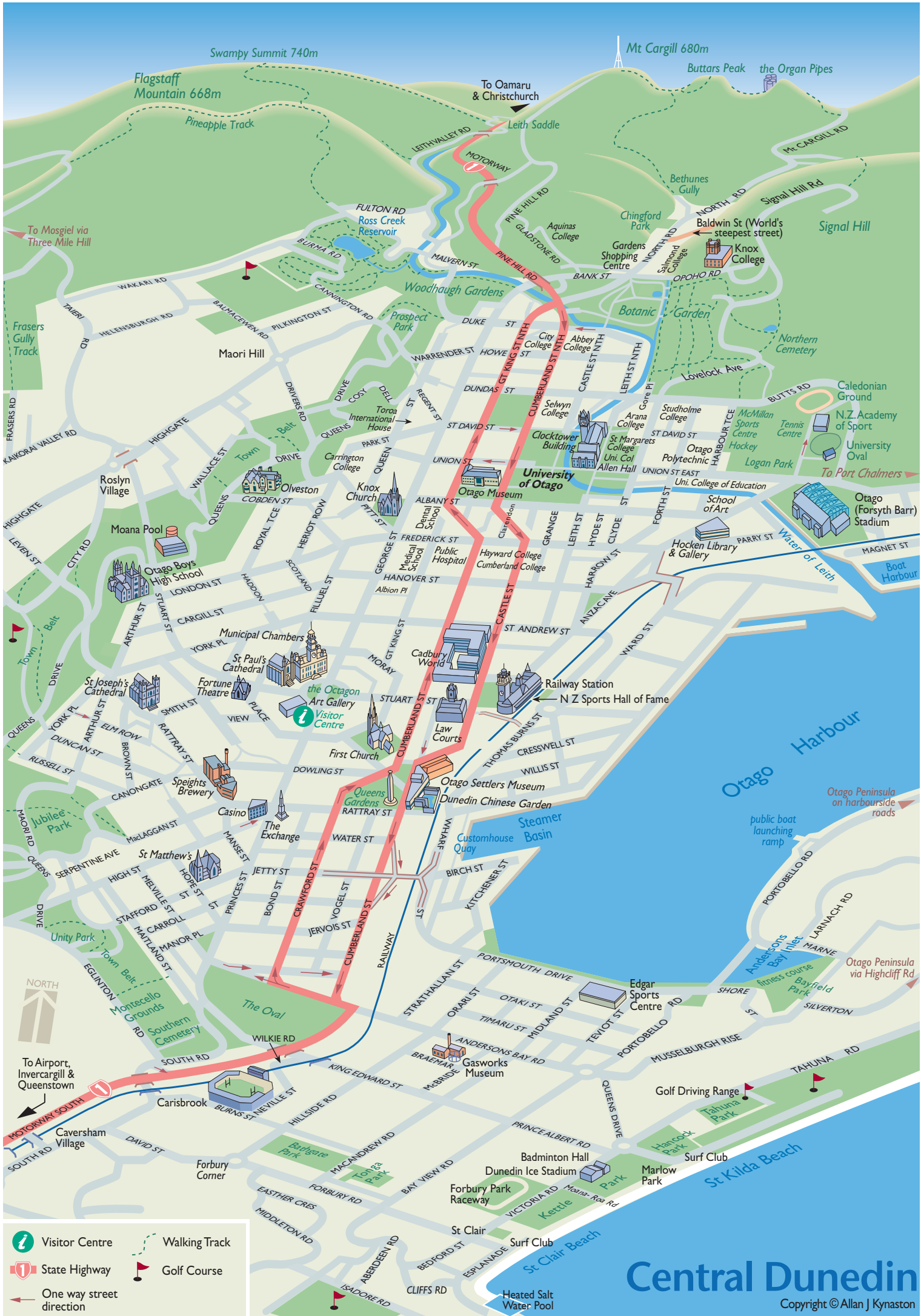
For more information on Toitū OSM, please visit <http://www.toituosm.com/>.



Dunedin city maps

Below: Detail map of Dunedin CBD, highlighting IADR ANZ 2015 locations (courtesy Google Maps.)
Overleaf: Central Dunedin map courtesy Tourism Dunedin (www.dunedinnz.com).





Swampy Summit 740m

Flagstaff Mountain 668m

Mt Cargill 680m

Buttars Peak the Organ Pipes

To Oamaru & Christchurch

To Mosgiel via Three Mile Hill

Signal Hill

Frasers Gully Track

Maori Hill

Roslyn Village

Moana Pool

Otago Boys High School

St Joseph's Cathedral

Fortune Theatre

the Octagon Art Gallery Visitor Centre

Speights Brewery

Casino

St Matthew's

Unity Park

Monticello Grounds

Southern Cemetery

The Oval

To Airport, Invercargill & Queenstown

Carisbrook

Forbury Corner

Baglyre Park

Forbury Park Raceway

St Clair

Heated Salt Water Pool

Leith Saddle

FULTON RD Ross Creek Reservoir

Woodhaugh Gardens

Prospect Park

Maori Hill

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Chingford Park

Baldwin St (World's steepest street)

Knox College

City College

Abbey College

Selwyn College

Arana College

Studholme College

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Caledonian Ground

N.Z. Academy of Sport

University Oval

McMillan Sports Centre

Hockey

Tennis Centre

Logan Park

Uni. College of Education

School of Art

Hocken Library & Gallery

Water of Leith

Boat Harbour

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Boat Harbour

Boat Harbour

Otago Harbour

Otago Peninsula on harbourside roads

public boat launching ramp

Andersons Bay Jettie

fitness course

Bayfield Park

Otago Peninsula via Highcliff Rd

SHORE ST

MUSSELBURGH RISE

TAHUNA RD

St Kilda Beach

St Clair Beach

St Clair Beach

St Clair Beach

Central Dunedin

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-  Visitor Centre
-  Walking Track
-  State Highway
-  Golf Course
-  One way street direction

Information for presenters

Oral presentations

Fifteen oral presentation sessions have been scheduled from submitted abstracts, in between presentations from invited keynote speakers and the Colgate Eminent Lecturer. Oral sessions will be held concurrently on Tuesday and Wednesday, in the Auditorium and Conference Room.

Most oral presentations are of 15 minutes duration, with presenters provided with 10-12 minutes to present their research, with 3-5 minutes set aside for questions. A selection of speakers have been invited by the Session Chair or the Local Organising Committee to give longer presentations; these are identified in the Programme.

The programme is on pages 17-18, and reproduced on the back cover of the Programme & Abstracts book and within your name badge insert.

Audiovisual & IT requirements

In both the Auditorium and Conference Room, we will provide a MacBook Pro laptop (OSX Yosemite) running PowerPoint 2011, data projector, screen, lectern, lectern microphone, and laser pointer.

If you will be using your own laptop, please advise us as soon as possible, so that we can enable a smooth changeover between speakers. Likewise, if your presentation requires video, audio, streaming internet or an alternative presentation platform (such as Keynote), please let us know.

All oral presenters are requested to have their presentations loaded **an hour prior to the session in which they are speaking**. Please liaise with your Session Chair and the Local Organising Committee personnel stationed in the Auditorium or Conference Room to upload your presentation in a timely manner.

Poster presentations

There will be two sessions for exhibiting research posters, one for Colgate competition entrants on Monday and one for general posters on Tuesday. Posters are to be displayed for the full day (i.e. presenters are required to put their posters up by 9am and remove them after 5pm).

All authors are asked to be near their poster during morning and afternoon tea and lunch breaks. The Poster Sessions are an opportunity for delegates to approach the author of the poster and ask questions or discuss any element of the information displayed.

Posters must be no larger than 2 m high x 1 m wide, in portrait orientation, and poster presenters are requested to provide their own Velcro 'hooks' or pins to display their posters.



Colgate Poster Competition

Colgate Poster Competition entrants will be judged on Monday in the ODT Gallery and Conference Room, in one of three sessions – CP1 (11am-12.30pm), CP2 (2.15-3pm) or CP3 (3.30-5pm). Entrants will be notified regarding the session in which their poster will be judged. Posters will be judged in three categories, similar to those used for the Hatton Competition at IADR General Sessions:

- Junior
- Senior, Basic Research
- Senior, Clinical/Preclinical Research

Colgate Competition entrants have 5 minutes to present their poster to the judges, followed by up to 5 minutes of Q&A.

Terms and conditions

By presenting at the conference, you agree to the following terms and conditions:

1. Presenters take full responsibility for the content of their abstract and presentation
2. You understand your abstract and biographical information will be published in the conference proceedings. Your abstract must not have been published elsewhere at the time of presenting.
3. You will not use your presentation as means of selling your organisation's products or services.
4. Where required, you will commence your presentation with a Conflict of Interest declaration.
5. You will undertake to provide required items to the Conference Organisers in a timely fashion.

Disclaimer

The IADR ANZ 2015 Local Organising Committee reserves the right to amend or alter any advertised details relating to dates, program and speakers if necessary and without notice, as a result of circumstances beyond their control. All attempts will be made to keep any changes to an absolute minimum.

Local Organising Committee

Professor Karl Lyons

Oral Rehabilitation, Faculty of Dentistry, University of Otago

Chair, IADR ANZ 2015 LOC



Professor Richard Cannon

Sir John Walsh Research Institute, Faculty of Dentistry, University of Otago

Chair, Scientific Programme



Dr Vincent Bennani

Oral Rehabilitation, Faculty of Dentistry, University of Otago



Dr Jonathan Broadbent

Oral Rehabilitation, Faculty of Dentistry, University of Otago



Associate Professor Nick Chandler

Oral Rehabilitation, Faculty of Dentistry, University of Otago



Dr James Smith

Sir John Walsh Research Institute, Faculty of Dentistry, University of Otago



Colgate Eminent Lecturer



**Professor
Benjamin Wu**
DDS PhD

Department of Bioengineering, School of Engineering, and Division of Advanced Prosthodontics, School of Dentistry, University of California at Los Angeles, Los Angeles, USA

Professor Ben Wu obtained his residency training in Advanced Prosthodontics at Harvard, and his PhD in Materials Engineering at the Massachusetts Institute of Technology. At MIT, he developed the powder-binder interaction physics for 3D Printing of biomedical relevant materials, and published the first papers on 3D Printed drug delivery devices and tissue engineering scaffolds. Dr Wu is currently Professor and Chairman of Division of Advanced Prosthodontics in the UCLA School of Dentistry, and Chairman of the Department of Bioengineering in the UCLA School of Engineering. He is Director of the Weintraub Center for Reconstructive Biotechnology, and holds joint faculty appointment in the Departments of Materials Science and Engineering, and the Department of Orthopedic Surgery. He has published over 150 papers and delivered over 100 lectures in the development of material-based solutions to promote tissue regeneration and wound healing.

Dr Wu provides clinical patient care in the UCLA Faculty Dental Group Practice, and serves on numerous advisory committees in academia and industry.

Biomimetic strategies for tissue regeneration

MONDAY 24 AUGUST, 9.30 - 10.30 AM

Regenerative medicine aims to regenerate tissues by the purposeful manipulation of progenitor cells and their surrounding niche. This presentation will highlight some of the biomimetic tissue engineering strategies that are being utilized in our lab to recapitulate selected aspects of embryonic development and tissue remodeling. From the development of a novel growth factor that promotes bone formation, to a better understanding of material-cell behavior of a popular biomaterial, to the use of biomechanical forces to regenerate complex organs, this presentation will outline the current possibilities, challenges and opportunities ahead.

Keynote presenters



**Adjunct Professor
Antonio Barone**
DDS MSc PhD

School of Dental Medicine, Department of Surgical, Medical, Molecular Pathology, University of Pisa, Italy; and Co-Director, Division of Oral Surgery, Tuscan Dental Institute, Foundation for Dental Research, Clinic and Continuing Education, Versilia Hospital, Lido di Camaiore, Lucca, Italy.

Dr Barone is currently Adjunct Professor at the School of Dental Medicine of the University of Pisa, Italy. Dr Barone is Co-Director of the Division of Oral Surgery at the Versilia Hospital, Lucca, Italy where he also co-ordinates the Oral Sciences research activity. He is the President of the European Federation of Oral Surgery Societies (EFOSS) and Past-President of the Italian Society of Oral Surgery and Implantology (SICOI). Professor Barone is also Clinical Assistant Professor, Department of Oral and Maxillofacial Surgery, State University of New York at Buffalo, USA and Visiting Assistant Professor at the Department of Periodontology, State University of New York at Stony Brook, USA. His research focuses on the use of different biomaterials for bone augmentation procedures in implant patients. Dr Barone has extensively investigated the biological and clinical aspects of several implant surgical and restorative procedures with immediate post-extraction implants, immediate loading, sinus lift and ridge preservation techniques.

Translating the science of bone augmentation into clinical practice

TUESDAY 25 AUGUST, 9.00 - 9.45 AM

This lecture describes the basic biologic principles of bone augmentation and how they can be translated to practical clinical use. The lack of alveolar bone volume represents a real clinical challenge for oral rehabilitation. In presence of bone deficiencies, the primary aim is to regenerate the lost alveolar bone volume and to allow a functional and aesthetic oral rehabilitation. Due to its properties, autogenous bone is considered the gold standard for bone augmentation, though its use is limited for additional harvesting procedures and consequent patient morbidity. Bone tissue engineering has been identified as an alternative to autogenous bone grafting. The basic principles of tissue engineering rely on osteoprogenitor cells, osteoinductive signals and osteoconductive scaffolds. Therefore, the application of these principles could potentially replicate the regenerative properties of autogenous bone without the drawbacks of bone harvesting. The lecture then describes the different approaches that may be considered in managing the clinical situation and how an expert in the field makes a treatment decision that is informed by the evidence.



**Professor Paul
Brunton MSc PhD**

*Dean, Faculty of Dentistry, University of Otago, Dunedin,
New Zealand*

Professor Brunton recently joined the University of Otago from the University of Leeds, Leeds, UK. At the University of Leeds School of Dentistry, Professor Brunton was the Director of Student Education. Professor Brunton graduated from University of Leeds, School of Dentistry in 1984 and obtained his MSc in Restorative Dentistry in 1992 and his PhD in 1996 from the University of Manchester. Professor Brunton was granted his fellowship in Dental Surgery from The Royal College of Surgeons of Edinburgh in 1995 and subsequently was awarded Fellowship ad eundem of the Faculty of General Dental Practice (UK) of the Royal College of Surgeons of England in 2005 and of the Faculty of Dental Surgery of The Royal College of Surgeons of England in 2009. Professor Brunton is a member of the Academy of Operative Dentistry having previously served on its research committee. He is currently a member of the advisory board to the European Section of the Academy of Operative Dentistry. Professor Brunton's research interests include operative dentistry, specifically tooth preparation and tooth whitening, the early diagnosis and treatment of tooth wear and practice based research.

Research: If you can't translate, why bother?

MONDAY 24 AUGUST, 1.30 - 2.15 PM

Solutions to the oral health problems of today are a strategic priority for academics who work in Dental, Oral and Craniofacial research. As such we have a most important role in shaping the future agenda with respect to Dental, Oral and Craniofacial Research but also in promoting and delivering research in this space. This presentation will explore some concepts around the direction and shape of oral health research going forwards, what the priorities are and how we might address them. The role of challenge-led research in developing research questions and its interface with clinical and laboratory research and how we can translate and or commercialise our research more effectively will also be discussed. An example of a translational research project that was successful will be presented in detail. To achieve our objectives we need to train the academic workforce of tomorrow and some ideas about how we can support research, training, career development programmes that value and promote science will also be outlined.



Associate
Professor
Konstantinos
Michalakis
DDS MSc PhD
FACP

Department of Prosthodontics, Aristotle University of Thessaloniki School of Dentistry, Thessalonica, Greece and Adjunct Associate Professor, Department of Prosthodontics and Operative Dentistry, Tufts University School of Dental Medicine, Boston, MA, USA

Professor Michalakis is Clinical Director of Graduate Prosthodontics, Department of Prosthodontics at the Aristotle University of Thessaloniki School of Dentistry. He is a fellow of the American College of Prosthodontists and a member of the American Academy of Fixed Prosthodontics, the Academy of Osseointegration, the European Association for Osseointegration, the International College of Dentists and the European Society of Biomechanics. Professor Michalakis' research interests include biomechanical properties of teeth and osseointegrated implants.

The influence of bone's elasticity on the apical migration of a natural tooth connected to an osseointegrated implant with a non-rigid attachment:
A 3D Finite Element Analysis

Giannopoulos D¹, Tsouknidas A², Lympoudi E¹, Pissiotis A¹, Michailidis N², Michalakis K^{1,3}

¹Aristotle University School of Dentistry, Dept. of Prosthodontics, Thessaloniki, Greece;

²Aristotle University School of Engineering, Dept. of Mechanical Engineering, Thessalonik, Greece;

³Tufts University School of Dental Medicine, Division of Postgraduate Prosthodontics, Boston, MA, USA

WEDNESDAY 26 AUGUST, 9.00 - 9.45 AM

Connection of a tooth to an implant is a rational alternative in some clinical situations. The complex biomechanical aspects of a tooth-implant connection result from the dissimilar mobility patterns of the splinted parts. One of the major biological complications, according to the literature, is the apical migration of the tooth. Several theories have been developed in order to explain this phenomenon. However, none of these theories associated the intrusion phenomenon with the quality of the surrounding bone.

The purpose of this study was to investigate the biomechanical interactions in tooth-implant supported fixed partial dentures (FPDs), in four different types of bone quality, when different connector types (rigid vs. non-rigid) were used. Materials and methods: A FPD model consisting of one 4 x 13mm implant placed in the mandibular first molar region splinted to the first premolar was fabricated with barium containing wax. On this model, a CBCT radiograph was taken. A 3D image was obtained by use of appropriate software. Frictional contact elements were used to simulate realistic interface conditions. The investigated factor was the apical migration of the tooth by altering the following independent variables: a) bone quality, b) connector type (rigid vs. non-rigid). The mathematical analysis of the data was completed after feeding of the physical properties of the involved materials. Results: The results indicated that the lateral forces significantly increased the bone stress values when compared with the axial ones. The stress values increased with the reduction of bone density. The leading role of the loading conditions on the stress values and patterns was confirmed by this study.

Conclusion: Bone quality is a parameter that can contribute to the prognosis of the entire prosthesis, when the other factors (load, alloy, connector type) are properly weighed.



Professor Svante Twetman
DDS PhD Odont Dr

Department of Dentistry, Section for Cariology, Endodontics, Pediatric Dentistry & Clinical Genetics, University of Copenhagen, Copenhagen, Denmark

Professor Twetman is a licensed specialist in pediatric dentistry and professor of Cariology at the Faculty of Health and Medical Sciences, University of Copenhagen, Denmark and consultant at the Maxillo-facial unit at Halland Hospital, Halmstad, Sweden. He holds the Odont Dr Degree from the Karolinska Institute, Stockholm, Sweden. Professor Twetman's current research interests are risk assessment and prevention of oral diseases, focused on oral and microbial ecology with special emphasis on fluoride, antibacterial agents, sugar-substitutes, and pre- and probiotic bacteria.

Probiotics for oral health: facts vs. fiction

TUESDAY 25 AUGUST, 1.30 - 2.15 PM

Recent insights concerning the importance of a natural microbial diversity and stability in oral biofilms for the maintenance of health have brought a new concept to dentistry; biofilm control and engineering rather than biofilm elimination and restorative care. Consequently, an emerging interest in the use of pre- and probiotic bacteria has been evident in literature during recent years, albeit the mechanisms of action are still

largely unknown. The lecture will provide a brief background on the role of oral biofilms in health and disease and the potential influence of beneficial bacteria to prevent dysbiosis. Based on clinical trials the evidence for probiotic therapy within dentistry will be summarized. The main vehicles for administration are dairy products or tablets/lozenges/drops. Systematic reviews have displayed good evidence of an antagonistic role for probiotic lactobacilli and bifidobacteria against salivary mutans streptococci.

Although prospective studies with a high risk of bias have shown a reduced caries incidence and root caries arrest, the effect of probiotic supplements on lesion development is controversial. However, probiotic interventions early in life seem promising since the timing and sequence of exposure to beneficial and harmless bacteria has a strong influence on the composition and development of the oral biofilm. Other trials have reported beneficial effects on endpoints related to gingivitis and periodontitis such as plaque index, bleeding on probing, pocket probing depth, mucositis, subgingival microbiota, salivary IgA and pro-inflammatory cytokine levels in gingival crevicular fluid. Collectively, the findings suggest a role of probiotic supplements as adjunct to the existing "best clinical practice" although a certain publication bias cannot be excluded. To date, no dramatic adverse effects have been reported but the optimal dose, and mode of administration, remains unclear. Further well-conducted research is needed to confirm the existing findings before clinical recommendations can be established.

IADR ANZ 2015 PROGRAMME

Time	Sunday 23 August		Monday 24 August			
	Art Society Room	Conference room	Auditorium	Conference room		
8am-9am			Registration (GAL)			
9.00am			Opening/Welcome (AUD)			
9.15am			Colgate Eminent Lecturer (AUD) Prof Ben Wu: Biomimetic strategies for tissue regeneration			
9.30am						
9.45am						
10.00am						
10.15am						
10.30am			Morning tea & Poster Session 1 (GAL)			
10.45am			Estie Kruger Dominic Keuskamp Sofia Christofis Leonard Crocombe Helen Tane	Colgate Poster Competition (Closed session; ODT Gallery & CR)		
11.00am	ACODS meeting					
11.15am						
11.30am						
11.45am						
12.00pm	Lunch: ACODS & IADR ANZ Council		Lunch & Poster Session 1 (GAL)			
12.15am						
12.30pm						
12.45pm						
1.00pm						
1.15pm	ACODS meeting (to 5pm)	Council meeting (to 5pm)	Keynote presentation (Auditorium) Prof Paul Brunton: Research - If you can't translate, why bother?			
1.30pm			Peter Arrow Kamal Hanna Archana Pradhan		Colgate Poster Competition (Closed session)	
1.45pm						
2.00pm						
2.15pm			Afternoon tea & Poster Session 1 (GAL)		Angela Durey Dandara Haag Shahrukh Khan Ninuk Hariyani Katie Beckwith Sanjeewa Kularatna	
2.30pm						
2.45pm						
3.00pm						
3.15pm	Registration (GAL)		Colgate Poster Competition (Closed session)			
3.30pm						
3.45pm						
4.00pm						
4.15pm						
4.30pm			Colgate Welcome Reception (DPAG) 5.30pm - 7.00pm			
4.45pm						
5.00pm						
5.30pm						
7.00pm						

Session 1 Mon 11am-12.30pm (AUD)
Behavioural, Epidemiologic & Health Services Research 1

Session 2 Mon 2.15-3pm (AUD)
Behavioural, Epidemiologic & Health Services Research 2

Session 3 Mon 3.30-5pm (AUD)
Behavioural, Epidemiologic & Health Services Research 3

Session 4 Tue 9.45-10.30am (AUD)
Oral Medicine and Pathology 1

Session 5 Tue 11am-12.30pm (AUD)
Oral Medicine and Pathology 2

Session 6 Tue 2.15-3pm (AUD)
Oral Microbiology and Probiotics 1

Time	Tuesday 25 August		Wednesday 26 August	
	Auditorium	Conference Room	Auditorium	Conference Room
8am-9am	Registration (GAL)		Registration (GAL)	
9.00am	Keynote presentation (AUD)		Keynote presentation (AUD)	
9.15am	A/Prof Antonio Barone: Translating the science of bone augmentation into clinical practice		A/Prof Konstantinos Michalakakis: Attachment of teeth to osseointegrated implants	
9.30am				
9.45am	Camile Farah	Chris Peck	Vincent Bennani	Carol Tran
10.00am				Atieh Sadr
10.15am	Benedict Seo		Michael Brosnan	Andrew Flatau
10.30am	Morning tea & Poster Session 2 (GAL)		Kristeh Bhai	Mark Storrs
10.45am			Morning tea (GAL)	
11.00am	Hina Narayan	Jonathan Broadbent	Linda Slack-Smith	Mirza Baig
11.15am	Jyothi Tadakamadla			Orit Oettinger-Barak
11.30am	Ratu Gavidi	Camile Farah	Ankur Singh	Alex Quaranta
11.45am	Narmin Nasr			Saeed Idrees
12.00pm	Dawn Coates	Peck, Broadbent, Farah Q & A	Reginald Kumar	Zahra Sarabadani
12.15am	Saso Ivanovski		Temalesi King	
12.30pm	Lunch & Poster Session 2 (GAL)		Mele Foliaki	
12.45pm			Closing ceremony (AUD)	
1.00pm	IADR ANZ AGM (AUD)		Lunch (GAL)	
1.15pm				
1.30pm	Keynote presentation (Auditorium)			
1.45pm	Prof Svante Twetman: Probiotics for oral health: facts vs. fiction			
2.00pm				
2.15pm	John Tagg	Kenji Takada	Session 9 Tue 11am-12.30pm (CR) <i>ACODS - Planning For Success in Dental Research 2</i>	
2.30pm	Christina Adler	Ghassan Idris		
2.45pm				
3.00pm	Afternoon tea & Poster Session 2 (GAL)			
3.15pm				
3.30pm	Richard Cannon	Alan Brook	Session 10 Tue 2.15-3pm (CR) <i>Craniofacial Biology 1</i>	
3.45pm	Mercedes Mostajo			
4.00pm	Mohd Hafiz Arzmi	Catherine Carleton	Session 11 Tue 3.30-5pm (CR) <i>Craniofacial Biology 2</i>	
4.15pm	Sarah Raphael	Manjara Packianathan		
4.30pm	Santosh Tadakamadla	Mohamad Al Dujaili	Session 12 Wed 9.45-10.45am (AUD) <i>General Dental Research</i>	
4.45pm	Nick Heng	Azza Al-Ani		
5.00pm				
6.30pm	Conference Gala Dinner (Toitu OSM) 6.30pm - 11pm		Session 13 Wed 11.15-12.45am (AUD) <i>Behavioural, Epidemiologic & Health Services Research 4</i>	
11.00pm				
Session 7 Tue 3.30-5pm (AUD) <i>Oral Microbiology & Probiotics 2</i>				
Session 8 Tue 9.45-10.30am (CR) <i>ACODS - Planning For Success in Dental Research 1</i>				
Session 14 Wed 9.45-10.45am (CR) <i>Education Research: Best Practices in Clinical Teaching</i>				
Session 15 Wed 11.15-12.30pm (CR) <i>Biomechanics and Tissue Engineering</i>				

Oral presentation sessions

Monday, 24 August

Session 1 *Behavioural, Epidemiologic and Health Services Research 1: Epidemiology, economics & inequalities*
Chair: Prof W Murray Thomson, University of Otago Location: Auditorium, Level 1

11.00-11.30am	The inverse care law: permanent conundrum for dental public health?	Estie Kruger The University of Western Australia
11.30-11.45am	Prioritising public dental care improves self-rated health outcomes	Dominic Keuskamp University of Adelaide
11.45am-12pm	Inequalities in tooth loss distribution: a time-trend analysis in Australia	Sofia Christofis University of Adelaide
12.00-12.15pm	Dental care in small remote towns in Queensland	Leonard Crocombe University of Tasmania, University of Adelaide
12.15-12.30pm	Health promoting role of the oral health therapist	Helen Tane Charles Sturt University

Session 2 *Behavioural, Epidemiologic and Health Services Research 2: Quality of Life Research*
Chairs: Assoc Prof Estie Kruger (University of Western Australia) Location: Auditorium, Level 1
Assoc Prof Leonard Crocombe (Universities of Adelaide and Tasmania)

2.15-2.30pm	Minimum Intervention Dentistry, child oral health-related quality of life and early childhood caries: a non-inferiority randomised control trial	Peter Arrow Western Australia Dental Health Service, University of Adelaide
2.30-2.45pm	Evaluating impacts of third molars experience on QoL using Twitter	Kamal Hanna The University of Adelaide
2.45-3.00pm	Dental health and body mass index among Special Olympics Athletes	Archana Pradhan South Australian Dental Service, Colgate Australian Clinical Dental Research Centre

Session 3 *Behavioural, Epidemiologic and Health Services Research 3: Quality of Life and Workforce Research*
Chairs: Assoc Prof Estie Kruger (University of Western Australia) Location: Auditorium, Level 1
Assoc Prof Leonard Crocombe (Universities of Adelaide and Tasmania)

3.30-3.45pm	Improving Aboriginal Oral Health: A Qualitative Study On Aboriginal Health Workers' Perspectives In Perth, Western Australia	Angela Durey University of Western Australia
3.45-4.00pm	Tooth loss and general quality of life: a population-based study	Dandara Haag The University of Adelaide
4.00-4.15pm	Risk indicators of Chronic Periodontitis in Community Dwelling Elderly Malaysians	Shahrukh Khan University of Malaya
4.15-4.30pm	Root Caries Experience among Australians Adults	Ninuk Hariyani The University of Adelaide, Airlangga University
4.30-4.45pm	Associations between school aspects and child oral and general health	Katie Beckwith The University of Adelaide
4.45-5.00pm	Measuring quality of life outcomes in children with dental caries for use in economic evaluations	Sanjeewa Kularatna Griffith University, Menzies Health Institute Queensland

Tuesday, 25 August

Session 4 *Oral Medicine and Pathology 1: Oral Cancer Research - On the Way to the Clinic* Chair: Dr Haizal Hussaini, University of Otago Location: Auditorium, Level 1

9.45-10.15am

Personalized Patient Care in Oral Oncology

Camile Farah

School of Dentistry and Oral Health Centre of WA,
University of Western Australia

10.15-10.30am

Unfolded protein response gene expression in
oral squamous cell carcinoma

Benedict Seo

University of Otago

Session 5 *Oral Medicine and Pathology 2* Chair: Dr Haizal Hussaini, University of Otago Location: Auditorium, Level 1

11.00-11.15am

Effect of cigarette smoke on oral cells

Hina Narayan

University of Otago

11.15-11.30am

Qualitative analysis of the impact of Oral
Potentially Malignant Disorders on daily life
activities

Jyothi Tadakamadla

Griffith University

11.30-11.45am

Oral cancer amongst Pacific Islanders in New
Zealand from 2000-2010

Ratu Gavidi

Fiji National University

11.45am-12pm

Provision of oral healthcare to cancer patients in
Australia

Narmin Nasr

Adelaide Dental Hospital, University of Adelaide

12.00-12.15pm

The Effects of Zoledronic Acid on VEGF and its
Receptors.

Dawn Coates

University of Otago

12.15-12.30pm

Histomorphometric Outcomes of Periodontal
Regeneration with Multiphasic Scaffold in Sheep

Saso Ivanovski

Griffith University

Sessions 6/7 *Oral Microbiology and Probiotics* Chair: Dr Nick Heng, University of Otago Location: Auditorium, Level 1

2.15-2.45pm

Streptococcus salivarius probiotic solutions for
microbial misdemeanors in the human oral cavity

John Tagg

University of Otago

2.45-3.00pm

The oral microbiota: an untapped source for new
therapeutics

Christina Adler

The University of Sydney

3.30-3.45pm

Overcoming antifungal drug resistance - a new
target

Richard Cannon

Sir John Walsh Research Institute, University of Otago

3.45-4.00pm

A multispecies subgingival biofilm model from
periodontitis and peri-implantitis patients

Mercedes Fernandez y Mostajo

Academic Centre for Dentistry Amsterdam (ACTA)

4.00-4.15pm

Poly-microbial biofilms are *Candida albicans*
strain and morphology dependent

Mohd Hafiz Arzmi

The University of Melbourne, International Islamic
University of Malaysia

4.15-4.30pm	Tooth Mousse® for dental caries - clinical evidence. A systematic review.	Sarah Raphael University of Sydney, Colgate Oral Care
4.30-4.45pm	Is Body Mass Index associated with dental caries? Findings from a sample of Indian school children	Santosh Tadakamadla Griffith University
4.45-5.00pm	Genome sequence of <i>Streptococcus salivarius</i> NCTC 8618 (ATCC 7073T)	Nicholas Heng Sir John Walsh Research Institute, University of Otago

Sessions 8/9

ACODS: Planning for Success in Dental Research

Chair: Professor Boyen Huang, Charles Sturt University Location: Conference Room, Level 2

9.45-10.00am	Introduction of ACODS and our role in research	Chris Peck University of Sydney
10.00-10.30am	Working with industry to fund but also translate/commercialise research	Chris Peck University of Sydney
11.00-11.30am	Dental research as a career	Jonathan Broadbent University of Otago
11.30am-12pm	Setting the scene: the research landscape of ANZ	Camile Farah University of Western Australia
12.00-12.30pm	Question and answer session	Chris Peck, Jonathan Broadbent, Camile Farah

Sessions 10/11

Craniofacial Biology

Chairs: Professor Mauro Farella, University of Otago Location: Conference Room, Level 2
Dr Sarbin Ranjitkar, University of Adelaide

2.15-2.45pm	Modelling oral physiology for clinical diagnostics	Kenji Takada National University of Singapore
2.45-3.00pm	Efficacy of a Mandibular Advancement Appliance on Paediatric Sleep Disordered Breathing: a preliminary report.	Ghassan Idris Sir John Walsh Research Institute, University of Otago
3.30-4.00pm	Dental Development is a Complex Adaptive System affected by environmental stress	Alan Brook University of Adelaide
4.00-4.15pm	A novel model for exploring craniofacial birth defects	Catherine Carleton University of Otago
4.15-4.30pm	Oral Features of Crouzon and Pfeiffer Syndromes	Manjara Packianathan University of Adelaide, Australian Craniofacial Unit
4.30-4.45pm	Growth Factor Expression in the Rat Condyle	Mohamad Al-Dujaili University of Otago
4.45-5.00pm	The long face morphology in genetic syndromes	Azza Al-Ani University of Otago

Wednesday, 26 August

Session 12 *General Dental Research*

Chair: Dr Vincent Bennani, University of Otago

Location: Auditorium, Level 1

9.45-10.15am	Correlation of pressure and displacement during gingival retraction: an <i>in vitro</i> study	Vincent Bennani Sir John Walsh Research Institute, University of Otago
10.15-10.30am	Parental Perception of Oral Health in Pre-School Children	Michael Brosnan University of Otago
10.30-10.45am	Audit of Molar Endodontic Treatment at Fiji National University (2007/2012)	Kritesh Bhai Fiji National University

Session 13 *Behavioural, Epidemiologic and Health Services Research 4*

Chair: Professor Linda Slack-Smith, University of WA

Location: Auditorium, Level 1

11.15-11.30am	Dental experiences of providing dental care to mental health consumers	Linda Slack-Smith University of Western Australia
11.30-11.45am	Theories on social inequalities and oral health: a scoping review	Ankur Singh The University of Adelaide
11.45am-12pm	Longitudinal effects of socioeconomic status on periodontitis: a systematic review	Helena Schuch The University of Adelaide
12.00-12.15pm	Visitor Perceptions of the "Bula Smile" in the Suva Area, Fiji – A Pilot Study	Reginald Kumar Fiji National University
12.15-12.30pm	Is the Bula Smile" important in marketing Eco-tourism in Fiji?"	Temalesi King Fiji National University
12.30-12.45pm	Dentition status & treatment needs of Down's syndrome individuals in Nuku'alofa	Mele Foliaki Fiji National University

Session 14 *Education Research: Best Practices in Clinical Teaching*

Chair: Dr Lee Adam, University of Otago

Location: Conference Room, Level 2

9.45-10.00am	Influence of a tablet-based skills trainer on preclinical restorative skills	Carol Tran University of Queensland
10-10.15am	Self-assessment for a life-long learner	Atieh Sadr Charles Sturt University Dental School
10.15-10.30am	Identifying Threshold Learning Outcomes to shape undergraduate dental curricula	Andrew Flatau Charles Sturt University
10.30-10.45am	Evaluating Team-based Inter-professional Clinical Education in an Australian Dental School	Mark Storrs Griffith University

Session 15 *Biomechanics and Tissue Engineering*

Chair: Associate Professor Neil Waddell, University of Otago

Location: Conference Room, Level 2

11.15-11.30am	Evaluation of the marginal fit of an in-office digitally produced monolithic ceramic crown system	Mirza Baig Charles Sturt University
11.30-11.45am	Accuracy of dental implant positioning as achieved in practice	Orit Oettinger-Barak Melbourne Dental School
11.45am-12pm	Extraction socket healing in humans after ridge preservation techniques: short-term analysis of remodeling pattern comparing use of two types of xenografts	Alessandro Quaranta University of Otago
12.00-12.15pm	Rabbit TMJ osteochondral defect regeneration using TMJ synovial fluid MSCs	Saeed Idrees Kyoto University
12.15-12.30pm	Osteogenic Differentiation of Rabbit Adipose-Derived Stem Cells: A histomorphometry study	Zahra Sarabadani Dental School of Shahed University

Poster sessions

Monday, 24 August – Colgate Poster Competition Session

Colgate Poster Competition entrants will display their posters on Monday in the ODT Gallery from 9am to 5pm. Competition entrants will be judged on Monday in the ODT Gallery and Conference Room, concurrently with the Behavioural, Epidemiologic and Health Services Research sessions in the Auditorium. Competition entrants have 5 minutes to present their poster to the judges, followed by up to 5 minutes of Q&A. Presenters are only required to be present while their posters are being judged.

Posters and presenters will be judged in the following three categories:

- Junior
- Senior, Basic Research
- Senior, Clinical/Preclinical Research

All posters are to be put up in the ODT Gallery in your allotted space by 9am Monday.

During the judging sessions, Junior Competition entrants will be judged in the ODT Gallery, and are asked to be present by their poster at the judging time specified below for their poster.

Senior Competition entrants will be judged in the Conference Room. Entrants are requested to collect their poster from the ODT Gallery and report to the Conference Room with their poster at the time specified below. Once judging is complete, we ask that you return your poster to its allocated space in the ODT Gallery.

If you have any questions, please ask one of the Local Organising Committee.

Junior

Investigation of the effectiveness of D-amino acids to disrupt <i>Enterococcus faecalis</i> biofilms for root canal treatment	Victor Butnejski University of Adelaide	CJ01	11.00am
Three-dimensional high-resolution surface texture analysis of early enamel erosion	Anh Diep University of Adelaide	CJ02	11.10am
The molecular basis of triazole inhibition of an antifungal target	Danyon Graham University of Otago	CJ03	11.20am
Periodontal treatment needs of Down syndrome individuals attending two specialized institutions in Nuku'alofa, Tonga.	James Heimuli Fiji National University	CJ04	11.30am
The effects of the Y chromosome and intrauterine male hormones on human tooth size and shape	Felicity Lam University of Adelaide	CJ05	11.40am
Crown Preparation Parameters Produced by New Zealand Dental Students	Tony Lin University of Otago	CJ06	12.00pm
Extracellular cysteines of <i>Candida albicans</i> Cdr1p affect its efflux-pump function	Joanne Lee University of Otago	CJ07	12.10pm

Percutaneous-exposure-incidents At A Dental Faculty: A Review Of Practice	Muhammad Niazi University of Otago	CJ08	12.20pm
Oral Health Promotion In Lithgow Aged Care Facilities.	Evshen Okan University of Sydney	CJ09	2.20pm
The effect of Smokefree Smiles training on oral health workers	Sindhuja Parthasarathy University of Melbourne	CJ10	2.30pm
Periodontal Disease and Women's health: Awareness and Attitudes of Clinicians	Nathan Phung University of Melbourne	CJ11	2.40pm
Bone healing stimulated by low-intensity pulsed ultrasound (LIPUS) in critical-sized bone defects in rats.	Michael Schenkel Griffith University	CJ12	2.50pm
Oral Health Education in a Justice Health Facility.	Julie Tran University of Sydney	CJ13	3.30pm
Dental treatment need of hearing impaired students attending Gospel school of the deaf Suva, Fiji.	Venina Vokitia Fiji National University	CJ14	3.40pm
Effectiveness of dental students' crown preparations using preparation assessment software	Joyce (Chuan-Chia) Yu University of Otago	CJ15	3.50pm
Perceived dental needs and normative dental needs of hearing impaired adults in San Isidro Disability Center, West Guadalcanal, Honiara, Solomon Islands	Geraldine Pellie Fiji National University	CJ16	4.00pm
Periodontal Status of the Residents of San Isidro Care Center (Auriligo) Guadalcanal Province, Solomon Islands	Rachael Taloni Fiji National University	CJ17	4.10pm
The potential of increased HIV education to change attitudes of JCU dental students towards patients with Human Immunodeficiency Virus (HIV)	James Liu James Cook University	CJ18	4.20pm

Senior, Basic Research (Conference Room)

Primary tooth pulp progenitor cells' charecterisation and differentiation potential	Mohammad Alansary University of Otago	CSB01	11.00am
Keratin hydrogels: rheology and biocompatibility with rat dental pulp	Lavanya Ajay Sharma University of Otago	CSB02	11.10am
Sheep: A suitable model for endodontic regeneration/revitalisation research	Milad Al Taii The University of Adelaide	CSB03	11.20am
Interleukin-17 induces matrix metalloproteinase activation and invasion in oral cancer	Avadhoot Avadhani University of Otago	CSB04	11.30am
A comparison between the effects of a single Parathyroid Hormone (PTH) injection on the healing of stress fractures	Mahmoud Bakr Griffith University	CSB05	11.40am

Pseudomonas quorum sensors significantly enhance fluconazole resistance in Candida albicans.	H.M.H.N. Bandara University of Queensland	CSB06	12.00pm
Nanoengineered protein-delivery system for craniosynostosis therapy	Manpreet Bariana University of Adelaide	CSB07	12.10pm
Periodontal-Pathogen OMVs: immune-stimulants, virulence and risk factors for Chronic Periodontitis.	Jessica Cecil University of Melbourne	CSB08	12.20pm
Antimicrobial activity of silver nanocomposite against oral micro-organisms	Gemma Cotton University of Otago	CSB09	2.20pm
Probiotics Alter Dectin-1-expression and Cytokines-profile in Macrophages Challenged with Candida	Victor Matsubara University of Queensland	CSB10	2.30pm
Effects of Azithromycin on Red Complex Polymicrobial Biofilms	Hweisze (Jillian) Ong Melbourne Dental School	CSB11	2.40pm
The Effect Of Concentrated Growth Factor On Nerve Regeneration	Jie Qin University of Sydney	CSB12	2.50pm
Antimicrobial effect of medical-grade manuka honey against oral bacteria <i>in vitro</i>	Syarida Safii University of Otago	CSB13	3.30pm
Effect of anodized titanium-zirconium implants on osseointegration - a sheep study	Ajay Sharma University of Otago	CSB14	3.40pm
Histomorphometric analysis of zirconia implants in the jaw of sheep	Allauddin Siddiqi University of Otago	CSB15	3.50pm
Inhibition of adhesion of oral bacteria to immortalized human gingival fibroblasts (HGF-1) by tea extracts	Yi Wang University of Queensland	CSB16	4.00pm
A novel scaffold containing calcium polyphosphate and silk fibroin for bone tissue engineering	Huixu Xie James Cook University	CSB17	4.10pm
Effect of Zoledronic Acid on Angiogenic Gene Expression by Osteoclasts	Sobia Zafar University of Otago	CSB18	4.20pm

Senior, Clinical/Pre-Clinical Research (Conference Room)

Soft Tissue Dimensional Changes After Immediate Implant Placement And Restoration	Himanshu Arora Griffith University	CSC01	11.00am
Porcelain Bonding To Novel 3D Printed Cobalt-chromium: A Pilot Study	Abdullah Barazanchi University of Otago	CSC02	11.10am
Intraoral pH and Temperature During Sleep	Joanne Jung Eun Choi University of Otago	CSC03	11.20am

Learning Motor Skills In Dentistry: Comparing Different Approaches	Mohamed El-Kishawi University of Adelaide	CSC04	11.30am
Validation of Quantitative Light-induced Fluorescence-Digital (QLF-D) for quantifying hypomineralised lesions	Karla Gambetta-Tessini University of Melbourne	CSC05	11.40am
Methodologies for measuring the setting times of Mineral Trioxide Aggregate and Portland Cement products	William Ha University of Queensland	CSC06	12.00pm
Bending affects surface and mechanical properties of Stainless-Steel wire	Yan He James Cook University	CSC07	12.10pm
Surface Interface Optimisation of Elastomeric Impression Materials	David Joo University of Queensland	CSC08	12.20pm
Recording of motor units during experimental muscle pain in masseter	Bushra Malik University of Sydney	CSC09	2.20pm
Quality of life changes in pre-school children who underwent treatment for traumatic dental injuries under general anaesthesia.	Chaturi Neboda University of Western Australia	CSC10	2.30pm
Finding support online: peer support in head and neck cancer	Kelsey Pateman University of Queensland	CSC11	2.40pm
A comparison of anesthetic efficacy of combined local anesthetic and ketamine in patients with irreversible pulpitis in the posterior mandibular teeth: a clinical trial.	Vahid Sakhaei Manesh James Cook University	CSC12	2.50pm
Panoramic Radiology. New method of patient instruction reduces palato-glossal airspace	Antonia Scott University of Sydney	CSC13	3.30pm
Proangiogenic therapy as a treatment modality in the management of BRONJ	Chakrabhavi Gundurao Dileep Sharma Griffith University	CSC14	3.40pm
Aetiology of Molar Incisor Hypomineralisation and Hypomineralised Second Primary Molars - A Systematic Review	Mihiri Silva University of Melbourne	CSC15	3.50pm
Experimental and numerical analysis of convergence angles in crown preparations	Janine Tiu University of Otago	CSC16	4.00pm
An evaluation of the change in quality of life of children after dental extraction under general anaesthesia.	Susan Wong University of Western Australia	CSC17	4.10pm

Tuesday, 25 August – General poster session

General (non-Colgate Competition) poster presenters will display their posters on Tuesday in the ODT Gallery from 9am to 5pm. Please put your posters up before 9am in your allocated space.

Perceived Sources of Stress, Burnout, and Coping Strategies among Dental Practitioners in Saudi Arabia	Mohammad Albakry Najran University	GP01
Shear-wave sonoelastography for assessing masseter muscle hardness	Yoshiko Ariji Aichi-Gakuin University School of Dentistry	GP02
Vision: a study of clinical dental teachers	Nicholas Chandler University of Otago	GP03
The periodontal health status of students in a school for the hearing impaired in Suva, Fiji	Octavian Detenamo Fiji National University	GP04
Vital pulp therapy; When, How, Why? - A NZ PBRN study	Lara Friedlander University of Otago	GP05
Microstructured titanium surfaces induce osteoblast paracrine signalling.	Stephen Hamlet Griffith University	GP06
The understanding of Vital Pulp Therapy in a Dental Faculty.	Suzanne Hanlin University of Otago	GP07
Evaluation of a web-based oral health education program at workplace developed with health professionals' feedback: a pilot study	Satoru Haresaku Fukuoka Dental College	GP08
Experimental study on metal artifacts around dental implants	Ryo Hikita Aichi Gakuin University, Medical Corporation Seigando	GP09
Prefrontal cortical hemodynamic response associated with pain in the gingiva	Kyoko Inamoto Aichi Gakuin University	GP10
Salivary gland fat fraction estimated with a new MRI method	Yoshitaka Kise Aichi-Gakuin University	GP11
Ultrastructure and properties of teeth treated using the Hall Technique	Carolina Loch University of Otago, Otago Museum	GP13
DNA methylation status of VEGF-A, HIF-1a and BMP-2 in gingival tissue of smokers.	Trudy Milne Sir John Walsh Research Institute	GP14
Eyesight: a study of dental students during their clinical training	Colleen Murray University of Otago	GP15

Practice, Availability and Knowledge of Oral Hygiene Aides amongst the Health Care Professionals of St Giles Hospital, Fiji	Nushrat Nisha Fiji National University	GP16
Understanding responses to Likert options used in P-CPQ-16 and FIS-8	Norhasnida Nordin University of Otago, Universiti Teknologi MARA	GP17
Human bone segmentation methods comparison using MicroCT images	Karla Rovaris Faculty of Dentistry - UNICAMP	GP19
Time-dependent changes in prefrontal cortex activity during tooth clenching	Shigemitsu Sakuma Aichi Gakuin University	GP20
Preventing biofilm formation by exposure of oral bacteria to silver nanoparticles	Donald Schwass University of Otago	GP21
Survey of digital panoramic radiographs: quality assessment, faults and pathology	Amelita Simpson University of Sydney, Sydney Dental Hospital	GP22
Efficacy and time kill assay of 0.05% cetylpyridinium chloride mouth rinse	Patcharawan Srisilapanan Chiang Mai University	GP23
Community Pharmacists' Knowledge Regarding Dry Mouth	Margaret Stacey The University of Melbourne	GP24
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Effect of TGF- β 1 on osteoclast precursors in the bone microenvironment	Joji Tamaoka Hyogo College of Medicine	GP27
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Research abstracts

Abstracts are listed alphabetically, by presentation type.

Abstracts from oral presentations

Abstract ID: 2341368

The oral microbiota: an untapped source for new therapeutics

Christina Adler

The University of Sydney

Nominated IADR Scientific Category: Craniofacial Biology

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Keywords: Caries, Microbiota, Metagenomics, Genetics.

Presenting in Session 6 - Oral Microbiology & Probiotics 1, Tue 2.45-3.00pm

Objectives: Recent advances in genetic techniques have revealed that the oral cavity is home to a huge diversity of bacteria, with microbial genes outnumbering human genes by more than 100-fold. Deep genetic sequencing of the oral microbiota in health and dental caries is providing a previously untapped source from which to develop new therapeutics to this common disease. This presentation will review deep sequencing techniques and how they can be used to mine for therapeutic information.

Methods: The two most common approaches to genomic analysis of the oral microbiota are sequencing of the 16S rRNA gene and shotgun sequencing of nearly all the genetic material in a sample, which is called metagenomics. The 16S approach is used to answer the question of 'who's there' in the oral microbiota in health and caries, whereas metagenomic sequencing is used to answer the question 'what are they doing'.

Results: Use of the 16S approach to compare the oral microbiota in health and caries can be used to identify health-causing bacteria that could be used as probiotics. Health promoting oral probiotics has the potential to prevent a cariogenic microbial community establishing. Metagenomic sequencing can be used to create a gene catalogue of the oral microbiota. This gene catalogue will show how the oral microbial community functions

differently between oral health and dental caries. The oral microbiota gene catalogue could be used to search for genes that provide natural antibiotic activity against caries causing bacteria.

Conclusions: The use of genetic sequencing to search for new therapeutics to prevent dental caries will potentially assist to reduce the prevalence of this disease, increase access to treatment by providing low cost alternatives and assist in the reduction of antibiotic resistance, by possibly leading to the development of new antimicrobials.

Abstract ID: 2344060

The long face morphology in genetic syndromes

Azza Al-Ani

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Nominated IADR Scientific Category: Craniofacial Biology

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Keywords: long face, morphology, genetic, syndromes, review.

Presenting in Session 11 - Craniofacial Biology 2, Tue 4.45-5.00pm

Objectives: The long face morphology is a multifactorial trait, with a significant genetic component. Nonetheless, very few genes involved in the morphogenesis of this trait have been identified thus far. Recent research suggests that some of the causative genes involved in genetic syndromes may also influence facial morphology in normal populations. To identify potential candidate genes of the long face morphology (LFM) by searching the literature for well-characterised syndromic conditions that present with increased vertical facial height.

Methods: A targeted search of the PubMed, Embase and Scopus databases using relevant Medical Subject Headings was undertaken. Articles published from 1966 to April 2013

were included in the review. The selection criteria required that these studies (1) were written in the English language (2) were relevant to the objective and (3) included extra-oral photographs. Three independent orthodontists identified whether the syndrome(s) exhibited the long face morphology or not. The three observers applied the inclusion criteria separately. In case of disagreement, a consensus decision was made - see Figure 1.

Results: The articles identified included case reports, case series, family and twin studies. The initial search yielded 120 studies. After exclusion of irrelevant titles and abstracts, 100 full-text articles were assessed for eligibility. Application of the inclusion criteria resulted in 24 eligible publications. Twenty-two conditions were identified to be associated with the LFM including Cri-du-chat (OMIM 123450, 5p15.2), Fragile X (OMIM 300624, Xq27.3) and Marfan syndromes (OMIM 154700, 15q21.1) - see Figure 2.

Conclusions: A number of well-characterised genetic syndromes were found to be associated with increased vertical facial height, suggesting there may be an association between the genes involved in these syndromes and the long face phenotype. Six of the 16 syndromes, whose chromosome location was known, were found to be X-linked. Future genetic studies investigating the aetiology of the LFM should therefore investigate these candidate genes further.

Abstract ID: 2343962

Growth Factor Expression in the Rat Condyle

Mohamad Al-Dujaili

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Nominated IADR Scientific Category: Craniofacial Biology

Authors/Institutions: M. Al-Dujaili, M. Farella, T. Milne, R. Cannon, Oral Sciences, Faculty of Dentistry, University of Otago, Dunedin, NEW ZEALAND

Keywords: growth factor, condyle, mandible.

Presenting in Session 11 - Craniofacial Biology 2, Tue 4.30-4.45pm

Objectives: The mandible is particularly important in growth and development, in that it contributes to the morphology of the face. From a clinical perspective, mandibular morphologies may be attributed to certain malocclusions.

The mandibular condylar cartilage has gained a long-standing interest in orthodontic research, as it is a site of growth and development of the mandible. The initial aim was to extract RNA from the condylar tissue. The main purpose of the experiment was to assess an array of growth factors and to appraise the changes in regulation, over several time points.

Methods: This study was carried out in two parts. A pilot study involving 6 rats was used to validate 1) a surgical method for the harvesting the rat condyle 2) a protocol for the extraction of RNA, following cryogenic grinding of the condyle and 3) using Haematoxylin and Eosinophil and Toluidine Blue stains, different developmentally distinct time points were identified. In the main study, 72 condyles were extracted, and processed through the validated RNA extraction protocol. The remaining eight condyles were assigned for further histological analysis. The level of mRNA obtained and the gene expression for 28 growth factor genes were measured. Quantitative Polymerase Chain Reaction (qPCR) technique was used to compare the relative gene expression at the time points identified.

Results: The condylar tissue harvesting technique, the cryogenic grinding protocol and RNA extraction methods were all successfully carried out. In all the samples, the 28 genes investigated were found to be expressed. Across all time points and relative to the three internal normalisation genes, there was subtle up and down regulation of genes involved in chondrogenesis and osteogenesis. However, the recommended two-fold change was not apparent for any of these growth factor genes ($-3.85 \leq \text{fold change} \leq 1.65$; $p \geq 0.07$).

Conclusions: The present study showed that the cryogenic grinding protocol was a valid technique in extracting RNA from the condyles and that all the growth factors selected were present in the gene analysis. However, in the rat model, the twofold change in the regulation did not occur for any of the growth factors investigated at any time point selected.

Abstract ID: 2288361

Minimum Intervention Dentistry, child oral health-related quality of life and early childhood caries: a non-inferiority randomised control trial

Peter Arrow

Western Australia Dental Health Service, University of Adelaide

Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

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Keywords: child oral health-related quality of life, atraumatic restorative treatment.

Presenting in Session 2 - BE&HSR 2: Quality of Life Research, Mon 2.15-2.30pm

Objectives: To evaluate changes in child oral health-related quality of life (COHRQoL) after treatment for early childhood caries (ECC), comparing the Minimum Intervention Dentistry (MID) approach, based on the atraumatic restorative treatment procedures (MID-ART: Test), against the standard care approach (Control).

Methods: A pragmatic, two-arm, non-inferiority randomised control trial conducted in the public dental service in Perth, Western Australia. Consenting parent/child dyads with ECC were randomly allocated to Test or Control. Participating parents completed the Early Childhood Oral Health Impact Scale (ECOHIS) at baseline and follow-up. Dental therapists provided treatment to the Test and dentists/dental therapists treated the Control. The outcome was the change in ECOHIS scores and prevalence of COHRQoL impacts. Data were analysed on an intention to treat basis using the chi-squared statistic for groups, Wilcoxon's test (rank-sum test and matched-pairs signed-rank test), and unpaired t-test.

Results: 273 children were examined at baseline and 254 were randomised, (Test=127; Control=127). Thirty-four children reported no impacts at baseline, mean ECOHIS score, 11.1, sd 8.2, age=3.8yrs, sd 0.90; 59% male, mean dmft=4.9, sd 4.0. There were no statistically significant

differences in COHRQoL, age, sex, and caries experience at base-line between Test and Control. At follow-up (mean interval 11.4 months, sd 3.1 months) 210 children returned a completed questionnaire; Test=111, Control=99. There were significant decreases in the number of impacts overall at follow-up in the child, family and total ECOHIS, and in the two treatment groups, Wilcoxon signed-rank test, $p < 0.05$. There was no significant difference in changes in COHRQoL between Test and Control from baseline to follow-up; change Test=1.3, sd 6.3; Control=2.0, sd 8.8, Wilcoxon rank-sum test, $p = 0.48$

Conclusions: COHRQoL improved with dental care using the MID-ART approach, and there was no statistically significant difference between Test and Control in the extent of the improvement.

Abstract ID: 2335821

Poly-microbial biofilms are *Candida albicans* strain and morphology dependent

Mohd Hafiz Arzmi

The University of Melbourne and International Islamic University of Malaysia

Nominated IADR Scientific Category: Cariology Research - Microbiological Studies / Biofilm

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Keywords: Biofilms, Crystal violet assay, XTT assay.

Presenting in Session 7 - Oral Microbiology & Probiotics 2, Tue 4.00-4.15pm

Objectives: Oral biofilms are formed by various microorganisms such as *C. albicans*, *Actinomyces naeslundii* and *Streptococcus mutans*. Biofilm forming ability is one of the virulent factors of *C. albicans* and this may be involved oral carcinogenesis. Our objective was to assess *C. albicans*, *A. naeslundii* and *S. mutans* interaction in the formation of poly-microbial biofilms.

Methods: Four *C. albicans* ATCC strains (32354, MYA-2876, 90234, and 18804), two HIV isolates (genotype-A and

genotype-B), two oral cancer isolates (OC1 and OC2), *A. naeslundii* (NCTC 10301) and *S. mutans* (Ingbritt) were used in this study. To study intra-kingdom biofilm formation, 24 h culture of *C. albicans*, *A. naeslundii* and *S. mutans* grown in Sabouraud's dextrose agar, blood agar and Todd-Hewitt yeast extract agar, respectively, were suspended in artificial saliva medium (ASM) or RPMI-1640 to give 106 cells mL⁻¹, 107 cells mL⁻¹ and 108 cells mL⁻¹, respectively in the well of 96-well plate and incubated for 72 h at 37°C. Subsequently, biofilm was stained with crystal violet or XTT to measure biomass and metabolic activity, respectively, and the absorbance at 620nm wavelength was measured. To study inter-kingdom biofilms, the same protocol was repeated, except combinations of microorganisms were inoculated in a same well.

Results: Growth of *C. albicans* was predominantly by yeast and hyphal form when grown in ASM and RPMI-1640, respectively. Biofilm biomass of *C. albicans* co-cultured with *A. naeslundii* and/or *S. mutans* was *C. albicans* strain and morphology dependent. More often high biofilm biomass (HBB) observed in ASM-grown biofilm (43.7%), and more often high metabolic activity (HMA) was observed in RPMI-grown biofilm (65.6%).

Conclusions: This study demonstrates that inter-kingdom biofilm biomass and metabolic activity of *C. albicans*, *A. naeslundii* and *S. mutans* is dependent on the strain and morphological form of *C. albicans*.

Abstract ID: 2338399

Evaluation of the marginal fit of an in-office digitally produced monolithic ceramic crown system

Mirza Baig

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Nominated IADR Scientific Category: Prosthodontics Research

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Keywords: Dental marginal adaptation, Ceramics, CAD-CAM, CEREC, Digital scan.

Presenting in Session 15 - Biomechanics and Tissue Engineering, Wed 11.15-11.30am

Objectives: To investigate marginal accuracy of CEREC 3D (Chairside economical restoration of esthetic ceramics) crowns, in terms of gap and overhang, and to compare them with complete metal crowns. The effect of margin configuration on marginal fit was also evaluated.

Methods: Twenty virtual models were obtained from master metal premolar dies, ten each for shoulder and chamfer, respectively, by scanning with Bluecam intra-oral scanner (n=10). Twenty Type IV dental stone dies were also prepared from impressions made of metal dies, ten each for shoulder and chamfer. Monolithic ceramic crowns were designed and milled for each virtual model, for the two test groups (n=10). Complete metal (Noble Type IV alloy) crowns were also fabricated on the stone dies. In total, 40 crowns were made- 10 ceramic shoulder, 10 ceramic chamfer, 10 metal shoulder, and 10 metal chamfer. The crowns were subjected to marginal gap and overhang evaluation at six designated margin locations using a computerised digital image analysis system. The influence of material and finish line on marginal fit of crowns were statistically evaluated using MANOVA (Multiple analysis of variance) test ($\alpha = 0.05$).

Results: The overall mean(SD) marginal gaps and overhangs for the CEREC crowns, were 172(51) μ m and 77(61) μ m for Shoulder, and, 132(50) μ m and 40(59) μ m for Chamfer, respectively. The values for the complete metal crowns were 36(20) μ m and 27(25) μ m for Shoulder, and, 37(24) μ m and 34(36) μ m for Chamfer. The MANOVA test found significant differences ($P < 0.05$), between Cerec and Metal, in terms of gap and overhang, for both shoulder and chamfer. MANOVA analysis for gap, comparing shoulder and chamfer, showed non-significant differences for Metal ($P > 0.05$) and significant differences for CEREC ($P < 0.05$), whereas for the overhang, both Metal and CEREC showed significant differences between shoulder and chamfer ($P < 0.05$).

Conclusions: Chamfer margin preparations seemed to produce better marginal accuracy compared to Shoulder, for CEREC 3D crowns.

Abstract ID: 2343067

Associations between school aspects and child oral and general health

Katie Beckwith

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

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Keywords: Dental Health Surveys, Schools, Social Environment, Children.

Presenting in Session 3 - BE&HSR 3: Quality of Life and Workforce Research, Mon 4.30-4.45pm

Objectives: Schooling forms a large part of a child's life experience and characteristics of schools have been associated with various health outcomes. The association between aspects of schools and child oral and general health outcomes were assessed for a sample of children from NSW, SA and ACT.

Methods: Parents of a random sample of 3,044 children aged 9-14 years responded to self-complete surveys. Parents rated child's oral and general health on 5-point Likert-type scales, dichotomised to good/fair/poor vs excellent/very good. Parent perceptions of their child's school were also collected. Administrative data were collected from the MySchool website for participating schools. Multilevel, multivariate logistic regression analyses were conducted on parent ratings of good/fair/poor child oral health and general health, using child sociodemographic information, MySchool school information and parent perception of schools at the individual (collected) level and at the school level (amalgamated).

Results: Reference models showed a significant school-level variance in child general (Median Odds Ratio 1.41) and oral health (MOR 1.18). After controlling for all other variables, a good/fair/poor rating of child general health was associated negatively with parent perceptions of the school social environment (Odds Ratio 0.59 good, 0.41 good-medium vs poor). For child oral health, a good/fair/poor rating was associated negatively with parent perceptions of the school at the individual level; social environment (OR 0.70 good, 0.59 good-medium vs poor), health promoting environment

(OR 0.70 good vs poor), quality of buildings/grounds (OR 0.70 good vs poor) and quality of teachers (OR 0.70 medium vs poor). A school-level variable, relations, was also negatively associated with good/fair/poor child oral health (OR 0.59 good vs poor).

Conclusions: There was significant variation across schools in parent-rated child oral and general health. School aspects were associated with parental perceptions of child general and oral health, controlling for individual level factors.

Abstract ID: 2281178

Correlation of pressure and displacement during gingival retraction: an *in vitro* study

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Nominated IADR Scientific Category: Prosthodontics Research

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Keywords: Gingival displacement, retraction cord, retraction paste, pressure, correlation pressure and displacement.

Presenting in Session 12 - General Dental Research, Wed 09.45-10.15am

Objectives: There are numerous gingival displacement materials on the market; however, there is limited information available regarding the pressures that can atraumatically produce sufficient gingival displacement for a successful impression. This study uses an innovative model to measure pressure and the resulting movement of artificial gingiva. Methods: Material and methods. An idealised tooth model was made from acrylic, and vinyl polysiloxane was used to simulate the free gingiva, sulcus, and attachment. The pressure and displacement achieved by three materials (Expasyl, Expasyl New, and KnitTrax Cord) was measured. A stereoscopic digital measuring microscope was used to quantify the space generated by the displacement material. A pressure gauge was used to measure the corresponding

pressures, while Chart 5 software using a Power Lab system recorded the data.

Results: Injection of Expasyl resulted in a retraction distance of 1.31 mm, Expasyl New produced 1.07 mm, and placement of KnitTrax Cord generated a 0.85 mm, which mirrors an ideal clinical outcome. The correlation between pressure and gap identified that Expasyl and Expasyl New behaved similarly while the KnitTrax Cord was different. Expasyl, Expasyl New and KnitTrax Cord all had maximum pressures that would be considered to be atraumatic to the epithelium attachment.

Conclusions: An increase in pressure resulted in an increase in displacement for the two paste materials; however, contrary to expectation, there was a decrease in displacement as pressure increased for the KnitTrax Cord. All retraction materials produced similar pressures below traumatic levels.

Abstract ID: 2322648

Audit of Molar Endodontic Treatment at Fiji National University (2007/2012)

Kritesh Bhai

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Nominated IADR Scientific Category: Education Research

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Keywords: endodontics , audit , students , radiographs.

Presenting in Session 12 - General Dental Research, Wed 10.30-10.45am

Objectives: An audit to identify statement of correct diagnosis using current terminology, assessment of radiographic records and determination of its diagnostic value and establishing if root canal treatment initiated was completed. Methods: A retrospective study where patient folders from 2007 and 2012 were extracted and data collection done by auditing folders which included – diagnosis, stabilization, working length, canal prep and obturation phases, final restoration placed, quality of radiographs and overall treatment.

Results: Total of 47 patients in 2007 and 30 in 2012 were seen. In 2007, 39% cases did not state status of pulp and root canal compared to 2012 (6%). In 2007, 96% did not state periapical status compared to 2012 (6%). 100% of cases in 2012 recorded cause of endodontic treatment compared to 2007 (27%). Leading cause of seeking endodontic treatment was caries (2007-43%, 2012-69%) followed by failed restoration (2007-25%, 2012-31%). 2007 had a higher percentage of treatment completed (90%) compared to 2012 (40%).

In 2007, 25 pre-operative radiographs were present (64% had good diagnostic quality). All radiographs had correct placement of emboss dot and were correctly mounted. 8 were correctly labeled. All 14 post-operative radiographs had correct placement of emboss dot. 9/14 were of good diagnostic quality and 13 were correctly mounted.

In 2012, 90% of pre-operative radiographs had correct placement of emboss dot (86% were of good diagnostic value). 28 were correctly mounted while 20 were correctly labelled. Out of the 13 completed root canal treatments, 7 final radiographs were present (100% had good diagnostic quality). All were correctly mounted with emboss dot at their correct positions. 6 /7 radiographs were correctly labelled.

Conclusions: This is the first phase of a long-term research project which aims to gauge success of endodontic treatment provided by students. The success of the endodontic treatment will be assessed clinically, radiographically and by provision of questionnaires to participants in the second phase of the research.

Abstract ID: 2343078

Dental Development is a Complex Adaptive System affected by environmental stress

Alan Brook

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Nominated IADR Scientific Category: Craniofacial Biology

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Keywords: growth and development, genetics, environment, dentition, defects.

Presenting in Session 11 - Craniofacial Biology 2, Tue 3.30-4.00pm

Objectives: The development of the dentition is a valuable paradigm for general development. It displays the characteristics of a Complex Adaptive System and is a permanent record of major influences during its development. Our aims are to investigate dental developmental outcomes in a group of Romano-Britons subjected to substantial environmental stress, to compare these findings with those of Modern Britons and to consider possible mechanisms for any differences.

Methods: The excavated material of Romano-Britons from Poundbury, U.K. contains 486 intact jaws, subsamples from which were used in the four aspects studied. Visual examinations were made for tooth number and enamel hypoplastic defects. For crown diameters manual measurements were made using dial callipers. Six standardised radiographs covered the dentition of each individual. From these radiographs, the number of teeth present was confirmed and the root number, size and shape was scored. The same criteria were used in Modern Britons.

Results: In comparison with Modern Britons, the Romano-Britons had the same types of dental developmental defects; the same sexual dimorphisms in tooth number, size and shape and prevalence of their variations; threefold greater prevalence of hypodontia and microdontia; smaller crown size, root size and root shape; and threefold greater prevalence of enamel hypoplasia.

Conclusions: The findings for Romano- Britons probably resulted from severe environmental stress from high lead ingestion, poor nutrition with vitamin and mineral deficiencies, and recurrent infections affecting the whole dental development. These environmental agents may have acted in a summative or even synergistic manner. In addition to direct effects on tooth molecular and cellular processes, they may have affected the immune and endocrine systems and produced epigenetic changes. These findings have relevance for modern populations suffering environmental stress and emphasise the value of studying the dentition as a Complex Adaptive System and a model for general development.

Abstract ID: 2330047

Parental Perception of Oral Health in Pre-School Children

Michael Brosnan

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Nominated IADR Scientific Category: Pediatric Oral Health Research

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Keywords: Parental perceptions, Preschool children, Oral Health.

Presenting in Session 12 - General Dental Research, Wed 10.15-10.30am

Objectives: This study was carried out to investigate parental knowledge regarding maintaining oral health in pre- school children.

Methods: A questionnaire containing 14 items was prepared. The questions asked for basic information regarding the child such as age, sex and number of siblings, parents' understanding of primary teeth, parents' knowledge of caries formation and ways to prevent caries as well as how they received this information.

Results: Results showed that parents are aware of the importance of tooth brushing and the need to limit sugar intake amongst many other ways to prevent caries. However, it is not well known to parents that the frequency of intake is the most important factor in sugar consumption and that fluoride plays a huge role in caries prevention.

Conclusions: Available oral health care information, especially those given by oral health practitioners need to be more accurate where sugar consumption is involved. Parents need to better understand that it is the frequency of consumption that results in high caries risk. It was a misconception by the parents that they need to completely avoid giving sweets to their children. More information should also be provided to parents in assisting tooth brushing.

Abstract ID: 2334952

Overcoming antifungal drug resistance - a new target

Richard Cannon

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Nominated IADR Scientific Category: Microbiology / Immunology

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Keywords: *Candida albicans*, drug resistance.

Presenting in Session 7 - Oral Microbiology & Probiotics 2, Tue 3.30-3.45pm

Objectives: There is heightened global awareness of the threat posed by the antibiotic resistance of bacteria. A lesser threat is presented by antifungal drug resistance, but azole resistance in *Candida albicans* is still a clinical concern for certain patient groups. A major mechanism of azole resistance in *C. albicans* is drug efflux from cells by plasma membrane-bound ATP-binding cassette (ABC) proteins. We have demonstrated that the *C. albicans* ABC protein Cdr1p can be targeted to overcome azole resistance. Cdr1p contains two large extracellular loops, EL3 and EL6, that are highly conserved amongst a sub-family of ABC proteins. EL3 contains two conserved motifs, PDRA and PDRB, and EL6 contains the conserved EL6 motif and EL6 helix. The objective of this research was to determine the role of conserved EL3 and EL6 amino acids in Cdr1p pump function.

Methods: Individual amino acids of the conserved motifs were replaced with alanine by site-directed mutagenesis and the Cdr1p variants cloned into the heterologous expression host *Saccharomyces cerevisiae* AD Δ Δ . GFP-tagged Cdr1p variants were tested for sensitivity to different antifungals, and Cdr1p-GFP expression and localization were examined by SDS polyacrylamide gel electrophoresis analysis and confocal microscopy.

Results: All Cdr1p variants were expressed in *S. cerevisiae*, although Cdr1p-GFP was mislocalized in some mutants, such as N691A and E704A. Alanine substitution did not affect the resistance conferred on *S. cerevisiae* by Cdr1p for many variants, but some conferred up to 32-fold less fluconazole resistance. The results indicated that the invariable W683 and W686 amino acids of the PDRA alpha-helix may interact

directly with the invariable W1374 and F1376 of the EL6 motif beta-sheet during the Cdr1p transport cycle.

Conclusions: The highly conserved motifs in external loops EL3 and EL6 of Cdr1p appear to form a lid that is critical for Cdr1p pump function and could be a target for drug development.

Abstract ID: 2343906

A novel model for exploring craniofacial birth defects

Catherine Carleton

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Nominated IADR Scientific Category: Craniofacial Biology

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Keywords: Congenital abnormalities, Zebrafish.

Presenting in Session 11 - Craniofacial Biology 2, Tue 4.00-4.15pm

Objectives: Previous research has shown that the oxidative stress-inducing compound auranofin (AFN) may cause craniofacial cartilage defects in zebrafish embryos. The aim of this study is to determine how genetic and environmental causes of craniofacial birth defects affect the growth and survival of cells contributing to the craniofacial skeleton during embryo development. Using a zebrafish model, we want to determine whether factors that enhance cell survival can actually rescue craniofacial defects.

Methods: AFN was applied to zebrafish embryos and the resulting cartilaginous phenotype was characterised at 5 days post-fertilisation (dpf) using light microscopy. To determine whether craniofacial defects were due to cell death, we used terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) staining. Photos were taken of embryos at different timepoints and AFN concentrations, to see if there was a difference in the number of cells stained. An antioxidant, RiboCeine (RBC), was added in conjunction with AFN to investigate whether the phenotype produced by applying AFN can be rescued by antioxidants via promoting

cell survival. The resulting phenotypes were characterised at 5 dpf using light microscopy.

Results: Application of AFN caused defects in craniofacial cartilage of 5 dpf zebrafish embryos. Higher doses of AFN led to greater numbers of TUNEL-positive cells, therefore the craniofacial defects observed are likely due to cell death. Dying cells probably include those of neural crest origin, since these are the primary source of the craniofacial skeleton. Strikingly, RBC consistently 'rescued' the jaw-defect phenotype caused by the the application of AFN. Conclusions: An antioxidant, RBC, can rescue craniofacial cartilage defects caused by the oxidizing agent AFN in a zebrafish model, and may have translational significance. Indeed, treatment with antioxidants may help to prevent craniofacial defects in children, especially in families where there is an identified genetic or environmental risk.

Abstract ID: 2329096

Inequalities in tooth loss distribution: a time-trend analysis in Australia

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University of Adelaide

Nominated IADR Scientific Category: Global Oral Health Inequalities Research Network

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Keywords: Tooth loss, oral health , inequalities, Australian adults, time trend.

Presenting in Session 1 - BE&HSR 1: Epidemiology, Economics and Inequalities, Mon 11.45am-12.00pm

Objectives: Tooth loss is declining in Australia; however the time-trend of tooth loss for Australian subgroups is unknown. This study aims to investigate trends of tooth loss for Australian adults (≥ 18 years) according to sociodemographic characteristics.

Methods: Prevalences of edentulism and functional dentition (≥ 21 teeth) by age group, area-based relative disadvantage (IRSD), geographic remoteness (ASGC) and time exposure of water fluoridation were estimated from the Australian National Dental Telephone Interview Surveys (NDTIS) from 1994 to 2010 ($n=6,187-13,654$). Time-trend

analysis used Prais-Winsten generalized linear regression to estimate the average annual percent change (AAPC). Results: The prevalence of edentulism decreased (from 13.7% to 5.9%), while the prevalence of functional dentition increased (from 72.2% to 83.7%) in the study period. Edentulism halved for people aged over 65 (from 41.9% to 22.5%) and decreased in both disadvantaged and advantaged areas (from 17.4% to 8.5%, and 8.0% to 5.0%, respectively). Downward AAPCs for edentulism occurred for all age groups, increasing in magnitude with age (23.2% for aged over 65); all IRSDs (most disadvantaged: 4.3%, middle 5.9%, most advantaged: 4.8%); Major Cities (5.8%); no fluoridation: 4.3%; and over thirty years fluoridation (7.9%). The prevalence of functional dentitions increased for areas of disadvantage (from 67.6% to 77.1%); advantage (from 81.5% to 86.8%); and Major Cities (from 77.2% to 86.1%); Inner Regional areas (from 69.2% to 78.7%); and fluoridation (unfluoridated from 71.3% to 78.6%; under thirty years fluoridation from 76.5% to 82.9%; longstanding fluoridation from 65.4 to 85.2%). Positive AAPCs in functional dentitions occurred for all age groups (0.1% to 2.9%); middle IRSDs (1.5%), Major Cities (0.8%); Inner Regional areas (1.9%); and longstanding fluoridation areas (1.5%).

Conclusions: Despite a significant decrease and increase in the proportion of tooth loss and functional dentitions, respectively, over time, socioeconomic and demographic inequalities in tooth loss remain in Australia.

Abstract ID: 2343432

The Effects of Zoledronic Acid on VEGF and its Receptors

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University of Otago

Nominated IADR Scientific Category: Periodontal Research - Pathogenesis

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Keywords: Angiogenic factor, Bisphosphonate-Related Osteonecrosis of the Jaw, Vascular Endothelial Growth Factor-A.

Presenting in Session 5 - Oral Medicine and Pathology 2, Tue 12.00-12.15pm

Objectives: This research investigated the regulation of VEGFR1/2 in primary human alveolar osteoblasts and the effects of zoledronic acid (ZA) and the Mevalonate Pathway (MVP) intermediate geranylgeraniol (GGOH) on VEGF and VEGFR1 expression.

Methods: Primary cultures of human alveolar osteoblasts (HOB; n=3) were isolated and phenotyped. Selective inhibitors of the VEGF receptors were ZM306416 for VEGFR1 and ZM323881 (Selleckchem) for VEGFR2. Their effect on osteoblast maturation was measured. The effects of ZA with and without GGOH, were investigated on the gene expression of VEGF and VEGFR1/R2 using quantitative real-time PCR conducted with Taqman (Life Technologies) on a QuantStudio 6 Flex qPCR instrument (Applied Biosystems). Fold regulation was calculated using the formula $2^{-\Delta\Delta Cq}$. VEGF protein was quantified using an ELISA (R&D Systems) and VEGFR1 protein with immunocytochemistry.

Results: VEGFR1 but not VEGFR2 inhibition significantly reduced the deposition of calcium during osteoblast differentiation. ZA with 48 hrs of exposure on primary osteoblasts significantly upregulated VEGF mRNA (FR= 3.0, p-value=0.04) and protein (145% of control, p=0.0075). VEGFR1 protein was present on osteoblasts as they matured. **Conclusions:** The antiangiogenic effects of ZA do not appear to be mediated via VEGFA protein availability. MVP replacement with GGOH was found to partially reverse the effects of ZA on VEGF expression. Selective use of the VEGFR1 but not the VEGFR2 receptor was indicated by inhibitor studies. VEGFR1 mRNA was present in primary alveolar osteoblasts and protein expressed during differentiation. We are currently investigating the VEGFR1 protein processing in the presence of ZA.

Abstract ID: 2331236

Dental care in small remote towns in Queensland

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Nominated IADR Scientific Category: Network for Practice - based Research

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Keywords: primary care providers, rural , remote, dental, dentist.

Presenting in Session 1 - BE&HSR 1: Epidemiology, Economics and Inequalities, Mon 12.00-12.15pm

Objectives: To investigate the views and experiences of non-dental care providers with oral health service provision in Queensland rural/remote communities that do not have a resident dentist.

Methods: Thirty-five primary and four dental care providers in four remote communities in outback Queensland were interviewed using semi-structured interviews. Content and thematic data analysis was undertaken using Nvivo. **Results:** In the absence of a resident dentist, rural and remote residents presented to non-dental primary care providers with oral health problems such as toothache, abscess, oral/gum infection and sore mouth for treatment and advice. Themes emerged from the interview data around communication challenges and strategies to improve oral health. Although, non-dental care providers commonly advised patients to see a dentist, they rarely communicated with the dentist in the nearest regional town. Participants proposed that oral health could be improved by: enabling access to dental practitioners, educating communities on preventive oral health care and building the skills and knowledge base of non-dental primary care providers in the field of oral health.

Conclusions: Prevention is a cornerstone to better oral health in rural and remote communities. Strategies to improve the provision of dental services by visiting or resident dental practitioners should include community based oral health promotion activities and closer engagement with other primary care service providers in the small communities.

Abstract ID: 2338779

Improving Aboriginal Oral Health: A Qualitative Study On Aboriginal Health Workers' Perspectives In Perth, Western Australia

Angela Durey

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

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Keywords: Indigenous, oral health , dental services.

Presenting in Session 3 - BE&HSR 3: Quality of Life and Workforce Research, Mon 3.30-3.45pm

Objectives: The main objective of this qualitative study was to identify Aboriginal Health Workers' (AHWs) perspectives on ways to improve oral health in the Aboriginal community in Perth Western Australia

Methods: Ethics approval was granted to conduct semi-structured interviews and focus groups with 35 AHWs across 13 sites in Perth. A line by line independent analysis of initial transcripts by two researchers were compared, discussed, reviewed and summarised for key themes related to factors enabling oral health in the Perth Aboriginal community

Results: Promoting oral health education from pregnancy across the life span was a key theme where a one-size-fits-all approach to dissemination was replaced with presenting culturally relevant information that was innovative, affordable, interactive and reached all sectors of the community. Other suggestions for improvement included free oral health services for 0-4 year olds, ensuring dental services were respectful of Aboriginal people, inter-professional practice with oral health included in general health checks, encouraging trans-generational role modelling of good oral health practice in Aboriginal families and employing community based Aboriginal oral health liaison officers. **Conclusions:** AHWs' suggestions for improvement to implement a more flexible and culturally appropriate approach to education, prevention and treatment requires critical review of current practices for whether they promote oral health outcomes for Aboriginal people. This offers an opportunity for Aboriginal and non-Aboriginal stakeholders to work together to develop and implement policies and practices that are well- resourced and translate into sustained improvements to oral health outcomes for Aboriginal people.

Abstract ID: 2353414

Personalized Patient Care in Oral Oncology

Camile Farah

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Nominated IADR Scientific Category: Oral Medicine & Pathology

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Keywords: personalized medicine, oral cancer, next generation sequencing.

Presenting in Session 4 - Oral Medicine and Pathology 1: Oral Cancer Research - On the Way to the Clinic, Tue 09.45-10.15am

Objectives: Advances in the management of patients with head and neck cancer (HNC) have not significantly changed the prognosis of this group of tumours over the past five decades. Molecular heterogeneity of HNC and its association with HPV, in addition to the increase in the number of cancers arising in traditionally low-risk patients, are among some of the obstacles to successful management of this group of tumours.

Methods: Massively parallel sequencing, also known as next generation sequencing (NGS), is rapidly changing conventional patient management by providing detailed information about patients' genome and transcriptome. **Results:** The arrival of NGS technologies in diagnostic laboratories heralds an opportunity for uncovering driver mutations in HNC, understanding of disease stratification, personalisation of treatment strategies within the framework of genomic medicine, and discovery of potential druggable targets for disease-specific treatment.

Conclusions: Personalized medicine customizes health care based on an individual's unique environment, clinical profile, and genetics. The next generation of clinicians will be expected to personalize their management according to the molecular profiles of their patients. This session will discuss the clinical application and utilization of NGS in personalized patient care, particularly as this relates to HNC.

Abstract ID: 2343749

A multispecies subgingival biofilm model from periodontitis and peri-implantitis patients

Mercedes Fernandez y Mostajo

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Nominated IADR Scientific Category: Microbiology & Immunology

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Keywords: Biofilms, Periodontitis, Periimplantitis, Microcosm, *in vitro*.

Presenting in Session 7 - Oral Microbiology & Probiotics 2, Tue 3.45-4.00pm

Objectives: To compare the growth of multispecies biofilm derived from periodontitis and peri-implantitis donors on 2 types of surfaces (titanium, Ti and glass, G). Additionally we aimed to study the treatment of biofilms grown on Ti with chlorhexidine (CHX) and an oxygenating agent Ardox -X® (AX).

Methods: Subgingival plaque samples were collected from pockets (PPD \geq 6mm) of 3 patients diagnosed with periodontitis (P) and 3 patients diagnosed with peri-implantitis (PI). An active attachment biofilm model and specific medium (Thompson) supplemented with 30% serum was used. Ti and G discs were used as substratum (triplicate per group, total 4 groups). After 2 weeks of growth, biofilms were treated for 10 min with either water (W, control), CHX or AX and harvested. DNA of dead cells was blocked for amplification by propidium monoazide (PMA) treatment. Composition was analyzed using 16S RNA gene amplicon pyrosequencing. Similarities between the biofilms were assessed by non-metric Multidimensional scaling (n-MDS) using Bray Curtis (BC) similarity index. Inoculum source, surface type and treatment were compared.

Results: Biofilms consisted of genus *Peptostreptococcus* (P=16%,PI=2%), *Streptococcus* (P=21%,PI=56%), *Parvimonas* (P=27%,PI=17%), *Peptoniphilus* (P=10%,PI=1%), *Anaeroglobus* (P=1%,PI=3%); *Prevotella* (P=2%,PI=1%); *Filifactor* (P=3%,PI= 0%), *Veillonella* (P=1%,PI=5 %) among other 80 genera.

The n-MDS showed a clear clustering by inoculum source. P and PI derived biofilms were significantly different in composition ($p<0.001$) and were donor-associated ($p<0.0001$). No difference was found between biofilms grown on Ti or G ($p=0.319$). Similarity distances (BC) (range 0.6-0.8) and the Shannon diversity index (range 0.8-2.2) revealed no differences between the two substrata.

Exposure to CHX or AX did not result in significant changes in microbial composition compared to the control ($p=0.06$).

Conclusions: The growth of complex multispecies biofilms derived from periodontitis and peri-implantitis pockets was donor-associated and was not affected by the surface type. Single exposure to CHX or AX did not significantly affect the biofilm composition.

Abstract ID: 2338875

Identifying Threshold Learning Outcomes to shape undergraduate dental curricula

Andrew Flatau

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Nominated IADR Scientific Category: Education Research

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Keywords: Curriculum, Learning, Educational Assessment, Professional education.

Presenting in Session 14 - Education Research: Best Practices in Clinical Teaching, Wed 10.15-10.30am

The theory of threshold concepts (Meyer & Land, 2003) is a promising framework with which to innovate and integrate curricula. Using Threshold Learning Outcomes (TLOs), and reflective assessment tasks to help achieve those outcomes, can prepare students for an unknown future by ensuring that they graduate with the capabilities to tolerate ambiguity, make effective decisions, be reflective practitioners, and demonstrate professional attitudes and behaviours. The idea of TLOs provides the impetus to consider the learning continuum of the developing professional dentist. To date, there has been little charting of TLOs within dental curricula, and the identification of threshold concepts in the healthcare professions on the whole is relatively new (Barradell, 2013).

Threshold concepts are known to be transformative, reconstructive, integrative, irreversible, troublesome, bounded, discursive, and liminal (Kobus, 2011; Meyer & Land, 2005; Tsang, 2011) and also need to be successfully sequenced in order for the TLOs to achieve an integrative function within curricula.

In this paper, the authors describe the potential TLOs identified in an undergraduate dental course. For example, in Year 1 of the course we specify that the relationship between form and function in craniofacial and dental anatomy is a troublesome concept that is also bounded, integrative, and irreversible. Reaching this threshold of understanding enables students to more readily grasp and apply their understanding in later years to other TLOs, such as abnormal structure and function in the maxillofacial region, management of the oral environment, and developing reflective practice.

We will present a model utilising key reflective practice assessment tasks to achieve the TLOs in each stage of the course, and discuss the process by which we constructed the model. We welcome feedback on the model and seek to promote discussion about TLOs in the dental profession.

Abstract ID: 2343938

Dentition status & treatment needs of Down's syndrome individuals in Nuku'alofa

Mele Foliaki

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Nominated IADR Scientific Category: Oral Health Research

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Keywords: Downs Syndrome, dentition status, treatment needs, dental anomalies, Tonga.

Presenting in Session 13 - Behavioural, Epidemiologic & Health Services Research 4, Wed 12.30-12.45pm

Objectives: The objectives of this study are to determine the dental caries and treatment needs in children with Down's syndrome in Tongatapu and to investigate the prevalence and types of dental anomalies present in participants with Down's syndrome in Tongatapu.

Methods: The study was a cross-sectional study whereby participants dental caries and other dental anomalies was examined using the WHO basic oral survey form. Participants in this survey were adults and children with Down syndrome only in the island of Tongatapu in Tonga. All of those individuals with Down syndrome who attended 'Ofa Tui moe Amanaki (OTA) and Alonga Residential Centers (ARC) in Tongatapu were included in this survey.

Results: Thirty Down's syndrome individuals from two different institutions in Tongatapu were examined for dental caries (utilizing WHO criteria for diagnosis of dental caries) and types of dental anomalies present. Out of 30 patients examined, 14 of them were males and 16 were females. The mean DMFT score among the males was 8.42 and 8.88 for females. In the 2-10 age group, the mean dmft and DMFT scores was 5.89 in the 11-20 years age group, the mean dmft and DMFT was 6.13 and 12.21 scores in the age group of 22-48. The prevalence of class III skeletal relationship among the study groups was 83.3%. There was also a high prevalence of syndromic patients with different types of anomalies such as microdontia (53.3%), Hypodontia, Oligodontia (30%), over eruption (40%), tooth erosion (36.6%) and extrinsic staining (53.3%).

Conclusions: In conclusion, patients with Down's syndrome among these individuals presented with a high prevalence of dental caries and dental anomalies.

Abstract ID: 2338882

Oral cancer amongst Pacific Islanders in New Zealand from 2000-2010

Ratu Gavid

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

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Keywords: oral squamous cell carcinoma, incidence rate, histological differentiation, Pacific Island people.

**Presenting in Session 5 - Oral Medicine and Pathology 2,
Tue 11.30-11.45am**

Objectives: To describe the occurrence of oral squamous cell carcinoma (OSCC) amongst the different Pacific Island people in New Zealand.

Methods: With OSCC data obtained from the New Zealand cancer registry for the period 2000-2010, a descriptive review was carried out to determine the occurrence of OSCC amongst the Pacific Island cohort in terms of ethnic and gender distribution, age groups affected, site and histological differentiation. The age-standardized rate was calculated using the WHO World Standard population.

Results: The age-standardized incidence rate for OSCC amongst Pacific Island people in New Zealand for the time period 2000 to 2010 was 0.12 per 100,000 population. The occurrence of OSCC was highest amongst the Samoan (37%), followed by Tongan (20%) and Fijian (17%) population. Both genders had equal distribution of disease by age with the highest occurrence observed in the 60 to 64 years age group. The most commonly affected site was the tongue (59%) followed by the palate (15%); with half of the total OSCC cases histologically graded as moderately differentiated carcinomas.

Conclusions: The incidence rate of OSCC amongst Pacific Island people in New Zealand varied over the past decade.

Abstract ID: 2329167

Tooth loss and general quality of life: a population-based study

Dandara Haag

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

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Keywords: Quality of life, Tooth Loss, WHOQOL-BREF, Shortened Dental Arch, Functional Dentition.

Presenting in Session 3 - BE&HSR 3: Quality of Life and Workforce Research, Mon 3.45-4.00pm

Objectives: The aim of this study was to estimate the association between number of teeth and general quality of life. **Methods:** A population-based study was conducted with 1,720 individuals aged 20 to 59 years residing in the urban area of Florianópolis, Brazil in 2009. Data were collected at participants' households using a face-to-face structured questionnaire. In 2012 a second wave was carried out with 1222 individuals. General quality of life was assessed by using the World Health Organization Abbreviated Instrument for Quality of Life Assessment (WHOQOL-BREF). Oral examinations were performed allowing the estimation of number of teeth, prevalence of population with functional dentition (≥ 21 teeth) and shortened dental arch (SDA), which were considered as the main exposures. Sex, age, per capita household income, body mass index (BMI), hypertension, diabetes, xerostomia, decayed teeth, filled teeth, periodontal disease, dental pain, use of denture and smoking status were considered as potential confounders. Multivariable Linear regression models were performed to test the association between the main exposures and the domains of the WHOQOL-BREF adjusted for confounders.

Results: We analysed 1,186 (response rate: 69,0%) dentate individuals eligible for this study. Having more teeth was associated with higher scores on physical domain of the WHOQOL-BREF [$\beta = 0.06$ (95%CI 0.01; 0.12)]. Absence of functional dentition was associated with lower scores on the physical domain [$\beta = -0.99$ (95%CI -1.96; -0.03)]. SDA was not associated with any domain of the WHOQOL-BREF.

Conclusions: In the studied population, oral health as measured by tooth loss was associated with negative impacts on general quality of life assessed by the WHOQOL-BREF. There was no evidence that SDA is a condition that affects general quality of life.

Abstract ID: 2282582

Evaluating impacts of third molars experience on QoL using Twitter

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Nominated IADR Scientific Category: Oral & Maxillofacial Surgery

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Keywords: Twitter, HRQoL, OHRQoL, third molar, real-time.

Presenting in Session 2 - BE&HSR 2: Quality of Life Research, Mon 2.30-2.45pm

Objectives: This study aimed to: (1) explore and model real-time impacts of third molars (TMs) experience on quality of life (QoL); (2) assess some generic health-related quality of life (HRQoL) and oral health-related quality of life (OHRQoL) instruments' coverage to reported TMs QoL domains.

Methods: A pragmatic cross-sectional sampling of Tweets using Twitter Advanced Search for "wisdom tooth" retrieved 3537 tweets. A random selection of 999 tweets was considered for classification. Only 843 tweets were included for in-depth thematic analysis using Matrix Coding Query. Domains for generic HRQoL and OHRQoL instruments were plotted against the reported TMs QoL domains to calculate percentages of coverage.

Results: The identified QoL domains were: pain (n=348, 41%), mood (n=173, 20%), anxiety and fear (n=54, 7%), enjoying food (n=41, 4%), coping (n=37, 4%), daily activities (n=34, 4%), sleep (n=24, 2%), social life (n=19, 2%), physical health (n=17, 2%), ability to think (n=9, 1%), self-care (n=8, 1%) and sporting & recreation (n=2, <1%). A model for TMs impacts on QoL was constructed based on the reported interacting real-time TMs QoL domains. Among selected generic HRQoL instruments, the Assessment Quality of Life (AQoL-8D) was found to cover 87% of TMs QoL domains, while the remaining instruments assessed in this study cover from 33% to 60%. It was found that the selected generic OHRQoL instruments cover only 33– 60% of reported TMs QoL domains.

Conclusions: This study identified a new combination of QoL domains, using real-time Twitter data. The constructed TMs QoL model shows how TMs might impact on QoL. Although the reported set of QoL domains were generally under-represented among the assessed generic OHRQoL instruments, the AQoL-8D covered the majority of them. The identified QoL domains might be used to develop a new OHRQoL measure for TMs.

Abstract ID: 2327221

Root Caries Experience among Australians Adults

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Nominated IADR Scientific Category: Cariology Research - Clinical and Epidemiological Studies

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Keywords: root caries, Australian population, decayed filled root surfaces, decayed root surfaces.

Presenting in Session 3 - BE&HSR 3: Quality of Life and Workforce Research, Mon 4.15-4.30pm

Objectives: Increase in life expectancy and reduction in tooth loss in contemporary Australian adults may increase the population-level risk for having root caries. The aims of this study were: 1. to describe root caries experience in Australian adults. 2. to evaluate association of root caries with socio-demographic and socioeconomic indicators, clinical, and behavioural factors.

Methods: A secondary analysis was undertaken using data from National Survey of Adult Oral Health 2004-2006. The study group consisted of 5,505 persons aged 15-91 years randomly selected by a stratified, multi-stage probability sampling method. Study participants underwent an oral examination, performed by trained and standardized dentists, to determine root caries (defined as prevalence, decayed or filled root surfaces (root DFS) and decayed root surfaces (root DS)), oral hygiene and gingival condition. Questionnaires were administered to collect data on age, sex, education, region, income, toothbrushing, flossing, dental visiting pattern and smoking. Multivariable models were generated, accounted for the complex sampling design, to estimate prevalence ratios (PR) and rate ratio (RR) and their 95% confidence intervals (95%CI).

Results: The root caries prevalence was 25.3%(SE=0.09) with severity in root DFS and root DS was 0.87(SE=0.04) and 0.15(SE=0.01) respectively. Prevalence and severity of root caries significantly increased with older age. The high-income group had significantly lower root caries prevalence (PR[CI]=0.78[0.64-0.95]), mean root DFS (RR[CI]=0.68[0.52-

0.89]) and mean root DS (RR[CI]=0.23[0.13-0.42]) than the low-income group. Smokers had significantly higher root caries prevalence (PR[CI]=1.32[1.16-1.50]), mean root DFS (RR[CI]=1.57[1.32-1.85]) and mean root DS (RR[CI]=2.44[1.53-3.88]) than never-smokers.

Conclusions: Root caries has been found affecting a significant proportion of Australian adults. Those from lower socio-economic position and smokers presented a significantly higher prevalence and severity of root caries.

Abstract ID: 2343648

Genome sequence of *Streptococcus salivarius* NCTC 8618 (ATCC 7073T)

Nicholas Heng

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Nominated IADR Scientific Category: Microbiology & Immunology

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Keywords: Probiotics, *Streptococcus salivarius*, bacteriocin production.

Presenting in Session 7 - Oral Microbiology & Probiotics 2, Tue 4.45-5.00pm

Objectives: *Streptococcus salivarius* is a pioneer bacterial colonizer of the human oral cavity and is commonly associated with good oral health. Moreover, *S. salivarius* are prolific producers of proteinaceous antimicrobials (bacteriocins). *S. salivarius* NCTC 8618 (ATCC 7073T) is the type strain of the species and a potential probiotic candidate due to its broad-spectrum inhibitory activity against Gram-positive pathogens and selected Gram-negative bacteria. Despite the availability of several *S. salivarius* genome sequences, the genome of strain NCTC 8618 has not been sequenced. The objectives of this study are to sequence the genome of the *Streptococcus salivarius* strain 8618 and to elucidate its bacteriocin repertoire.

Methods: The genome of *S. salivarius* NCTC 8618 was shotgun-sequenced using the Roche GS Junior

pyrosequencer and the Life Technologies Ion Torrent-based Personal Genome Machine, yielding 30- to >200-fold coverage of each genome. The genome sequence data was assembled using either Newbler version 2.3 or the hybrid assembly option of MIRA v3.9. Contiguous sequences (contigs) were annotated using RAST v4.0.

Results: The complete genome sequence of *S. salivarius* NCTC 8618 totals 2,188,923 basepairs and contains six ribosomal RNA operons. A 40-kbp integrated (and possibly defective) bacteriophage was found, which is an unusual finding for *S. salivarius*. Two genetic loci, one encoding the lantibiotic peptide salivaricin D, and another potentially specifying the production of a non-lantibiotic bacteriocin, were also detected. The combined action of these two bacteriocins may account for the observed inhibitory activity against Gram-positive bacteria and it remains to be determined whether they also contribute to the killing of Gram-negative species.

Conclusions: The complete genome sequence of the *Streptococcus salivarius* type strain NCTC 8618 is now available, and its bacteriocin repertoire appears to comprise the lantibiotic salivaricin D and a putative non-lantibiotic peptide system. This work was funded by a grant from the New Zealand Dental Association Research Foundation.

Abstract ID: 2330193

Rabbit TMJ osteochondral defect regeneration using TMJ synovial fluid MSCs

Saeed Idrees

Kyoto University

Nominated IADR Scientific Category: Stem Cell Biology

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Keywords: temporomandibular joint, Osteoarthritis, mesenchymal stem cells, synovial fluid, chondrocytes.

Presenting in Session 15 - Biomechanics and Tissue Engineering, Wed 12.00-12.15pm

Objectives: Background: The most common joint pathology affecting the temporomandibular joint (TMJ) is the degenerative joint disease, also known as osteoarthritis or osteoarthritis. Among individuals with TMJ disorders, 11%

have symptoms of TMJ-osteoarthritis (TMJ-OA). Once the breakdown in the joint starts, TMJ-OA can be crippling, leading to a variety of morphological and functional deformities.

Objective: Adequate amount of mesenchymal stem cells (MSCs) can be obtained from synovial fluid (SF) of TMJs with relative ease without injuring healthy tissue. TMJ arthrocentesis is a routine procedure in oral and maxillofacial departments for TMJ disorders (TMD) patients. The aim of this study is to regenerate cartilage with osteochondral defects on the articular surface of the TMJ using of SF.

Methods: In this study MSCs concentration in the TMJ-SF was increased by inducing osteoarthritis by mechanical overloading for 4 weeks in Japanese white rabbits TMJs. A rabbit model is ideal as its size is suitable for good anatomical observation and manipulation.

Cells were aspirated from the TMJ (in a procedure stimulating TMJ arthrocentesis performed on TMD patients) then cultured in cell culture dishes. Subsequently, 200,000 cells were placed in 15-ml polypropylene tube and centrifuged at 450 g for 10 minutes then TMJ-SF-MSCs pellets were cultured in a chondrogenesis media to differentiate into chondrocytes for 21 days. Differentiated chondrocytes were transplanted to the defects made on the TMJ articular surface of six rabbits.

Results: Histological examinations showed significant regeneration of the cartilage compared to the control group. Furthermore, our data indicate that TMJ-SF-MSCs may be similar to bone marrow derived MSCs and express similar cell surface markers.

Conclusions: TMJ-SF-MSCs may be a promising candidate cell type for cell-based strategies for articular cartilage repair in the future.

Abstract ID: 2331155

Efficacy of a Mandibular Advancement Appliance on Paediatric Sleep Disordered Breathing: a preliminary report.

Ghassan Idris

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Nominated IADR Scientific Category: Evidence-based Dentistry Network

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Keywords: Children, Sleep Disordered Breathing, Obstructive Sleep Apnoea, Snoring, Mandibular Advancement Splints.

Presenting in Session 10 - Craniofacial Biology 1, Tue 2.45-3.00pm

Objectives: Sleep Disordered Breathing (SDB) varies from habitual snoring to obstructive sleep apnea and can be found in up to 10% of children. Mandibular Advancement Splints (MAS) may represent a non-invasive alternative treatment to adenotonsillectomy. The efficacy of MAS is well established in adults but unclear in children. The aim of this study is to report the preliminary findings of a randomized clinical trial testing the efficacy of MAS appliance in SDB children.

Methods: The study was designed as a single-blind crossover randomized controlled trial with administration of active MAS "Twin-Block" and a placebo MAS "Sham MAS". Five participants (9.9 ± 0.7 years) with ≥ 4 snoring nights per week were enrolled in the study and randomly assigned to either a sequence starting with Twin-Block or Sham MAS. The participants wore the appliances for three weeks separated by a two-week washout period. Home-based polysomnographic data "sleep studies" were collected four times for each participant at baseline and after treatment with Twin Block or Sham MAS. Supine Apnoea Hypopnea Index (AHI) was assessed as the main outcome variable. In addition, parent's reports of snoring frequency were collected as secondary outcome.

Results: Polysomnography showed average baseline supine AHI of 9.4 ± 10.8. Participants showed improvement with Twin-block as supine AHI decreased of 4.9 ± 6.6 event/hour. Conversely, supine AHI showed increase of 1.6 ± 4.7event/hour with Sham MAS. Parents reported less snoring nights when participants wore the Twin-block MAS (2.6 ± 4.2 snoring-nights) in comparison with the Sham MAS (6.7 ± 2.1 snoring-nights).

Conclusions: The use of mandibular advancement splints resulted in a reduction of supine AHI and of the frequency of snoring nights in patients with paediatric SDB. However a

larger sample is required to confirm these preliminary findings.

Abstract ID: 2344057

Histomorphometric Outcomes of Periodontal Regeneration with Multiphasic Scaffold in Sheep

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Keywords: Periodontal regeneration, Tissue engineering, Periodontal ligament cells.

Presenting in Session 5 - Oral Medicine and Pathology 2, Tue 12.15-12.30pm

Objectives: Multiphasic scaffolds are ideally suited for periodontal regeneration, as they can facilitate this complex wound healing process requiring the co-ordinated response from multiple tissues. The aim of this study was to evaluate a tissue engineering approach incorporating a biphasic scaffold for cell sheet delivery and enhanced biomechanical stability.

Methods: The biphasic scaffold was fabricated from polycaprolactone by melt and solution electrospinning, permitting the fabrication of a highly porous and fibrous structure with desirable properties for both bone and periodontal ligament regeneration. Autologous periodontal ligament cells (PDLC), gingival fibroblasts (GF) and bone marrow mesenchymal stem cells (MSC) were cultured to form a cell sheet and harvested using the biphasic scaffold. The scaffolds were then implanted bilaterally in fenestration defects of 14 sheep for 5 or 10 weeks. Histomorphometric analysis was carried out to assess the percentage of the exposed root surface that had cementum root coverage, periodontal fiber attachment and 'complete' periodontal

regeneration (bone/perpendicularly inserted PDL/cementum). Results: No differences were between the groups were found at 5 weeks. By 10 weeks, the control, PDLC and MSC groups had improved 'complete' periodontal regeneration compared to 5 weeks ($p < 0.05$). Furthermore, at 10 weeks, GF had less periodontal regeneration than MSC and PDLC ($p < 0.05$).

Conclusions: Our findings show that the biphasic scaffold was capable of space maintenance and wound stabilization, which are essential for periodontal regeneration to occur. It also revealed that the regenerative outcome is cell-source dependent as healing was impeded by implanted GF, whereas PDLC and MSC both supported periodontal regeneration.

Abstract ID: 2335232

Prioritising public dental care improves self-rated health outcomes

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

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Keywords: Aged, Dental Care for Aged, Health Status, Primary Health Care, Oral Health.

Presenting in Session 1 - BE&HSR 1: Epidemiology, Economics and Inequalities, Mon 11.30-11.45am

Objectives: Most older Australians have concession status and can access public dental care services, yet long waiting times impede timely preventive and restorative care. We report data from an intervention in South Australia which compared self-rated general and oral health outcomes among older persons assigned to either prioritised care (no waitlisting) or waitlisted care (4 – 6 months wait) at a South Australian Dental Service clinic.

Methods: Recruitment of participants at baseline was conducted via health assessments at 26 general practice clinics across metropolitan Adelaide. Participants ($n = 110$) recruited in 5 months from November 2013 to May 2014 were randomised to be either prioritised or waitlisted, and

simultaneously sent a baseline questionnaire which included oral and general health measures. Respondents (n = 85, 77%) were sent a follow-up questionnaire 1 year on (n = 62 or 85% response rate at follow-up). The follow-up instrument added two transition statements - items that elicited change in self-perceived oral and general health.

Results: Comparison of sociodemographic, health and behavioural factors between groups suggested broad baseline equivalence. Overall, prioritised participants reported larger improvements in health from baseline to follow-up than those waitlisted. Poor self-rated oral health decreased significantly from 58.6% at baseline for both groups to 34.5% for prioritised and 44.8% for waitlisted (P < 0.05). Self-rated general health had also improved for both groups, but the difference between groups was not significant (P > 0.05). In health transition statements at follow-up, the percent of participants reporting their general health had improved was significantly higher for prioritised than waitlisted (23.3% vs 3.7%, P < 0.05), and there was a smaller and non-significant difference for oral health (20.0% vs 7.4%, P > 0.05). Conclusions: Findings from this intervention indicate the potential for improved oral and general health outcomes from prioritisation of public dental care for eligible older persons.

Abstract ID: 2329547

Risk indicators of Chronic Periodontitis in Community Dwelling Elderly Malaysians

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Nominated IADR Scientific Category: Periodontal Research - Diagnosis/Epidemiology

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Keywords: Chronic periodontitis, Elderly, Aging, Risk factors.

Presenting in Session 3 - BE&HSR 3: Quality of Life and Workforce Research, Mon 4.00-4.15pm

Objectives: Chronic periodontitis is a global health issue. Chronic Periodontitis has multiple risk factors and modifying factors which includes smoking, diabetes, obesity and old

age. The aim of this study is to identify the risk indicators for periodontitis in community dwelling elders in Malaysian population.

Methods: This is a cross sectional study on Elderly population recruited from high impact research group known as Malaysian Elders Longitudinal Research (MELoR). Ethical approval was obtained. Participants included 237 dentate participants, aged 55 and above. Comprehensive medical examination was done. The social demographics, habits and oral hygiene behavior were assessed. Periodontal examination was carried out using basic periodontal examination (BPE) as a screening tool. The participants were categorized based on BPE scores as (1) No periodontitis (BPE score 0, 1 and 2) and (2) Chronic periodontitis (BPE score 3 or 4). Data was analyzed using SPSS version 22.0. The association of chronic periodontitis with various risk factors was carried out using multivariate binary logistic regression analysis.

Results: The overall prevalence of chronic periodontitis in elderly population was 19.4%. The mean age of participants with chronic periodontitis was 67.8 (SD 7.4). The prevalence of chronic periodontitis was found to be higher among male gender, Indian ethnicity, lower education level and high waist circumferences (obesity). The multivariate binary logistic regression showed significantly higher odds ratios (OR) of having chronic periodontitis among current smokers OR 1.6 (CI 95%-0.6-4.7), high waist hip ratio (WHR) 1.4 (0.6-2.4). Male gender 1.2 (0.6-2.3), Indian ethnicity 1.2 (0.5- 2.4), lower education level 1.3 (0.6-2.9) showed a weak association with chronic periodontitis.

Conclusions: Smoking habit and high WHR was found to have significantly higher associated risk for chronic periodontitis in the studied population. Longitudinal cohort studies could help us better understand the true relationship of chronic periodontitis with its risk factors.

Abstract ID: 2328930

Is the "Bula Smile" important in marketing Eco-tourism in Fiji?

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Keywords: oral health , Eco-tourism .

Presenting in Session 13 - Behavioural, Epidemiologic & Health Services Research 4, Wed 12.15-12.30pm

Objectives: 1. To determine the oral health status of Nataleira villagers and relate the importance of good oral health in promoting eco-tourism.

2. To foster team work amongst dental students and staff in appreciating challenges in promoting oral health when working in communities.

Methods: Permission for study was approved by village elders. Overall average team kappa value was 0.96. Examinations done using a dental mirror and WHO periodontal probe. Data entered in modified WHO oral health survey form (n= 133 adults and 138 children) and analyzed for mean and frequency, using SPSS version 20.

Results: Dental caries in adults and children were high with a mean DMFT of 10 and mean dmft of 8, respectively. Community Periodontal Index of 0, 1, 2 and 3 was used to measure periodontal health with 0.9, 2.6, 4.3 and 0.8 sextants affected/person. Medical conditions such as Diabetes and Hypertension were low. The study reported that in 87% and 77.5% of decayed teeth only 16% and 10% were restored in permanent and primary teeth consecutively. Conservative treatment of carious teeth to prevent edentulousness was urgently needed apart from the 218 teeth indicated for dental extractions.

Conclusions: Prevalence of dental caries and periodontal disease was very high in the village of Natalleria, an oral health factor crucial in marketing the 'Bula Smile'.

Abstract ID: 2324877

The inverse care law: permanent conundrum for dental public health?

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Keywords: dental services, inequality, access.

Presenting in Session 1 - BE&HSR 1: Epidemiology, Economics and Inequalities, Mon 11.00-11.30am

Objectives: In 1971 Tudor Hart first described the inverse care law, which states that the availability of good medical/dental care tends to vary inversely with the need for it in the population served. Does this still apply to modern day services? If so, why is this, given our current awareness and knowledge? The situation in Australia in this regard will be examined and discussed, with reference to specific subgroups in the population that experience poorer oral health. Whether there really exists a need for dental services in all areas where they are not available, will also be examined.

Methods: Using various open access and existing population-level databases, and geographic information system (GIS) technology, the mal-distribution of the workforce and available services will be illustrated.

Results: Results indicate that services are most accessible and available where they are needed less. Some parts of the population have no access at all, or very limited access, to dental services.

Conclusions: These results leads to certain questions: does service provision not just create demand? Will more services ultimately improve population oral health? How realistic is equal dental workforce distribution in Australia? Reasons will be discussed as to why the dental workforce in Australia will never be equally distributed. Some other possible methods that might contribute towards achieving equity in access to good oral health care will be put forward.

Abstract ID: 2339204

Measuring quality of life outcomes in children with dental caries for use in economic evaluations

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

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Keywords: utility , QALY , MAUI , quality of life, generic .

Presenting in Session 3 - BE&HSR 3: Quality of Life and Workforce Research, Mon 4.45-5.00pm

Objectives: Health utility is similar to health-related quality of life and required in economic evaluations. However, commonly used multi-attribute utility instruments (MAUIs) in dental economic evaluations are rare. Unavailability of suitable instruments is one factor for this. The aim of this study was to use a generic paediatric MAUI to estimate health utility of children with dental caries, the first time this has been undertaken.

Methods: The study was conducted in a primary health care setting in Queensland. Health states from the Child Health Utility (CHU-9D) instrument, a generic MAUI, were used to estimate the utility of the children suffering dental caries. The children were aged from six months to 6 years (n=106). The CHU-9D was answered by the parents of the children. At the same time, dental examinations were conducted to determine the caries experience of decayed missed filled teeth (dmft) of the children. The utility scores were estimated for CHU-9D health states using the UK utility value set.

Results: Of the 106 participants who took part in the study, 5.6% did not complete the questionnaire. 'Severe problems' across the dimensions were reported by 1% to 5% of the sample. Ninety percent of the parents agreed that the CHU-9D dimensions covered dental health related quality of life of their children. On a scale of 0 to 1, with 1 indicating best health, the mean utility score of the sample was 0.91 (SD=0.12). The mean dmft of the sample was 5.9 (SD=3.6). The correlation between the dmft and utility was 0.029.

Conclusions: Use of generic MAUIs in dental care is feasible. However, to capture dental-specific quality of life, a dental-specific MAUI could be explored. Development of such instrument could facilitate precise economic evaluation in dental-care.

Abstract ID: 2344092

Visitor Perceptions of the “Bula Smile” in the Suva Area, Fiji - A Pilot Study

Reginald Kumar

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

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Keywords: Smile, Perceptions.

Presenting in Session 13 - Behavioural, Epidemiologic & Health Services Research 4, Wed 12.00-12.15pm

Objectives: The aim of this study is to document visitor perceptions of the Bula Smile and to determine the impact of such on their decision to choose Fiji as a future tourism destination.

Methods: A cross-sectional study was conducted with 32 participants who were international visitors accommodated at the Capricorn Hotel in Suva. Data was collected with a questionnaire, which documented the awareness of the Bula Smile and the effects of the different types of Bula Smile on visitor perceptions.

Results: The most common positive observation of the people of Fiji was their friendliness (47%) followed by the Bula Smile (34%). Majority of the visitors agreed that the Bula Smile of the employees was appealing as well giving a positive impression of Fiji. Teeth (62%) was the most prominent feature of the Bula Smile followed by a big smile (13%), with lips (11%), gums (11%) and 3% opting for none of the options. Approximately 34% of the visitors indicated that the Bula Smile had affected their stay and impression of Fiji. Smiles with decayed, missing or poorly filled front teeth changed the impression of 38% of the visitors, which also gave a negative impression of the health status of Fijians.

Conclusions: The results suggest that the Bula Smile is being noticed while also creating a positive impression of the people, the country, the service and the overall Fiji Experience. Moreover, the onus is on those in the tourism industry to exploit the many positives of the Bula Smile, using it to recruit new visitors while also influencing a return visit to Fiji.

Abstract ID: 2338253

Effect of cigarette smoke on oral cells

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Nominated IADR Scientific Category: Global Oral Health Inequalities Research Network

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Keywords: cigarette smoke condensate, CYP1B1 gene, gingival fibroblasts, oral epithelial cells.

Presenting in Session 5 - Oral Medicine and Pathology 2, Tue 11.00am-11.15am

Objectives: To investigate the effect of commercially available cigarette smoke condensate (CSC) on the expression of the CYP1B1 gene in oral cells. CYP1B1 belongs to the cytochrome P450 superfamily and is a key player in drug metabolism. It is up-regulated in tobacco smokers and has been chosen to validate the *in vitro* cigarette smoke treatment.

Methods: Human gingival fibroblast (HGF) and oral epithelial (OEC) cell lines (both n=3) were exposed to various concentrations (0-600 μ g/mL) of CSC (Murthy Pharmaceuticals) for 24, 48 and 72 hours. Cell proliferation was evaluated using Celltitre Blue Assay. Total RNA was purified from HGF and OEC following exposure for 72 hours to 100 μ g/mL and 50 μ g/mL CSC respectively. A duplex qPCR Taqman Gene Expression Assay was used to compare the mRNA level of the CYP1B1 gene between the treated and untreated cells.

Results: CSC induced increased proliferation at 100 μ g/mL in HGFs compared to its vehicle control. In contrast, the effect on OEC was a dose-dependent decrease in cellular proliferation. It was toxic at concentrations ≥ 200 μ g/mL and 100 μ g/mL for HGF and OEC respectively. The mRNA level of the CYP1B1 gene was up-regulated by 2.2 fold in HGF, and also found to be up-regulated in preliminary results in OEC.

Conclusions: CSC affects the proliferation of both HGF and OEC, and up-regulates the expression of CYP1B1 gene in both the cell lines. Therefore, this *in vitro* cigarette smoke treatment is valid and may be used in laboratories to simulate smoking.

Abstract ID: 2327212

Provision of oral healthcare to cancer patients in Australia

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Nominated IADR Scientific Category: Oral Medicine & Pathology

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Keywords: oral healthcare, oncology, oral mucositis.

Presenting in Session 5 - Oral Medicine and Pathology 2, Tue 11.45am-12.00pm

Objectives: Access to oral healthcare is an important component in the multi-disciplinary care of cancer patients. This study aimed to identify dentists' involvement in cancer care and investigate their knowledge in this aspect of dental practice.

Methods: A web-based survey was emailed to 10,954 dentists via local branches of Australian Dental Association. The survey requested details of dentists' experience in the oral health care of cancer patients as well as demographic and practice characteristics.

Results: Five hundred and thirteen (513) dentists responded to the survey (Response Rate: 4.7%). Around 85% of respondents were general dentists, 87.3% worked in private practice and 74.9% in metropolitan locations. Dentists who were actively involved in the oral healthcare of cancer patients represented 22.8% (n=117). These dentists received referrals from medical practitioners, cancer treatment facilities or from other dental colleagues (52.1%, 31.6% and 34.1% respectively).

Approximately 28% of dentist reported having no defined oral healthcare protocols for cancer patients, 25.9% treated patients only for obvious dental problems and 56.0% assessed all patients requiring chemotherapy or head and

neck radiotherapy. A wide range of oral health services was reported ranging from pre-cancer treatment oral health assessments (88.8%) to long-term follow up (78.4%).

Few dentists specifically managed oral mucositis (49/117, 41.9%) and of these 64.7% didn't follow a clinical guideline. The use of specific therapeutic agents for prevention or treatment of oral mucositis identified low adherence to internationally accepted clinical guidelines. 79.9% felt they required additional training in oral healthcare of cancer patients.

Conclusions: Education in the management of mucositis for oral health professionals and increased access to appropriate oral healthcare for cancer patients is required.

Abstract ID: 2343928

Accuracy of dental implant positioning as achieved in practice

Orit Oettinger-Barak

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Nominated IADR Scientific Category: Implantology Research

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Keywords: implant positionings, positional guide, implant parallelism.

Presenting in Session 15 - Biomechanics and Tissue Engineering, Wed 11.30-11.45am

Objectives: To evaluate dental positioning as achieved in practice and to investigate influencing factors.

Methods: Data of patients' files treated with were obtained and digitised. Angular relationships between implants and adjacent structures and horizontal distance between implants and adjacent structures were measured. Statistical analysis was conducted for results.

Results: 278 implants inserted for 121 patients were measured. Implants were found to be more parallel to the mesial tooth ($181.31\pm 0.58^\circ$) than mesial implant ($175.43\pm 0.99^\circ$, $P=0.001$), and as expected, a smaller horizontal distance was seen between implant-tooth ($2.07\text{mm}\pm 0.13\text{mm}$) than implant-implant ($3.29\text{mm}\pm 0.33\text{mm}$, $P=0.001$). Posteriorly placed implants were

found to be less parallel ($165.23\pm 1.79^\circ$) than anterior ($179.44\pm 0.75^\circ$, $P=0.010$) and premolar implants ($174.34\pm 1.11^\circ$, $P=0.001$). No significant difference was seen in the angulation between implants and adjacent structures with or without the use of a positional guide; however, using positional guides resulted in greater horizontal distances between implant-implant ($4.53\pm 0.59\text{mm}$) compared to those placed without the guide ($2.85\pm 0.49\text{mm}$, $P=0.037$).

Conclusions: Implants were mostly positioned accurately in practice. Implants were found to be more parallel to adjacent teeth than implants, hence adjacent teeth rather than implants should be considered for accurate implant placement. Special attention should be given while placing implants at the posterior regions, as they tend to be less parallel. As surgeons tend to place implants in the ideal distance from adjacent implants, a positional stent is warranted whenever a different position is required for rehabilitation.

Abstract ID: 2288610

Oral Features of Crouzon and Pfeiffer Syndromes **Manjara Packianathan**

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Nominated IADR Scientific Category: Craniofacial Biology

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Keywords: Crouzon syndrome, Pfeiffer syndrome, Craniosynostosis, Micro-computed-tomography, Dental anomaly.

Presenting in Session 11 - Craniofacial Biology 2, Tue 4.15-4.30pm

Objectives: Crouzon and Pfeiffer are craniosynostosis syndromes with variable craniofacial phenotype in which dental anomalies have occasionally been reported. A clinical and histological study of a patient cohort with Crouzon and Pfeiffer syndromes was undertaken to evaluate the range and incidence of oral and dental anomalies and diseases to provide recommendations for improving dental care. The

null hypothesis was that there are no differences in oral tissues and diseases between Crouzon or Pfeiffer syndrome patients and the normal population.

Methods: Patients with Crouzon and Pfeiffer syndromes attending the Australian Craniofacial Unit, Adelaide Women's and Children's Hospital from February 2011 to June 2014 were evaluated for details of medical history, oral diseases, oral disease risk and dental anomalies at time of routine dental examination. Samples of dentition, alveolar bone and oral mucosa which had been removed during treatment were analysed using stereomicroscopy, micro-computed- tomography (microCT), light microscopy and scanning electron microscopy, and compared with controls.

Results: The dataset comprised 22 patients (10 male, 12 female) aged between 3 months and 36 years. Genetic testing confirmed 16 Crouzon syndrome and 6 Pfeiffer syndrome patients. An increased risk of caries was identified due to medical, tooth, oral hygiene and dietary factors. All patients demonstrated a dental and skeletal malocclusion. Patients above 18 years showed signs of periodontitis. Dental anomalies existed in most patients, and were distinct from normal controls. Tooth histology and microCT analysis revealed hypomineralisation and/or hypoplasia in all cases (Crouzon n=12, Pfeiffer n=10). Tooth histology revealed a loss of scalloping of the dento-enamel junction of some teeth.

Conclusions: Dental anomalies, oral disease risk factors and scope for improved oral healthcare in patients with Crouzon and Pfeiffer syndromes were identified. Comprehensive dental care with emphasis on prevention should occur as part of ongoing multidisciplinary treatment, to which the paediatric dentist is integral.

Abstract ID: 2320069

Dental health and body mass index among Special Olympics Athletes

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Nominated IADR Scientific Category: Global Oral Health Inequalities Research Network

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Keywords: Dental health, body mass index, intellectual disability, common risk factor , interdisciplinary.

Presenting in Session 2 - BE&HSR 2: Quality of Life Research, Mon 2.45-3.00pm

Objectives: Special Olympics (SO) provides a unique opportunity for SO athletes to undergo interdisciplinary health screenings - Special Smiles (SS), health promotion (HP), Opening eyes, Healthy hearing and Fit feet, and contributes to the world's largest health database on people with intellectual disabilities (ID). Data extracted from SS and HP have been linked to determine the association between dental status and body mass index (BMI), for a stronger health message to SO athletes and their accompanying coaches/carers for better oral and general health behaviours and outcomes.

Methods: At the National SO Games (2014), three volunteer dentists screened consenting SO athletes (n= 116; 15 – 57 years old). Dental status (recorded using WHO criteria) measured the number of decayed (D), missing (M), filled (F) teeth and caries experience (DMFT>0). BMI was measured by volunteer sports dietitians and categorized as underweight (<18.5), normal (18.5-24.9), overweight (25.0–29.9) and obese (≥30).

Results: The prevalence of decayed teeth was 16% and the mean DMFT was 4.0. About 40% of SO athletes had one or more missing and filled teeth. Less than a third of the SO athletes had normal weight (31%), and the rest were overweight (40%) or obese (27%). One was underweight. Missing teeth and caries experience were significantly associated with higher BMI (χ^2 , p<0.05).

Conclusions: The prevalence of untreated decay among SO athletes was lower than the general population. However, this population who represent younger, healthier, higher functioning people with ID, had significantly higher BMI than the general population. A more efficient common risk factor approach that targets both dental caries and obesity simultaneously should be adopted to improve the oral health and general health of SO athletes and the larger, more vulnerable population of people with ID.

Abstract ID: 2333010

Extraction socket healing in humans after ridge preservation techniques: short-term analysis of remodeling pattern comparing use of two types of xenografts.

Alessandro Quaranta

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Nominated IADR Scientific Category: Implantology Research

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Keywords: alveolar bone loss, bone remodeling, xenograft, extraction.

Presenting in Session 15 - Biomechanics and Tissue Engineering, Wed 11.45am-12.00pm

Objectives: The aim of this controlled clinical study was to analyze and compare the alveolar ridge remodeling after ridge preservation procedures using two different biomaterials compared to a negative control (spontaneous healing)

Methods: Ninety patients subjected to single-tooth extraction were enrolled in the present multicenter, single-blind, prospective, controlled, randomized clinical trial. Thirty sites were randomly allocated to each of the two test groups; 30 patients, underwent to extraction alone and to spontaneous healing, represented the negative control. The test sites were grafted with pre-hydrated collagenated cortico-cancellous porcine bone (hG) or with a cortical porcine bone (cG) and a collagen membrane. Anatomic measurements and related outcome variables at the third-month were statistically compared.

Results: 3-month analyses revealed that cG-group showed statistically significant results in maintaining changes at vertical bone level (Δ VBL) when compared to the group of non-grafted sockets (nG), exhibiting a 0.35 ± 1.21 mm vertical bone loss ($P=0.0097$). Both pre-hydrated cortico-cancellous porcine bone (hG) group and cG-group displayed a greater capacity of preserving alveolar width (Δ BLW), respectively with a loss of 0.93 ± 1.25 mm and 1.33 ± 0.71 mm ($P<0.0001$), with regard to nG-group (Δ BLW of -3.60 ± 0.72 mm). hG-group showed a loss in width of

keratinized gingiva (Δ WKG) of 0.26 ± 1.29 mm, cG-group showed a rise of 0.10 ± 1.61 mm, whereas nG-group showed a gain of 0.70 ± 0.59 mm.

Conclusions: Within the limits of the present study, cortical porcine bone better preserved the ridge height, whilst pre-hydrated collagenated cortico-cancellous porcine bone achieves higher results in maintaining ridge width. Spontaneous healing seems to be the best choice to maintain the width of keratinized gingiva.

Abstract ID: 2300905

Tooth Mousse® for dental caries - clinical evidence. A systematic review.

Sarah Raphael

University of Sydney, Colgate Oral Care

Nominated IADR Scientific Category: Oral Health Research

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Keywords: Dental Caries, Preventive dentistry, Tooth Mousse®, CPP-ACP Paste, Clinical trials.

Presenting in Session 7 - Oral Microbiology & Probiotics 2, Tue 4.15-4.30pm

Objectives: Dental Professionals need to consider the evidence for the effectiveness of the strategies used to prevent and manage dental caries in their patients. Whilst traditional preventive strategies including the use of fluorides and fissure sealants have been extensively researched, some of the newer technologies have a more limited evidence base to support their recommendation and use in clinical practice. In order to investigate the level of scientific support behind one such technology, Tooth Mousse®, a systematic review of the literature was undertaken. The aim of this review was to answer the question. "Is there sufficient clinical evidence available to support the use of Tooth Mousse® and Tooth Mousse Plus® over a routine fluoride home oral care regimen for the prevention and treatment of dental caries?"

Methods: The terms "Casein Phosphopeptide Amorphous Calcium Phosphate", "CPP ACP", "Tooth Mousse" "Tooth

Mousse Plus”, “MI Paste” and “MI Paste Plus” were searched using Medline via OvidSP and EMBASE to capture all published studies. In addition, the terms “Casein Phosphopeptide Amorphous Calcium Phosphate” and “CPP ACP” were searched using PREMEDLINE and the Cochrane Central Register of Controlled Trials. Only research studies in English were selected.

Results: 7576 articles containing many duplicates were initially identified. 172 articles were inspected and limited to the research focus of ‘CPP-ACP formulations of Tooth Mousse® (MI Paste®) and Tooth Mousse Plus® (MI Paste Plus®). 12 of the 29 resulting studies met the inclusion criteria and were considered acceptable to answer the research question. The overall findings of the systematic review were equivocal and showed no clear benefit for the use of Tooth Mousse® products over brushing with fluoride toothpaste.

Conclusions: This systematic review suggests that further large-scale population-based studies are required before Tooth Mousse® products can be routinely recommended for the prevention and treatment of dental caries.

Abstract ID: 2317077

Self-assessment for a life-long learner

Atieh Sadr

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Nominated IADR Scientific Category: Education Research

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Keywords: Self-assessment, reflective learning, life-long learning.

Presenting in Session 14 - Education Research: Best Practices in Clinical Teaching, Wed 10.00-10.15am

Objective: It is expected that following graduation students can regulate their own practice specially for dentists that may their work are hidden by their very location, it needs changing pedagogy to more interactive approach. This presentation reports three years of implementation of self-assessment for the practical tasks in an Endodontic program in a dentistry course for undergraduate third year dental students based upon independent, reflective learning.

Methods: The final year practical results were analyzed of three successive cohorts of third-year students to an Endodontic program. Firstly students were asked about criteria for each stage of Endodontic practical task through a formative exam, after modification and revision of ideas students were asked to submit their self-assessment for each of their practical task in the simulation clinic through pebble pad software. Student’s marks were compared with teacher’s mark by chi-square. A questionnaire also was distributed to the students immediately before their final examination to value of self- assessment. The Questionnaire asked about confidence in assessing the performance.

Results: There was a close connection between student’s and the teacher’s marks. The new approach of self-assessment increased student confidence in practical skills, there was a perceived increase in problem-solving ability; and that students felt encouraged to pursue greater understanding.

Conclusions: Self-assessment will help to make life-long learner. Some experimental learning points were derived from the study like finding low or over confident students. These included the importance of careful planning, well-designed assessment procedures and the creation of a climate of trust and openness. Pebble pad software was a better way to get ideas from digital generation students; it was more attractive for students compare to paper based one.

Abstract ID: 2323038

Osteogenic Differentiation of Rabbit Adipose-Derived Stem Cells: A histomorphometry study

Zahra Sarabadani

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Nominated IADR Scientific Category: Stem Cell Biology

Authors/Institutions: Z. Sarabadani, H. Semyari, H. Riazi, M. Hemmati, Periodontics, Dental School of Shahed University, Tehran, Tehran, IRAN (THE ISLAMIC REPUBLIC OF)

Keywords: Adipose-derived stem cell, Osteogenic differentiation.

Presenting in Session 15 - Biomechanics and Tissue Engineering, Wed 12.15-12.30pm

Objectives: Adipose tissue is an easily obtainable and robust source of adipose-derived stem cells (ADSC) which their role in regenerative process has been demonstrated in several studies. In this study ADSCs of intra scapular subcutaneous adipose tissue of rabbit had derived, then the possibility of their differentiation to the osteoblasts was evaluated by histomorphometrical analyses

Methods: Adipose tissue of intra scapular region of 12 male New Zealand rabbits was harvested during the direct surgery or liposuction. After stem cell preparation, they were culturing in a mixture of a kind of phosphate-based differentiation cocktail and growth media. Presence of osteocyte was evaluated via alizarin red staining and histomorphometry analyse.

Results: The histological staining showed the differentiation of ADSCs to osteocytes and after 21 days alizarin red staining showed the mineralized matrix.

Conclusions: This study showed the differentiation of ADSCs to osteoblast in a phosphate-based matrix. However, more studies about the differentiation of ADSCs to variant cell lines and the essential matrix are necessary.

Abstract ID: 2326145

Longitudinal effects of socioeconomic status on periodontitis: a systematic review

Helena Schuch

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

Authors/Institutions: H.S. Schuch, K. Peres, A. Singh, M.A. Peres, L. Do, Australian Research Centre for Population Oral Health (ARCPOH) - School of Dentistry, The University of Adelaide, Adelaide, South Australia, AUSTRALIA

Keywords: Inequality, Socioeconomic Status, Periodontal Diseases, Systematic Review, Longitudinal Studies.

Presenting in Session 13 - Behavioural, Epidemiologic & Health Services Research 4, Wed 11.45am-12.00pm

Objectives: To systematically review all longitudinal studies investigating the effect of socioeconomic status (SES) during the life course on the development of periodontal diseases (PD) in adulthood.

Methods: Inclusion criteria were epidemiological longitudinal observational studies, in which indicators of relative individual level SES were assessed prior to clinical assessment of PD as the primary outcome; publications in English. A search was performed in six electronic databases (PubMed, EMBASE, Web of Science, Scopus, LILACS and ScieLO). The methodological quality of the studies was assessed using Newcastle–Ottawa Quality Assessment Scale (NOS) for cohort studies.

Results: The search identified 1,507 papers. After removal of duplicates (n=685), title and abstract screening (n=795) and full text review (n=19), eight original manuscripts from seven epidemiological studies were finally included in this review. Sample sizes ranged from 167 to 2806, and the time frame (from exposure to follow-up) varied from 2 to 23 years, with the majority of the studies within 5–11 years range. SES indicators included education, occupation and family income. PD outcomes assessed by the studies were periodontal attachment loss, probing pocket depth and alveolar bone loss. In general, the included studies presented low risk of bias, with 87.5% of papers considered as high quality based on NOS. There was significant heterogeneity between the studies. Six out of eight selected papers reported that socioeconomic deprivation in early life exerted significant negative impact on periodontal health measured in adulthood.

Conclusions: The available scientific evidence demonstrates potential long-term impact of socioeconomic position early in life on periodontal health. Prospective analytical cohort studies with long time follow-up are needed to examine the role of SES deprivation during different life periods in predicting PD in adulthood.

Abstract ID: 2334821

Unfolded protein response gene expression in oral squamous cell carcinoma

Benedict Seo

University of Otago

Nominated IADR Scientific Category: Oral Medicine & Pathology

Authors/Institutions: B. Seo, D.E. Coates, G. Seymour, A. Rich, University of Otago, Dunedin, NEW ZEALAND

Keywords: Oral squamous cell carcinoma, ER stress, Unfolded protein response, SREBF1.

Presenting in Session 4 - Oral Medicine and Pathology 1: Oral Cancer Research - On the Way to the Clinic, Tue 10.15-10.30am

Objectives: Endoplasmic reticulum (ER) stress orchestrates a set of cellular responses collectively known as the unfolded protein response (UPR). UPR may promote or impede disease processes depending on the degree of ER stress and the genes subsequently activated. However, the precise role of UPR in the pathogenesis of oral squamous cell carcinoma (OSCC) has not been elucidated. Objectives: To examine the regulation of UPR-related genes in OSCC and normal oral keratinocytes (NOK) *in vitro* with and without tunicamycin (TM)-induced ER stress.

Methods: Methods: OSCC (n=3) and NOK (n=3) cell lines were subjected to ER stress (TM; 2.5 μ g/ml) for 24 hours. RNA was isolated, reverse transcribed and qRT2-PCR was performed for 84 UPR genes of interest. Fold-regulation (FR; $2^{-\Delta\Delta Cq}$) of $\geq\pm 2$ with p-values ≤ 0.05 was regarded as biologically significant.

Results: Results: Without TM-induced ER stress, OSCC UPR genes showed a trend to up-regulation compared with NOK cells. In particular, SREBF1, which is involved in sterol biosynthesis and is linked to cell survival and tumour growth, was significantly up-regulated (FR=9.7, $p < 0.01$). When subjected to ER stress, UPR genes in OSCC were also up-regulated as compared to NOK cells. Up-regulated genes included the multifunctional transcription factor DDIT3 (FR=2.4, $p < 0.05$) which has been implicated in the induction of cell cycle arrest and apoptosis, as well as HTRA4 (FR=3.7, $p < 0.05$) a chaperone protease which degrades misfolded proteins and HSPA1L (FR=10.1, $p < 0.001$), a heat shock protein 70kDa family member.

Conclusions: Conclusion: The findings suggest that there is a unique and complex regulation of UPR genes in OSCC. In particular the role of SREBF1, which has been shown to be highly expressed in various malignancies should be investigated in the pathogenesis of OSCC with a view to its use as a potential prognostic marker.

Abstract ID: 2319762

Theories on social inequalities and oral health: a scoping review

Ankur Singh

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Nominated IADR Scientific Category: Global Oral Health Inequalities Research Network

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Keywords: Inequalities, Review, Oral Health.

Presenting in Session 13 - Behavioural, Epidemiologic & Health Services Research 4, Wed 11.30-11.45am

Objectives: Aims: To review the evidence on the association between area-level social inequalities and population oral health according to type and extent of social theories.

Methods: A scoping review was conducted on the studies which assessed association between any area level social inequality measure and population oral health outcomes such as self-rated oral health, number of teeth, dental caries, periodontal disease, tooth loss, Oral Health related Quality of Life (OHRQoL) and dental pain. A search strategy was applied to identify evidence on PubMed, Medline (Ovid), EMBASE, Web of Science, ERIC, Sociological Abstracts, Social Services Abstracts, references of selected studies, and further grey literature. A qualitative content analysis of the selected studies using Nvivo software was conducted.

Results: A total of 2647 hits were identified and 11 studies were included in the review. Income inequality was measure of area-level inequality amongst all studies and Gini Index as the preferred measure of income inequality in selected studies. There were 31 uses of 7 types of social theories in the selected studies including psychosocial (9), behavioural (6), neo-material (6), social capital (5), social cohesion (2), social support (2) and material (1). Amongst the selected studies 4 used theories for post-hoc explanation, only 2 explicitly tested social theories as pathways from inequalities to population oral health outcomes, 2 had some conceptual basis, 2 used a theoretical construct, and 1 had no theoretical basis. All the studies used income inequality as

the area-level measure of social inequality. All studies reported significant associations and detrimental effects of area level inequality on oral health outcomes. Conclusions: Few studies have assessed the association between an area-level social inequality and oral health outcomes. Psychosocial theories are applied most frequently. Social theories were not explicitly tested in the majority of the studies.

Abstract ID: 2343952

Dental experiences of providing dental care to mental health consumers

Linda Slack-Smith

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

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Keywords: oral health , mental health, dental professionals.

Presenting in Session 13 - Behavioural, Epidemiologic & Health Services Research 4, Wed 11.15-11.30am

Objective: Evidence suggests that mental health consumers are more likely to have poor oral health outcomes and less likely to receive appropriate dental health care, despite their high needs. Few studies have explored the experiences of dental health professionals' engagement with mental health consumers. This study investigated some of the barriers and enablers to the provision of dental care to adult mental health consumers in the Perth metropolitan area, Western Australia from the perspective of dental health professionals.

Methods: A series of in-depth qualitative interviews were undertaken with a range of dental health professionals. These examined their perspectives and practices in providing oral health services to mental health consumers.

Results: The findings from this research highlight the structural and systemic barriers within both public and private dental service systems that directly impact on the oral health care of many mental health consumers and the capacity of dental health professionals to provide an appropriate and adequate level of care. It highlights where resources and innovation is urgently required.

Conclusion: There is considerable scope for reconceptualising dental service delivery models to mental health consumers that could have enormous potential to change their dental and general health status.

Abstract ID: 2332947

Evaluating Team-based Inter-professional Clinical Education in an Australian Dental School

Mark Storrs

Griffith University

Nominated IADR Scientific Category: Education Research

Authors/Institutions: M. Storrs, J. Kroon, J. Evans, School of Dentistry and Oral Health, Griffith University, Gold Coast, Queensland, AUSTRALIA; H. Alexander, Learning Futures, Griffith University, Brisbane, Queensland, AUSTRALIA

Keywords: Inter-professional Education, Team-based Processes, Quality of Clinical Dental Education, Correlation Coefficients, Predictive Utility.

Presenting in Session 14 - Education Research: Best Practices in Clinical Teaching, Wed 10.30-10.45am

Objectives: The impact of the inter-professional team-based treatment planning (TBTP) process upon the quality of clinical dental education received at the Griffith University School of Dentistry and Oral Health (DOH) needed to be ascertained. Initially, the reliability and validity of the Inter-professional Clinical Dental Educational Outcomes Scale (ICDEOS) was established through a psychometric evaluation at DOH in 2012. This study aimed to investigate baseline associations between student TBTP processes and the quality of clinical dental education, in addition to the predictive utility of those processes

Methods: ICDEOS collected cross-sectional data on-line by targeting 258 eligible dentistry, oral health therapy and dental technology undergraduate students. Informed consent, ethical principles and follow-up maximised response. Appropriate statistical analyses described attitudes/practices/perceptions towards the TBTP process. Adjusted correlations identified significant associations and hierarchical multiple regression discovered the predictive utility and effect size of TBTP processes on the quality of clinical dental education received

Results: 158 students (61%) responded and were deemed representative. Favourable aspects about the inter-professional team process included wanting to learn about other oral health professionals (98%), being willing to share information (83%) and having a common understanding of team-based tasks (77%). Response varied between year levels and program of enrolment. A strong significant correlation existed between inter-professional shared learning and quality of clinical dental education ($r=0.642$, $p<0.000$). This association was not affected by confounding. A combined model consisting of six TBTP predictors explained 33.5% of the variance in quality of clinical dental education, $F(6, 98)=8.22$, $p<0.000$. This effect was large ($f^2=0.416$). After controlling for the effects of the remaining predictors, inter-professional shared learning accounted for 17.8% of this variance

Conclusions: Our findings are supported within the literature. The TBTP model met DOH needs, however further study is required to study these relationships over time within comparable national and international educational institutions.

Abstract ID: 2328579

Qualitative analysis of the impact of Oral Potentially Malignant Disorders on daily life activities

Jyothi Tadakamadla

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Nominated IADR Scientific Category: Oral Medicine & Pathology

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Keywords: Oral Lichen Planus, Oral Leukoplakia, Oral Submucous Fibrosis, Quality of Life.

Presenting in Session 5 - Oral Medicine and Pathology 2, Tue 11.15-11.30am

Objectives: To evaluate the impact of Oral Potentially Malignant Disorders (OPMD) on daily life activities

Methods: Patients diagnosed with Leukoplakia, Oral submucous fibrosis (OSF) and Oral lichen planus (OLP) attending the Oral Medicine clinic of Panineeya Institute of Dental Sciences & Research Centre, Hyderabad, India were invited to participate. Fifteen personal interviews and three focus group discussions (one group with OSF, one with OLP, and one with mixed conditions) were conducted in a non-clinical setting. All groups were mixed by gender, age, socio-economic status and disease severity. Voice recordings were transcribed verbatim by two independent researchers which were then translated from Telugu to English. Data coding was also performed by the same two independent researchers using NVivo software.

Results: Sample size for this qualitative study comprised 29 patients. Four themes emerged: (1) difficulties with diagnosis and knowledge about the condition, (2) physical impairment and functional limitations, (3) psychological and social wellbeing and (4) effect of treatment on daily life. Physical impairment and functional limitations was the most important theme for many of the patients and most of the interview time was spent on discussing this theme. Burning sensation on eating spicy food was the most distressing complaint reported by more than two thirds of all the patients with OSF and OLP. In addition, difficulty in eating and opening the mouth were the commonly reported limitations. Conclusions: The impacts of OPMD extend beyond physical impairment and functional limitations to aspects of daily living, notably psychological and social wellbeing. These findings emphasise the need to consider patient perspectives when making clinical decisions rather than relying solely on the clinician's judgement based on physical signs and symptoms.

Abstract ID: 2335889

Is Body Mass Index associated with dental caries? Findings from a sample of Indian school children

Santosh Tadakamadla

Griffith University

Nominated IADR Scientific Category: Cariology Research - Clinical and Epidemiological Studies

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Keywords: Dental caries, Body mass Index, Obesity.

Presenting in Session 7 - Oral Microbiology & Probiotics 2, Tue 4.15-4.30pm

Objectives: To determine the association of Body Mass Index (BMI) with dental caries in deciduous and permanent dentition among school children of semi-urban India.

Methods: A multi-stage probability sampling was used to recruit representative 11-14 year old school children of Medak District in the state of Telangana, India. After informed consent from parents, children were examined for dental caries in both deciduous and permanent dentitions using dmft/DMFT indices. Height and weight were measured and BMI calculated. Subjects were categorised as thin, normal, overweight and obese using World Health Organization growth reference for 5-19 year-olds. Questionnaires were administered to children and parents to collect information on health-related behaviour and socio-economic status (SES) respectively.

Results: The overall prevalence of dental caries in the deciduous and permanent dentition was 30.5% and 22% respectively. The BMI of 74% of the subjects was normal, while 13.1% and 13.3% were underweight and overweight respectively. The highest caries prevalence in deciduous and permanent dentition was observed in obese (10%) and normal weight subjects (30.7%) respectively. However, caries prevalence and severity in the deciduous or permanent dentition did not vary significantly between the BMI groups. The only variable that was significantly associated with dental caries was SES. Children of parents belonging to higher SES were at less risk of having dental caries when compared to those belonging to lower SES.

Conclusions: BMI was not associated with dental caries in this population.

Abstract ID: 2335345

***Streptococcus salivarius* probiotic solutions for microbial misdemeanors in the human oral cavity**

John Tagg

University of Otago

Nominated IADR Scientific Category: Oral Health Research

Authors/Institutions: J. Tagg, Microbiology and Immunology, Otago University, Dunedin, NEW ZEALAND

Keywords: Probiotics, *Streptococcus salivarius*, Oral infections, streptococcus.

Presenting in Session 6 - Oral Microbiology & Probiotics 1, Tue 2.15-2.45pm

Objectives: To determine whether probiotic applications of BLIS-producing *Streptococcus salivarius* can reduce the occurrence and severity of the pathology associated with microbial disequilibria in the oral cavity.

Methods: Candidate *S. salivarius* producing BLIS activities were first detected by deferred and simultaneous antagonism methods. Selection of the BLIS-positive probiotic strains K12 and M18 was based on a variety of tests including safety trials, adhesion assays, extended spectrum analyses and screening for virulence genes. Delivery of the BLIS-producing strains (or placebo) to human subjects was typically in a lozenge format.

Results: Our studies have shown that the use of the BLIS-producing *S. salivarius* probiotic K12 can reduce the recurrence rate of tonsillitis and otitis media in children. Probiotic K12 can colonise the nasopharynx and adenoid tissues and can also effect a reduction in halitosis severity in adult subjects. Probiotic M18 can reduce plaque accumulation and also the plaque levels of *Streptococcus mutans*. The colonization efficacy of *S. salivarius* probiotics is enhanced following depletion of the existing oral microflora, as occurs following the use of an antiseptic mouthrinse or the taking of a course of penicillin. Strain K12, the prototype *S. salivarius* probiotic has a well-documented safety record and has been granted self-affirmed GRAS (generally regarded as safe) status for unrestricted food additive applications in the USA. This strain has now been commercially available in New Zealand for more than 10 years. Ongoing studies of *S. salivarius* probiotics include the development of strains producing novel BLIS targeting both Gram-positive and Gram-negative bacterial pathogens of the oral cavity. Other investigations having an ecological focus have traced the movement of probiotic *S. salivarius* from mothers to their new-born infants.

Conclusions: Probiotics are increasingly finding important new applications in medicine and the practical application of BLIS-producing *S. salivarius* probiotics to effect oral cavity infection control is a cost effective and easily implemented strategy that does not present many of the adverse complications that are potentially associated with

chemotherapy and immunization such as resistance development, hypersensitivity and toxic reactions.

Abstract ID: 2339260

Modelling oral physiology for clinical diagnostics

Kenji Takada

National University of Singapore

Nominated IADR Scientific Category: Craniofacial Biology

Authors/Institutions: K. Takada, Faculty of Dentistry, National University of Singapore, Singapore, SINGAPORE

Keywords: oral physiology, clinical diagnosis, modelling, jaw, mandible.

Presenting in Session 10 - Craniofacial Biology 1, Tue 2.15-2.45pm

The facial cranium and its surrounding organs are the essentials both for respiration and for the consumption of food, and also crucial to our social relationship with others.

The broader community now expects dentists to deliver high quality oral health care that is well grounded in knowledge of the structure and function of the mouth/face as well as of rationales for reasonable judgement in diagnosing and treatment planning for the impaired anatomical and physiological conditions.

In my presentation, I will review a series of clinical studies which my coworkers and I have conducted over the last decade, for modelling jaw and mandibular condylar movement kinetics, new clinical diagnostic schemes of 3D soft tissue facial configurations in patients with repaired cleft lip and palates as well as those with jaw deformities, and a methodological approach for assessing the hand dexterity in simulated clinical scenes.

The information to be provided will help neuroscientists, engineers and oral health care experts understand mutually potential needs of their expertise in pioneering a new horizon for achieving the optimum oral health care.

Abstract ID: 2326197

Health promoting role of the oral health therapist

Helen Tane

Charles Sturt University

Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

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Keywords: Promoting health, oral health promotion, public health, oral health therapist.

Presenting in Session 1 - BE&HSR 1: Epidemiology, Economics and Inequalities, Mon 12.15-12.30pm

Objectives: To investigate the health promoting role of the oral health therapist in specified rural and regional areas of New Zealand and New South Wales.

Methods: Postal questionnaires were administered to clinicians practicing in three comparable areas; the Riverina, NSW Australia, the Midland and Northland areas of New Zealand. Delegates at an international oral health therapy conference were also included. Participants were asked to state where they had gained their knowledge and competency in oral health promotion, how they applied these skills at both an individual and community level, and if this activity was part of their routine clinical practice. An in-depth sequential health promotion and oral health promotion literature review spanning the decades at a local, national and international level from 1850, was also conducted.

Results: (1) The implementation of promoting oral health has not developed alongside health promotion; the public health sectors are yet to have these fundamental health promoting philosophies embedded in dental settings, (2) communities in regional and rural settings continue to suffer more and claim a higher cost in treatment of preventable oral diseases; (3) the scarce public health funds aren't being utilised to implement a focused preventive role that incorporates a multifaceted approach which is most effective; (4) oral health promotion is an integral part of gaining competencies for graduates in the BOH courses, yet the preventive role continues to be underutilized.

Conclusions: Investigating better utilization of the OHT identifies where the important health promoting role must be exemplified and expanded, enabling communities to have improved health outcomes. Oral health therapists are a vital primary oral health profession with developed skills which improve individual and community health, complementary

to, not competitive to, the role of the dentist. The study reveals new fields of preventive inquiry that should be implemented and utilized in dental settings.

Abstract ID: 2343713

Influence of a tablet-based skills trainer on preclinical restorative skills

Carol Tran

University of Queensland

Nominated IADR Scientific Category: Education Research

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Keywords: iPad, simulation, cavity preparation.

Presenting in Session 14 - Education Research: Best Practices in Clinical Teaching, Wed 09.45-10.00am

Objectives: Cavity preparation skills are traditionally taught in the simulation laboratory in the first two years of dental school. This pilot project examined the impact of a custom tablet based (iPad) simulation software app designed to enhance manual dexterity and appreciation of finger rests, fine finger movements, depth perception and force. **Methods:** At baseline, 14 first year dental students each prepared 3 cavities of specified shape (oval, circle, rectangle), depth and width in a custom designed multi

layered training block simulating tooth structure, over 45 minutes. They were then allocated randomly into two groups: Group 1 students (control) immediately prepared 2 additional preparations (shallow and deep molar occlusal cavities) for examination without any further training. Group 2 students (single play) were only allowed one attempt on each of 5 shapes using the skills training software over 45 minutes, before the final test. The students used a custom made turbine drill-shaped stylus to undertake drilling tasks on the tablet software, which was set up to replicate the training block in direct vision mode at 1.5X final magnification. Two calibrated examiners then graded all examination blocks in a blinded manner using magnification.

Results: A total of 70 cavity preparations were completed and assessed. The 2 groups were evenly matched for performance at baseline ($P=0.3985$, Mann Whitney test). The controls improved in their performance by 0.31 in their total score ($P=0.0156$), but less than those using the app, who gained on average by 0.83 (Wilcoxon matched-pairs signed-ranks test, $P=0.0078$)

Conclusions: Using the skills trainer iQUEST app reduced the number procedural errors in cavity preparation. Skills trainers may have value in student skills acquisition outside of scheduled class time, leading to greater efficiency in learning and teaching.

Abstracts from poster presentations

Abstract ID: 2338776

Keratin hydrogels: rheology and biocompatibility with rat dental pulp

Lavanya Ajay Sharma

University of Otago

Nominated IADR Scientific Category: Pulp Biology & Regeneration Research

Colgate Award entrant

Poster session: Senior, Basic Research (CSB02), Monday

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Keywords: keratin, scaffold, biocompatibility.

Objectives: To develop an injectable keratin hydrogel (KH) and investigate its biocompatibility with rat dental pulp. Methods: Extracted, purified and isolated sheep wool keratin proteins were reconstituted with deionized water (7, 10, 12, 15, 17, and 20% w/v) and 3% glycerol to form KH. The flow characteristics was assessed using a rheometer. A frequency sweep (0.1-100 rads/sec, 1% strain) was performed to monitor dynamic elastic modulus (G') and dynamic viscous modulus (G''). Based on the rheological analysis, three concentrations (15, 17, 20%), were assessed to study the effects of hydration at 37°C (10 d) and storage at room temperature (30, 90, 180 d). The optimized gel (20% KH) was implanted into rat upper molar teeth (n=7) following partial pulpotomy (AEC- 90/13). Control pulps (n=7) were treated with hard setting Ca(OH)₂. At the end of 28 d the rats were sacrificed and maxillas prepared and stained for histological evaluation of the pulp response and immunohistochemical expression of dentine matrix protein (DMP-1). Results: There was a gradual increase in G' with increasing keratin concentration with the maximum recorded for 20% KH. At this concentration G' and G'' were relatively constant representing an elastic solid-like injectable preparation. There was an approximate 13%

reduction in G' following hydration ($p < 0.01$, 't' test) but no difference following storage ($p > 0.05$, 't' test). The KH pulpotomy group showed vital pulp with a mild to moderate inflammatory response, reparative dentine-like deposits and widespread DMP-1 expression.

Conclusions: KH at 20% w/v had adequate flow characteristics for clinical application and was biocompatible with rat dental pulp.

Abstract ID: 2324888

Sheep: A suitable model for endodontic regeneration/revitalisation research

Milad Al Taii

The University of Adelaide; College of Dentistry, University of Babylon

Nominated IADR Scientific Category: Pulp Biology & Regeneration Research

Colgate Award entrant

Poster session: Senior, Basic Research (CSB03), Monday

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Keywords: Regeneration, Endodontics, Dental Pulp, animal study, Pulpal response.

Objectives: Endodontic regeneration/revitalisation treatment of immature infected teeth shows promising outcomes with further development and maturation of the teeth. However, a suitable animal model is required to investigate alternative treatment protocols and effect on healing. The aim of this study was to examine response of sheep immature teeth to a commonly used

regeneration/revitalisation and determine whether the use of sheep shows promise for further research opportunities.

Methods: Immature right first incisors in four sheep were mechanically exposed and infected for five weeks. Left first incisors remained intact as a control. After cleaning and disinfection of the experimental teeth with a triple antibiotic paste for four weeks, bleeding was induced inside the canal by mechanically irritating the periapical tissues. A collagen dressing was packed coronally on the blood clot and the canal orifice sealed with mineral trioxide aggregate. Six months later, the sheep were humanely sacrificed, the mandibles were fixed and the changes in the teeth and the periapical tissues were analysed radiographically, with CT scanning, and histologically.

Results: There were significant increases in root wall thickness and narrowing of the apical diameter after treatment ($p < 0.05$). No significant differences in teeth development found between the experimental and the control teeth (all $p > 0.1$). Histologically, three or four maturation and remodelling regions were observed in the experimental teeth depending on the severity of the previous infection. Tissue development at the apical portion of the root was more mature than the coronal portion.

Conclusions: Sheep immature teeth showed a positive response to the regeneration/revitalisation treatment similar to the findings in human case reports. The three or four maturation and remodelling regions seen in the histology sections of the treated teeth are likely to have progressed from the apical to the coronal portion of the roots.

Abstract ID: 2332761

Primary tooth pulp progenitor cells' characterisation and differentiation potential

Mohammad Alansary

University of Otago

Nominated IADR Scientific Category: Stem Cell Biology

Colgate Award entrant

Poster session: Senior, Basic Research (CSB01), Monday

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Keywords: Stem Cells, Primary Teeth, Multi-lineage Differentiation, Pulp Cells, immunocytochemistry.

Objectives: To isolate and phenotypically characterise pluripotent progenitor cells from pulps of primary teeth at different stages of root resorption and to determine their ability to retain their 'stem cell' potential *in vitro*.

Methods: Caries-free primary canine teeth at three stages of physiological root resorption were extracted from healthy participants as part of their treatment plans ($n=9$). Stem cell medium (Essential 8 - Invitrogen) was used with vitronectin as an attachment matrix for the cell culture. Immunofluorescence was used to detect the embryonic stem cell markers NANOG, SOX2 and Oct 4, the neural crest progenitor cell markers nestin and Dlx2, and the mesenchymal stem cell markers CD90, CD73 and CD105. The differentiation potential of primary pulp cells into ectoderm, mesoderm and endoderm progenitors was assessed and their ability to be induced into cardiomyocytes and neuronal progenitors cells determined. The human embryonic stem cell line GENE002 was used as a positive control.

Results: Cell lines were established from pulps at all three stages of resorption. There was no difference in the expression of embryonic stem cell markers NANOG and SOX2, neural crest progenitor cell markers Nestin and Dlx2, and mesenchymal stem cell markers CD90, CD73 and CD105 between the cell lines. Oct 4 was not expressed. All cell lines were able to be differentiated into progenitor cells of the three germ layers expressing Otx2 (ectoderm), Brachyury (mesoderm) and SOX17 (endoderm) protein markers, and into neuronal progenitors expressing Nestin, SOX1, SOX2 and PAX6 markers and cardiomyocyte progenitors showing TNNT2 and KNX2.5 markers.

Conclusions: Immunofluorescence studies on primary pulp cells showed cell populations expressing Embryonic, Neural crest, and Mesenchymal stem cell marker proteins. Differentiation experiments revealed the potential of cultured primary pulp cells for multi-lineage differentiation. There was no difference in protein expression between the cell lines.

Abstract ID: 2309509

Perceived Sources of Stress, Burnout, and Coping Strategies among Dental Practitioners in Saudi Arabia

Mohammad Albakry

Najran University

Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

Poster session: General (GP01), Tuesday

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Keywords: Dental practitioner, stressors, burnout, stress management, coping strategies.

Objectives: To assess level of stress, and identify perceived sources of stress, and coping strategies among Saudi dental practitioners.

Methods: A modified dental environment stress questionnaire was administered to 1362 dental practitioners, working in government sector.

Results: The response rate was 94.5%. The most commonly reported stressors were as follows: 1)- long working time (68%), 2)- treating anxious/difficult patients (53%) and 3)- financial concerns (49%). Some other stressors recorded also high percentage of stress causing factor, such as: equipment breakdowns (44%), falling behind schedule as a result of extra recommended cases (40%), and staff problems (33%). Although not adopted in a regular basis, coping strategies adopted to manage work-related stress included sports, relaxation, visiting friends, and forgetting about work.

Conclusions: More than one stressing factor was found to affect the work environment of Saudi dentists. Younger or newly graduate dentists showed higher level of perceived stress than other dentists. Only 37% of the stressed dentists showed awareness and knowledge of how to manage stress. Dentists should be encouraged to learn more effective coping strategies to minimize the effect of stress.

Abstract ID: 2319980

Shear-wave sonoelastography for assessing masseter muscle hardness

Yoshiko Arijii

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Nominated IADR Scientific Category: Diagnostic Sciences

Poster session: General (GP02), Tuesday

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Keywords: sonography, shear-wave sonoelastography, masseter muscle, muscle hardness, reliability.

Objectives: Shear-wave sonoelastography is expected to facilitate a reduction in operator dependency, high reproducibility, and quantitative evaluation, whereas there are few reports on available normative values of in-vivo tissue in head and neck fields. The purpose of this study was to examine the reliabilities on measuring hardness using shear-wave sonoelastography, and to clarify normal values of the masseter muscle hardness in healthy volunteers. Methods: Phantoms with the known hardness ranging from 20 to 140 kPa were scanned with shear-wave sonoelastography, and the inter- and intra-operator reliabilities were examined compared with strain sonoelastography. The relationships between the actual and measured hardness were analyzed. The masseter muscle hardness in 30 healthy volunteers was measured using shear-wave sonoelastography.

Results: The inter- and intra-operator intraclass correlation coefficients (ICCs) using shear-wave sonoelastography were almost perfect. ICCs on strain sonoelastography were high, but slightly lower than those of shear-wave sonoelastography. Strong correlations were seen between the actual and measured hardness on shear-wave sonoelastography. The mean hardness of the masseter muscles in healthy volunteers was 42.82 ± 5.56 kPa at rest, and 53.36 ± 8.46 kPa during jaw-clenching. There were no significant differences between the left and right values, and between

males and females. There were significant differences between the values at rest and during jaw-clenching.

Conclusions: The high-level reliabilities for measuring the hardness of the tissue-mimicking phantoms on shear-wave sonoelastography were confirmed. The actual and measured hardness showed a strong correlation. The hardness of the masseter muscles in healthy volunteers was provided using shear-wave sonoelastography. These may be reference values for patients with muscle pain.

Abstract ID: 2343716

Soft Tissue Dimensional Changes After Immediate Implant Placement And Restoration

Himanshu Arora

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Nominated IADR Scientific Category: Implantology Research

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC01), Monday

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Keywords: Immediate implant, Soft tissue.

Objectives: This study evaluated the correlation between pre-operative buccal cortical bone thickness and peri-implant tissue response following immediate placement and restoration of implants in the maxillary aesthetic zone

Methods: Twenty patients (5 males, 15 females) with an age range of 19-59 years requiring the replacement of a single maxillary anterior tooth were included in the study. All participating patients underwent the same treatment strategy that involved removal of the failed tooth, flapless surgery, immediate implant placement, grafting of the implant-socket gap and connection of a screw-retained provisional restoration. Three months following implant placement, the temporary crowns were replaced by the definitive restorations. Buccal cortical bone thickness was

evaluated using pre-operative CBCT scans. Intra-oral photographs were taken before implant placement (baseline) and at follow-up appointments to measure soft tissue changes around implants. Aesthetic evaluation was done using the Pink Esthetic Score (PES)

Results: All implants remained osseointegrated during the follow up period of 2 years. Mesial papilla, distal papilla, and mid-facial gingiva showed a recession 0.05 mm, 0.27 mm, and 0.14 mm respectively. PES values improved from 9.26 ± 1.79 pre-operatively to 10.74 ± 1.88 at the end of 2 years. No significant correlation was found between buccal cortical bone thickness and soft tissue or aesthetic changes

Conclusions: Within the limits of this study, no significant correlation was found between pre-operative buccal bone width and the soft tissue and aesthetic outcome following immediate implant placement and restoration in the anterior maxilla. Other factors influencing these outcomes need to be explored

Abstract ID: 2331200

Interleukin-17 induces matrix metalloproteinase activation and invasion in oral cancer

Avadhoot Avadhani

University of Otago

Nominated IADR Scientific Category: Oral Medicine & Pathology

Colgate Award entrant

Poster session: Senior, Basic Research (CSB04), Monday

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Keywords: Interleukin 17, Invasion, Oral cancer, Matrix metalloproteinase .

Objectives: To identify the role of interleukin 17 (IL17) in invasion of oral squamous cell carcinoma (OSCC).

Methods: OSCC cell lines (SCC4, SCC15 and SCC25) were stimulated with human recombinant IL17 (hrIL17) over a

range of concentrations (0, 10, 50 and 100 ng/ mL) to evaluate invasion using an *in vitro* QCM ECMatrix invasion assay. The cells were incubated with hrIL17 in an invasion chamber for 48 hours and data was collected using a Biotek Synergy2 microplate reader. The expression of genes associated with tumour metastasis at 48 hours in untreated OSCC cells and cells treated with 100 ng/ mL of hrIL17 was assessed by qPCR using a human tumour metastasis gene array. The data was analyzed using a two way ANOVA on a GraphPad Prism 6 software.

Results: HrIL17 promoted the *in vitro* invasion of SCC15 and SCC25 cells in a dose dependent manner. SCC15 cells exhibited significant invasion compared with control cells when exposed to both 50 and 100 ng/mL hrIL17 ($p < 0.05$), as did the SCC25 cells at 100 ng/mL hrIL17 ($p < 0.05$). In contrast, hrIL17 failed to stimulate invasion in the SCC4 cell line. The expression of matrix metalloproteinase (MMP)2, MMP3, MMP7, MMP10 and MMP13 was upregulated in SCC15 and SCC25 cells; whereas all MMPs were downregulated in SCC4 cells.

Conclusions: This study is the first to demonstrate an *in vitro* association between IL17 and invasion of OSCC. The exact underlying mechanisms remain to be fully elucidated, but MMPs are likely to play an important role.

Abstract ID: 2333035

A comparison between the effects of a single Parathyroid Hormone (PTH) injection on the healing of stress fractures after 2 and 6 weeks.

Mahmoud Bakr

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Nominated IADR Scientific Category: Mineralized Tissue

Colgate Award entrant

Poster session: Senior, Basic Research (CSB05), Monday

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Keywords: Stress fracture, Parathyroid hormone.

Objectives: Stress, or fatigue, fractures (Sfx), occur as a result of repetitive non-traumatic cyclic loading. They are common in professional athletes, soldiers and dancers, and repair via a process of direct remodelling. Anti-inflammatory drugs (NSAIDs), commonly used in Sfx patients, retard Sfx healing, as do bisphosphonates (BPs). Parathyroid hormone (PTH) has an anabolic effect that can accelerate bone remodelling and counteract effects of BP. Therefore, our aim was to investigate the short-term effect of a single PTH injection on the healing of Sfx.

Methods: Thirty four female wistar rats 300 g were allocated to PTH and vehicle (VEH) groups. 24 hours after Sfx, PTH group received a single dose of hPTH-(1-34) peptide (Sigma-Aldrich) ($8 \mu\text{g}/100\text{g}$) dissolved in 0.9% saline with 1% rat heat-inactivated serum. Sfx was created in the right ulna of both groups using cyclic end-loading. We used the ulnar Sfx model, allowing scrutiny of focal remodeling with a known time course and precise anatomical location. Both groups had an ulnar stress fracture induced in a single session (Figure 1). Ulnae of half of the groups were harvested two weeks after loading, the other half were harvested six weeks after loading. All ulnae were dissected, processed for histology and stained with Toluidine blue and TRAP for osteoclasts count. Histomorphometry was conducted using Osteomeasure™.

Results: There were no differences between groups for cortical area, or length of fracture. After 2 weeks: There was a trend for increased Sfx porosity (resorption), erosion and woven bone formation in PTH group; but significantly increased osteoclast number when compared to the VEH group ($P < 0.01$). After 6 weeks: There was a statistically significant difference with more woven bone and porosity areas in PTH group. Comparing the results of the 2 weeks and 6 weeks cohorts showed a significant increase in the number of osteoclasts in the 2 weeks cohort and a significant increase in healed bone area in the 6 weeks cohort.

Conclusions: These data provide evidence that a single PTH injection, 24 hours after Sfx initiation, results in active changes in dynamics of bone remodelling that may accelerate healing. Additional data is now required to

demonstrate the long-term effect on healing time, and potential for daily PTH injections on the healing of SFx.

Abstract ID: 2322872

***Pseudomonas* quorum sensors significantly enhance fluconazole resistance in *Candida albicans*.**

H.M.H.N. Bandara

The University of Queensland

Nominated IADR Scientific Category: Microbiology & Immunology

Colgate Award entrant

Poster session: Senior, Basic Research (CSB06), Monday

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Keywords: *Candida albicans*, *Pseudomonas aeruginosa*, Biofilms, Quorum sensing, Fluconazole.

Objectives: Microbial species inhabiting biofilm communities are known to exhibit complex interactions and quorum sensing is one such mechanism that contributes to their survival on host surfaces. The objective of this study was to investigate the effect of *Pseudomonas aeruginosa* quorum sensing signalling molecule, N-3-oxo-dodecanoyl-L-Homoserine lactone (AHL) on the sensitivity of *Candida albicans* SC5314 to fluconazole.

Methods: The minimum inhibitory concentrations (MIC) of fluconazole and AHL and, the effect of AHL on fluconazole sensitivity of *C. albicans* were determined by broth dilution assays. The differential regulation of *C. albicans* multidrug efflux pump activity (\pm AHL and fluconazole) was measured by rhodamine 6g assay. The differential expression genes that code of *C. albicans* multidrug resistance efflux pumps; CDR1, CDR2 and MDR1 were measured by Real-Time PCR assay and statistically analysed with Mann-Whitney-U test.

Results: *C. albicans* exhibited 8-fold increase in MIC50 for fluconazole when treated with 12.5-50 μ g/ml AHL (0.15 μ g/ml vs 1.25 μ g/ml). AHL itself did not elicit any significant effect on *C. albicans*. There was a 2-fold increase in multidrug efflux pump activity when *C. albicans* was treated with AHL. AHL+fluconazole increased the latter pumps activity by 3-fold compared with untreated controls. Both CDR2 and MDR1 genes were significantly upregulated when treated with AHL alone or AHL+fluconazole, compared with untreated controls ($P < 0.05$). CDR1 gene activity was not affected by AHL treatment.

Conclusions: *P. aeruginosa* AHL is known to inhibit *C. albicans* growth. However, this study reveals, for the first time, that AHL selectively upregulates *C. albicans* multidrug efflux pumps and their respective genes, CDR2 and MDR1, thereby increasing the resistance of the fungus to fluconazole. This mechanism may play a role in aggravating oral and systemic infections caused by *C. albicans* and superinfected with opportunistic pathogen *P. aeruginosa*. Thus, cautions must be exercised when determining therapeutics for aforementioned infections.

Abstract ID: 2319834

Porcelain Bonding To Novel 3D Printed Cobalt-chromium: A Pilot Study

Abdullah Barazanchi

Sir John Walsh Research Institute, Faculty of Dentistry, University of Otago

Nominated IADR Scientific Category: Dental Materials 1: Adhesion - Bond Strength Testing and Mechanisms

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC02), Monday

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Keywords: 3D printing, DMLS, Cobalt-Chromium, Adhesion, Porcelain-fused-to-metal.

Objectives: Adhesion energy of porcelain veneered to traditional cast cobalt-chromium (CoCr) is reported to be 44.7 J/m². Our aim is to determine the adhesion energy of porcelain veneered to direct metal laser sintered (DMLS) 3D printed CoCr alloy and to conventional machined CoCr.

Methods: Four CoCr samples were fabricated, two were printed using an Eosint M270 DMLS 3D printer (3D-CoCr) (Eos GmbH, Munich, Germany) and another two samples fabricated using electrical-discharge machining (M-CoCr). One sample from each fabrication method was veneered with porcelain. Adhesion energy testing was carried out using 4-point bending according to the method adapted by Suansuwan and Swain. An increasing load was applied to the specimen using a universal testing machine until crack propagation was initiated along the interface. The remaining two (unveneered) CoCr samples were tested using a nano-indenter to calculate the elastic modulus (Em) and hardness (h) values.

Results: Similar forces led to stable crack extension in both 3D-CoCr and M-CoCr samples (367.5 N and 362.5 N respectively). However Em and h were higher in the 3D-CoCr samples (E/b > 214.3 GPa and h 5.83 GPa) compared to M-CoCr (Em 188.8 GPa, h 3.9 GPa). Using this data, the adhesion energy was calculated to be 73.5 J/m² for 3D-CoCr and 85.4 J/m² for M-CoCr.

Conclusions: This study evaluated the adhesion energy of veneered CoCr samples fabricated using novel DMLS 3D printing technology and conventional machining. The adhesion energy of veneering porcelain to DMLS was found higher than reported adhesion energy of traditional cast CoCr, but slightly lower than the adhesion energy in machined CoCr. Thus, the properties of CoCr printed using DMLS technology, should be investigated further as these results suggest it could be a viable alternative to machined or cast CoCr for use in prosthodontics for porcelain-fused-to-metal prostheses.

Abstract ID: 2338775

Nanoengineered protein-delivery system for craniosynostosis therapy

Manpreet Bariana

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Nominated IADR Scientific Category: Craniofacial Biology

Colgate Award entrant

Poster session: Senior, Basic Research (CSB07), Monday

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Keywords: Glypicans, BMP2, Titania nanotubes (TNT), protein-delivery.

Objectives: Glypicans (GPCs) have been implicated in down regulating the activity of bone morphogenetic protein 2 (BMP2) that is found in high levels in prematurely fusing sutures in craniosynostosis. By using Dual luciferase Reporter (DLR) assay, the aim of this study was to test the functionality of the eluted GPCs from novel nanoengineered Titania nanotube (TNT) implant on BMP2 bioactivity in C2C12 cell line.

Methods: TNTs were prepared by simple two-step electrochemical anodisation of titanium foil in lactic acid containing organic electrolyte. Scanning electron microscopy (SEM) was used for morphological analysis of the nano-implant surface. TNT substrates (n=3) were then loaded with the specific glypicans (GPC1, GPC3, GPC1 + GPC3) under vacuum, followed by immersion in 500 μ l of PBS at 37°C. The amount of eluted protein was measured periodically by using a fluorimeter. The DLR assay was carried out by culturing the transfected cells in a 24 well-plate and then by treating them with BMP2 and eluted GPCs at different durations (1, 8 and 15 days). The cells were later lysed and assayed using Promega DLR assay kit.

Results: SEM showed hexagonally aligned TNTs with lengths of \sim 35 μ m and pore diameters of 120nm. There was an initial rapid elution of the GPCs (burst release), followed by a slower elution phase (sustained release) for up to 20 days. The DLR assay data showed that the released GPC3 and

GPC1 were active and repressed the BMP2 bioactivity by almost 40-50% on day 1. GPC1 and GPC3 together did not produce synergistic effect. The proteins were still functional on 8 and 15 days.

Conclusions: The GPCs released from TNTs modulate BMP2-osteogenic activity by sequestering BMP2 at the cell-surface, indicating that the nanoengineered protein-releasing TNT is a new and effective system for protein-delivery in craniofacial tissue-engineering.

Abstract ID: 2343455

Investigation of the effectiveness of D-amino acids to disrupt *Enterococcus faecalis* biofilms for root canal treatment

Victor Butnejski

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Nominated IADR Scientific Category: Microbiology & Immunology

Colgate Award entrant

Poster session: Junior (CJ01), Monday

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Keywords: *Enterococcus faecalis*, D-Amino Acids, Biofilm, Endodontics.

Objectives: *Enterococcus faecalis* is the most frequent species present in obturated root canals and plays a significant role in persistent periapical infections following root canal treatment due to its ability to form biofilms. The project's aim was to investigate the potential of D-amino acids (DAA) to disrupt or inhibit *E. faecalis* biofilm formation.

Methods: 37 *E. faecalis* clinical isolates were ranked, as strong, moderate or weak biofilm producers using a published 96-well microtitre tray protocol optimised for *E. faecalis*. 10 "strong" biofilm producers were used to test the ability of DAA to reduce biofilm growth over a period of 24,

72 hours and 6 days to simulate clinical treatment. A mixture containing 2.5nM of D-Leucine, D-Methionine, D-Tyrosine and D-Tryptophan was added at T = 0 for the 24 hour biofilm assay, T = 24 h for the 72 hour biofilm assay and T = 3 days for the 6 day biofilm assay. The experiment was repeated using a concentration of DAA of 25nM. An unpaired t test was used to determine statistical significance ($p < 0.05$) between experimental and control groups.

Results: At 24 hours, 72 hours and 6 days biofilm growth, 60%, 20% & 50% of the isolates showed a significant decrease in biofilm using a DAA at 2.5nM respectively. At a concentration of 25nM, all isolates showed a statistically significant reduction in biofilm formation for 24 hour ($59\% \pm 11.3\%$), 72 hour ($56\% \pm 10.6\%$) and 6 day ($40.7\% \pm 12.1\%$) old biofilms.

Conclusions: The presence of DAA (25nM) disrupted or reduced biofilm formation by *E. faecalis in vitro*. Incorporation of DAA into an intracanal medicament may prevent the establishment of *E. faecalis* biofilms. The inclusion of DAA into current endodontic procedures may increase the success of retreatment cases, and reduce the occurrence of secondary endodontic infection.

Abstract ID: 2331210

Periodontal-Pathogen OMVs: immune-stimulants, virulence and risk factors for Chronic Periodontitis.

Jessica Cecil

The University of Melbourne

Nominated IADR Scientific Category: Periodontal Research - Pathogenesis

Colgate Award entrant

Poster session: Senior, Basic Research (CSB08), Monday

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Keywords: Outer Membrane Vesicles, Chronic Periodontitis, *P. gingivalis*, *T. denticola*, *T. forsythia*.

Objectives: A common feature among Gram-negative bacteria is the biogenesis of outer membrane vesicles (OMVs). Once regarded as cell debris, these spherical membrane structures are now thought to play a role in microbial virulence, but are poorly studied for periodontal pathogens. The objectives of this investigation are to establish a reliable OMV isolation and enumeration protocol and evaluate OMV-associated virulence factors and the pattern-recognition-receptors they stimulate. Evaluation of how OMVs stimulate the immune response will increase our understanding of how chronic periodontal disease progresses and this in turn may improve diagnosis and treatment of disease.

Methods: This study developed a highly effective purification and enumeration technique to isolate OMVs from *Porphyromonas gingivalis*, *Treponema denticola* and *Tannerella forsythia* using density gradient separation and high resolution flow cytometry. Highly purified OMVs were characterised to identify their biophysical/chemical components and evaluate their ability to stimulate the innate immune system via pattern recognition receptors using HEK-Blue[®] cell lines stably transfected with TLR and NOD receptors.

Results: The optiprep and enumeration methods used in this study were found to significantly improve characterisation and bioassays compared to reported methods for OMV isolation. OMVs from all three bacteria were found to contain variety of PAMPs including lipoproteins, lipopolysaccharide, peptidoglycan, DNA and RNA. OMVs from all three bacteria stimulated a significant TLR2 and TLR4 response. In addition OMVs from *P. gingivalis* and *T. forsythia* induce moderate/weak TLR7, TLR8, TLR9, NOD1 and NOD2 responses, respectively.

Conclusions: Our data clearly demonstrates that OMVs from periodontal pathogens possess a multitude of virulence factors and are major stimulants of PRRs likely to have a significant impact on the development and continuation of the inflammatory response in periodontal disease.

Abstract ID: 2315487

Vision: a study of clinical dental teachers

Nicholas Chandler

University of Otago

Nominated IADR Scientific Category: Education Research

Poster session: **General (GP03), Tuesday**

Authors/Institutions: N. Chandler, C.M. Murray, Oral Rehabilitation, University of Otago, Dunedin, NEW ZEALAND; A. Gray, Preventive and Social medicine, University of Otago, Dunedin, NEW ZEALAND

Keywords: education, vision, clinical teachers, eye care.

Objectives: The aim was to investigate the vision of dental teachers involved in patient treatment and/or simulation teaching.

Methods: Ethical approval was obtained and a questionnaire-based survey of all 90 teachers was conducted. Data were screened and analyzed in Stata 13.1. The chi-square and Fisher's Exact tests were used to test for significance with an alpha level of 0.05.

Results: The participation rate was 95.6%. Of the 97% who had been tested at some stage, 15% had their eye examination due to sight deterioration with 22% needing correction. Some 49% wore spectacles only, with 18 (22%) of this group alternating between spectacles and contact lenses. While 4% had had laser surgery, a further 27% were interested. Almost two-thirds were myopic, and a third were hyperopic. Four participants reported they were colour blind. Of those with corrected vision, 80% followed their optometrist's recall advice. Almost all (92%) thought their eyesight was satisfactory to practice dentistry. Magnification was used by 72% with no significant differences between genders ($p = 0.471$), age of participants ($p=0.672$), place of qualification ($p=0.524$) or registration status ($p=0.632$). Most teachers (81%) thought that screening of dental students' eyesight should be mandatory. Regular eye examinations as a condition of practice was supported by 67%.

Conclusions: The teacher group was conscientious regarding eye care, irrespective of their maturity or training. Their uptake of magnification was high. They considered that

screening of students' eyesight should be mandatory and supported eye tests for practitioners as a component of conditions of practice.

Abstract ID: 2308042

Intraoral pH and Temperature During Sleep

Joanne Jung Eun Choi

University of Otago

Nominated IADR Scientific Category: Craniofacial Biology

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC03), Monday

Authors/Institutions: J. Choi, N. Waddell, K. Lyons, M. Farella, J. Kieser, Sir John Walsh Research Institute, University of Otago, Dunedin, NEW ZEALAND

Keywords: Intraoral pH, Intraoral temperature, Dental erosion, Sleep, Mouth breathing.

Objectives: To measure and compare the intraoral pH and temperature of individuals during sleep with and without mouth breathing.

Methods: Ten healthy participants (five males, five females, mean age=25.8 (\pm 4.3)) wore a custom made appliance fitted with a pH probe (ResTech Corp., USA) and thermocouple (Lascar Electronics Inc., USA) for two sets of 48 hours (minimum of one week between each set). Continuous pH and temperature measurements were taken from the palatal aspect of the upper central incisors. To simulate mouth breathing during sleep, participants wore a noseclip (Speedo, USA) for two nights out of the four, with the first group of participants (n=5) wearing the noseclip during the first night and the rest (n=5) wearing the noseclip during the second night of sleep to balance any potential bias from the First Night Effect. Both qualitative and quantitative analysis were conducted.

Results: The mean intraoral pH during daytime was 7.3 (\pm 0.4) and during sleep was 6.8 (\pm 0.5). The mean intraoral pH during sleep with and without mouth breathing was 7.0 (\pm 0.5) and 6.6 (\pm 0.5) respectively, which was statistically

significant ($p=0.004$). The intraoral pH decreased slowly over the hours of sleep in all participants. When sleeping with forced mouth breathing, intraoral pH showed a greater fall over a longer period of time, compared to sleeping with normal breathing. The mean intraoral temperature was 33.2°C (\pm 5.1) during daytime and 33.3°C (\pm 5.9) during sleep, with no statistical significance between sleep with and without mouth breathing ($p \geq 0.5$).

Conclusions: The results suggest that mouth breathing during sleep is related to a decrease in intraoral pH compared with normal breathing during sleep, and this has been proposed as a causal factor for dental erosion and caries.

Abstract ID: 2344089

Antimicrobial activity of silver nanocomposite against oral micro-organisms

Gemma Cotton

University of Otago

Nominated IADR Scientific Category: Cariology Research - Microbiological Studies/Biofilm

Colgate Award entrant

Poster session: Senior, Basic Research (CSB09), Monday

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Keywords: Antimicrobial, Silver Nanocomposite, Oral bacteria, Microbiological assay .

Objectives: Silver-nanocomposites (AgNC) offer molecular versatility as antimicrobial agents for dental applications. This study aimed to assess the potential of a prototype AgNC to reduce the bio-burden within the oral cavity. Methods: Aqueous suspensions of AgNCs were prepared by a micelle templated synthesis, using sodium dodecylsulfate . Seven bacterial species were assessed for sensitivity; *Staphylococcus oxford*, *Escherichia coli*, *Pseudomonas*

aeruginosa, *Streptococcus mutans*, *S. mitis*, *S. gordonii* and *Enterococcus faecalis*. The well diffusion assay was used to assess inhibition of bacterial growth by AgNCs. Real-time bactericidal assays were performed at a range of AgNC concentrations over 3 hrs, using the BaLight fluorescent viability stain. Viability (fluorescence) was measured at 15 min intervals in a microtitre plate reader maintained at 37°C.

Results: Previous well diffusion assays demonstrated that growth for all bacteria tested was inhibited at silver concentrations of 7- 10 μ g/ml. Subsequent minimum bactericidal concentration (MBC) determinations by fluorescence viability indicated that for *S. gordonii*, *E. coli* and *S. mutans* 27.95 μ g Ag/ml killed \geq 90% within 15 minutes; for *S. mitis*, *E. faecalis*, *P. aeruginosa* and *S. oxford* a concentration of 55.9 μ g Ag/ml killed \geq 70% within 15 minutes. A concentration-dependent antimicrobial effect was observed across all bacterial. BaLight live/dead stain was shown to be a good quantitative technique for establishing the efficiency of the supplied AgNC product. AgNCs were composed of 400-800 nm assemblies of uniform-sized (50-70 nm) micelle aggregates (determined by electron microscopy) with shelf-life of > 1 year .

Conclusions: We have demonstrated the use of a potential oral medicament, displaying superior oligodynamic properties, at effective silver concentrations achieving bacterial killing in a 15 min time frame. These promising antibacterial results support the potential use of AgNCs for treatment of oral infections.

Abstract ID: 2350673

The periodontal health status of students in a school for the hearing impaired in Suva, Fiji

Octavian Detenamo

Fiji National University

Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

Poster session: General (GP04), Tuesday

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Keywords: Periodontal health status, Hearing impairment, CPITN.

Objectives: To determine the periodontal health status amongst students attending Gospel School of the Deaf, Suva and compare results with those without hearing difficulty from the same age group from the 2004 National Oral Health Survey (Fiji).

Methods: A modified WHO oral examination form was used to examine a sample size of 44 students, aged 5-18 years, attending Gospel School of Deaf, Suva. Three fifth year students from the Fiji National University were calibrated before conducting oral examination (Kappa value 0.85). The main indices used were CPITN, Simplified- Oral hygiene index, tooth mobility and gingival recession index. EpiInfo software program was used to enter and analyze survey data.

Results: The prognosis on information acquired from Gospel school of the deaf showed considerable worsening of periodontal health status with increasing age and increased plaque accumulation levels with increasing age. Calculus dominated the periodontal problems across all age groups (5-11, 12-14, 15-18). There was absence of tooth mobility and gingival recession. Data collection is in progress.

Conclusions: Periodontal health status worsens with increasing age and these findings were similar to those from the National Oral Health Survey 2004. The students with hearing impairment have poorer periodontal health status compared to those without hearing difficulty, with the ratio being 60% versus 40% with healthy periodontal sextants. Calculus dominates for both age groups (12-14, 15-18) in both populations.

The participants with hearing impairment have poorer periodontal health status as compared to those without hearing difficulty.

Abstract ID: 2335558

Three-dimensional high-resolution surface texture analysis of early enamel erosion

Anh Diep

University of Adelaide

Nominated IADR Scientific Category: Craniofacial Biology

Colgate Award entrant

Poster session: Junior (CJ02), Monday

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Keywords: Dental erosion, Erosion depth, Surface roughness, Profilometry, Nanotechnology.

Objectives: Most existing techniques are capable of detecting profilometric changes in enamel erosion after 7 to 10 minutes of erosive demineralisation. The aim of this study was to assess the effect of short, repetitive erosive challenges on the erosion depth and surface roughness of enamel under conditions simulating an acidic diet. Methods: Polished enamel surfaces of human third molar teeth ($n = 7$) were deposited with chrome coating by using a technique borrowed from automotive plastic mirror coating. The specimens were subjected to repetitive erosive challenges at pH 3.0 at three stages, including baseline ($t = 0$ sec), stage 1 ($t = 10$ sec) and stage 2 ($t = 20$ sec). Changes in the erosion depth, average roughness (Ra) and core roughness (Rk) values were assessed longitudinally on three-dimensional reconstructions using Laser Confocal Microscopy at a magnification of $\times 100$.

Results: Repeated measures one-way ANOVA confirmed the significant effect of stage on both erosion depth and surface roughness ($p < 0.05$), with significant increases occurring in the erosion depths from baseline to stage 1 by 26.1 ± 18.3 nm (mean \pm SD), and then from stage 1 to stage 2 by 22.5 ± 21.1 nm ($p < 0.05$). Increasing trends were observed in the mean average surface roughness (Ra) values from baseline to stage 1 by 4.1 ± 2.9 nm, and then from stage 1 to stage 2 by 5.7 ± 4.2 nm ($p < 0.05$). The mean core roughness (Rk) values also increased from baseline to stage 1 by 0.3 ± 0.2 nm, and then from stage 1 to stage 2 by 0.4 ± 0.4 nm ($p < 0.05$).

Conclusions: This is the first detailed study to demonstrate nanoscale changes in the enamel surface texture simulating realistic in vivo timelines, and it has the potential to lead to

the development of new clinical diagnostic tools and management strategies.

Abstract ID: 2328995

Learning Motor Skills In Dentistry: Comparing Different Approaches

Mohamed El-Kishawi

The University of Adelaide

Nominated IADR Scientific Category: Education Research

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC04), Monday

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Keywords: Endodontics, Implicit learning, Pre-clinical, Fine motor skills, Dental education.

Objectives: There is limited evidence available to inform the design of effective learning activities for fine motor skills used in root-canal preparation. Recent evidence from outside dentistry indicates that learning implicitly (e.g., through minimising errors or guided-observation) results in the maintenance of performance under multi-tasking or stressful conditions, in contrast to learning explicitly (e.g., instructed-observation). Therefore, this study evaluated the effect of learning approaches, consistent with implicit or explicit learning, on the acquisition of root-canal hand-instrumentation skills.

Methods: Novice dental students learnt endodontic hand skills by preparing standardised canals of different diameters and curvatures. Learning methods involved minimising (errorless: $n=21$) or maximising errors (errorful: $n=21$), or guided- ($n=23$), instructed-observation ($n=23$), or observation-only ($n=13$). Students who had completed the normal pre-clinical activities provided comparative data

(n=33). During testing, all participants prepared the distal canal on a plastic tooth, then completed the same task under multi-tasking or stressful conditions. Performance was assessed by preparation accuracy and completion time. Repeated measures ANOVA and post-hoc analyses were used to assess differences within and between groups.

Results: Performance by the experimental groups was similar during learning. When tested, errorful learners showed a deterioration in preparation accuracy when multi-tasking ($p<0.05$). Completion times for the observation-only group were longer than the comparative group when multi-tasking and under stressful conditions ($p<0.05$). However, preparation accuracy did not differ significantly within or between the experimental observation and comparative groups ($p>0.05$).

Conclusions: Our findings show that learning endodontic skills implicitly, i.e. under conditions that limit errors, resulted in stable performance when multi-tasking. This may be explained by reduced use of working memory for error management when learning. Furthermore, performance following learning without instructions was comparable to learning with instructed observation. Alternative approaches to learning motor skills in dentistry need investigating as they may provide better outcomes, especially in stressful environments.

Abstract ID: 2334433

Vital pulp therapy; When, How, Why? - A NZ PBRN study

Lara Friedlander

University of Otago

Nominated IADR Scientific Category: Network for Practice - based Research

Poster session: General (GP05), Tuesday

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Keywords: Clinical research, Dental pulp exposure, Dental caries, Pulp capping, Vital pulp therapy.

Objectives: Vital pulp therapy (VPT) in permanent teeth is recommended for some cases of deep caries and pulp exposures, and practice based research networks (PBRN) can answer questions which are relevant to populations. This study investigated the practices and philosophies of New Zealand (NZ) general dentists to VPT.

Methods: A mixed-methods approach using a questionnaire and focus-group (FG) discussions collected data on perceptions, case selection, treatment protocols and outcomes from 21 clinicians throughout NZ who engaged with the PBRN. Questionnaire data was analysed using descriptive statistics and main themes were identified from FG data.

Results: Clinicians from main and regional centres, with varying clinical experiences and providing care to different demographic groups participated. VPT was common (20/21) and viewed as a viable and successful treatment for patients of all ages in selected cases of reversible pulpitis. Treatment planning was influenced by the reason for VPT (carious/traumatic), health of the pulp (21/21), cost (19/21) and third-party funding (15/21). VPT protocols for carious and non-carious cases were different, with better outcomes following trauma. For deep caries, avoiding exposure and indirect pulp-capping (IPC) (17/21) was preferred to direct pulp-capping (DPC), which was perceived to have a poorer prognosis. DPC (20/21) or partial-pulpotomies (8/21) were performed for traumatic exposures. For evidence-based reasons and experience, Glass ionomer cement (GIC) was the most common material for IPC (14/20), while Mineral trioxide aggregate (MTA) and calcium hydroxide sealed with GIC were preferred for DPC and partial-pulpotomies. MTA (18/21) was considered to have the best outcome for DPC but cost, handling and tooth discolouration were identified barriers to use (10/21). Coronal seal was essential for all VPT. Follow-up times were inconsistent and often depended on the reason for treatment.

Conclusions: NZ dentists share similar philosophies and practices related to VPT. Treatment is influenced by case selection, financial cost and coronal seal.

Abstract ID: 2332832

Validation of Quantitative Light-induced Fluorescence-Digital (QLF-D) for quantifying hypomineralised lesions

Karla Gambetta-Tessini

The University of Melbourne

Nominated IADR Scientific Category: Mineralized Tissue

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC05), Monday

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Keywords: Fluorescence, Enamel, Hypomineralization.

Objectives: Quantitative light-induced fluorescence is a non-invasive technology used to quantify changes in fluorescence of demineralised enamel compared with surrounding sound enamel. The aim of this study was to determine the validity of QLF-D in regards to detection and severity of hypomineralised enamel lesions (HE) *in vitro*, using μ CT mineral density (MD) as the reference standard.

Methods: Twenty-two first permanent molars with HE were collected. Immediately after extraction, molar teeth were cleaned and stored in deionised water supersaturated with thymol. Lesions were analysed individually, creamy/white lesions (CW; n=6); yellow/brown lesions (YB; n=11) and post-eruptive breakdown (PEB; n=7). Control was the adjacent cervical sound enamel. Teeth were scanned using a SkyScan-1172 high-resolution μ CT and MD calculations were performed using CT-Analyser. This study used the QLF-D BiluminatorTM and its software programs for calculating fluorescence change (ΔF) and red fluorescence (ΔR). Mixed models with Sidak's post hoc analysis and Pearson's correlations were computed. Alpha level was set at 0.05. SPSS v 22.0 was used for analysis.

Results: Mineral density mean values by HE category compared to sound enamel were statistically different ($p < 0.001$). Analyses found that CW showed lower ΔF than YB and PEB ($p < 0.05$). Red fluorescence was emitted by the

majority of HE and mean differences between HE types for ΔR were also significant ($p < 0.001$). A positive correlation was found between MD and ΔF ($r = 0.434$; $p < 0.05$). The model indicated that for one unit increasing in MD there is a 0.005 increment in ΔF with a statistical significance of $p = 0.034$.

Conclusions: The correlation between MD and ΔF is weak. However, this study supports QLF-D as a method to detect HE of different severity, confirming that the clinical aspects of HE are associated with fluorescence loss. Also ΔR is putatively related to severity of HE and further exploration is recommended.

Abstract ID: 2344572

The molecular basis of triazole inhibition of an antifungal target

Danyon Graham

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Nominated IADR Scientific Category: Microbiology & Immunology

Colgate Award entrant

Poster session: Junior (CJ03), Monday

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Keywords: triazoles, candida, aspergillus, antifungal.

Objectives: Triazole antifungals are widely-used and well-tolerated fungistatic drugs that prevent production of the fungal-specific sterol ergosterol by inhibiting lanosterol 14 α -demethylase (Erg11p). Immunocompromised patients experience recurrent and life-threatening infections by fungal pathogens such as *Candida albicans* and *Aspergillus fumigatus*. Mutations in Erg11p reduce susceptibility to triazole drugs, limiting therapeutic options. This study investigated the functional effects of two common, clinically-relevant mutations (Y140H and I471T) in *Saccharomyces cerevisiae* Erg11p (ScErg11p) using cell-based analysis of antifungal susceptibility.

Methods: Mutants were constructed using PCR-based site-directed mutagenesis of the ScERG11 open-reading-frame. Gel-purified transformation cassettes encoding Y140H, I471T, or Y140H+I471T were transformed via homologous recombination into the hyper-expressed PDR5 locus of a host *S. cerevisiae* strain. Genomic DNA was extracted from selected transformants and the PDR5 locus was sequenced to confirm integration of transformation cassettes. Triazole susceptibilities of control wild-type and mutant cells were measured for short-tailed (fluconazole and voriconazole) and long-tailed (itraconazole and posaconazole) triazoles.

Results: The MIC₈₀ of Y140H cells for fluconazole was two-fold higher than wild-type cells ($p < 0.01$, ANOVA). Addition of the I471T second-site mutation further increased the MIC₈₀ for fluconazole and voriconazole three-fold ($p < 0.001$ and $p < 0.01$, ANOVA). Cells expressing the Y140H and I471T mutations individually and collectively retained wild-type susceptibility to long-tailed triazoles.

Conclusions: Substitution of Y140 with histidine modifies water-mediated hydrogen bonding to the hydroxyl group within the head of fluconazole. Long-tailed triazoles lack the comparable hydroxyl group and therefore their binding to ScErg11p was unaffected by Y140H. The Y140H+I471T mutations may alter the haem plane, preventing the stable binding of short-tailed triazoles. The linkage between the triazole head group and the rest of the drug, together with a long tail, may stabilise triazoles in the binding cavity of Erg11p, limiting the desensitising effect of the double mutation. These findings will contribute to the development of next-generation triazoles.

Abstract ID: 2309426

Methodologies for measuring the setting times of Mineral Trioxide Aggregate and Portland Cement products used in dentistry

William Ha

University of Queensland

Nominated IADR Scientific Category: Dental Materials 9: Other Materials - Chemistry, Properties and Performance

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC06), Monday

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Keywords: Mineral Trioxide Aggregate, Portland cement, particle size, setting time, rheology.

Objectives: The current standard used to measure setting time for Mineral Trioxide Aggregate (MTA) involves indentation testing with arbitrary weights. This study aims to compare indentation testing against rheological measurements and assess the influences of particle size and the inclusion of bismuth oxide on the setting time of MTA and Portland Cement (PC).

Methods: Two PCs (P1 and P2) of different particle sizes were produced using the same clinker. From these two PCs, two MTAs (M1 and M2) were created with the addition of bismuth oxide. Particle size distributions were assessed using laser diffraction analysis. Indentation setting time tests were performed in accordance to #57 ADA C266-03 ASTM. Elastic modulus was assessed using a strain-controlled rheometer at 1 rad s⁻¹ and an applied strain of 0.01%. Results: P1, P2, M1, M2 cements had median particle sizes of 6.1, 12.5, 6.5 and 13.0 μ m respectively. Using indentation testing, final setting times were ranked P1 < M1 < P2 < M2. The ranking of the final setting time corresponded with the rheological assessment of time required to reach 95% of the elastic modulus plateau. Conclusions: The time to reach 95% elastic modulus plateau of 9.3 minutes corresponds to a time close to the point where the material can be overlaid with another restorative material to give a final restoration. The 95% plateau value for elastic modulus may be a more useful parameter for determining how the setting reaction of PC and MTA cements progress over time.

Abstract ID: 2338811

Microstructured titanium surfaces induce osteoblast paracrine signalling.

Stephen Hamlet

Griffith University

Nominated IADR Scientific Category: Implantology Research

Poster session: General (GP06), Tuesday

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Keywords: Osteoblast, Cytokine, signaling, implant.

Objectives: Titanium implants with micro-rough surface topography widely used for dental and orthopaedic purposes have been shown to exhibit early osseointegration. However, the underlying mechanisms are not fully understood and require further investigations to determine the molecular signalling pathways leading to improved implant integration. Thus, identifying key factors released by osteoblasts on contact with implants will shed significant light on the biological response induced by the microstructured titanium surface. This study focused on the paracrine factors released in response to titanium surface topographical cues.

Methods: Primary osteoblasts were seeded on smooth (SMO) and sand-blasted, large grit, acid-etched (SLA) titanium discs and cultured for 48hrs. The culture media containing the secreted factors was subsequently used as a conditioned media to assess its effect on osteoblast function and bone marrow derived mesenchymal stem cell migration *in vitro*.

Results: Conditioned media from the SLA surface induced a significant increase in ALP activity in primary osteoblasts cultured on tissue culture plates, indicating a paracrine effect. BMP-2 a known osteoblast paracrine factor was found to be significantly upregulated on the SLA surface at the gene and protein level. Gene expression analysis and ELISA showed increased expression of MCP-1 in response to the SLA surface. Furthermore, chemotaxis assays revealed an increase in the migration of bone marrow derived

mesenchymal stem cells (BM-MSCs) towards conditioned media from the titanium surfaces.

Conclusions: Taken together this data suggests that paracrine factors released by osteoblasts following attachment to surface modified titanium promotes the migration BM-MSCs and induces osteogenic markers in primary human alveolar derived osteoblasts.

Abstract ID: 2335048

The understanding of Vital Pulp Therapy in a Dental Faculty.

Suzanne Hanlin

University of Otago

Nominated IADR Scientific Category: Education Research

Poster session: General (GP07), Tuesday

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Keywords: Education, dental, Faculty, dental, Dental pulp capping, Vital pulp therapy, Problem solving.

Objectives: Teaching of Vital Pulp Therapy (VPT) occurs throughout 2nd-4th year of the Bachelor of Dental Surgery (BDS) curriculum at Otago University (OU), New Zealand. This study explores the congruences of understanding and experiences of VPT within undergraduate students (BDS4, BDS5) and tutors in the Faculty of Dentistry.

Methods: Mixed-method design involving the use of questionnaire and focus group (FG) discussions was used to gather data. Chi-square (X²) (questionnaire) and thematic analysis (FG) was used to analyse data.

Results: BDS4/5 students (97) and tutors (16) participated in the questionnaire (response rates 55%, 36%). BDS4 (13) and BDS5 (15) students and tutors (12) engaged in FG discussions. All tutors were OU graduates with various years of teaching experience (50%, 5-10 years). Students and tutors understood case selection, VPT and the need for follow-up. In both groups practice philosophies were

influenced by prior and continued learning and clinical experience. Most tutors had evidence-based understanding for managing deep caries and pulp exposures. Over half of students (54.6%) had experience of exposing a pulp which led to anxiety in most. BDS5 were significantly calmer (X², P=0.03) and more confident (X², P=0.02) than BDS4 and these factors were influenced by student perceived level of knowledge and clinical experience. Students mostly used calcium hydroxide for direct pulp capping, while mineral trioxide aggregate (MTA) was the material of choice for tutors and perceived by both groups to have best healing outcomes. Students highlighted the importance of preparedness, previous experience and tutor support, while tutor identified challenges in supporting students' translation from theory to clinical practice, critical thinking and independent problem-solving.

Conclusions: Tutors and students understand VPT, emphasising the importance of evidence-based practice. Student clinical experience of VPT is limited and can cause anxiety. Successful application of VPT depends on support from tutors.

Abstract ID: 2328445

Evaluation of a web-based oral health education program at workplace developed with health professionals' feedback: a pilot study

Satoru Haresaku

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Nominated IADR Scientific Category: Education Research

Poster session: General (GP08), Tuesday

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Keywords: oral health education, internet, workplace.

Objectives: In Japan, regular visits to a dental clinic for dental checkups is not as common as in other developed countries. Oral health education at workplace therefore becomes important, and it can effectively prevent periodontal disease. However, it is often time-consuming to evaluate workers' oral health and educate oral health to them at the workplace. To tackle this, a new web-based oral health education program was developed based on feedback by health professionals. The present study aimed to conduct the new program and to assess participants' opinion of and satisfaction with the program.

Methods: Invitation e-mails were sent to all workers (n = 172) in a private company, of which 20 wished to participate. They were given the manual of web-based oral health education and a dental and hand mirror. They accessed the website at home using their own computer, tablet computer or smartphone. They self-evaluated their oral health using the mirrors and inputted the relevant data in the website, which gave them advices on oral health behaviour modification corresponding to their oral health condition. Afterwards, at their workplace, 14 workers (8 men, 6 women; mean age, 48 ± 8.8 years, 6 of 20 workers dropped) received feedback oral health consultation from a dentist and instructions from a dental hygienist corresponding to inputted data. Their opinions and satisfactions were assessed using a questionnaire.

Results: More than half of participants were satisfied with the time spent for and contents of the program, and 79% were more satisfied with the new program than a usual program which is only dentists' consultation and dental hygienists' instruction. No participant was unsatisfied.

Conclusions: This web-based oral health education program developed with health professionals' feedback satisfied participants. More research will be needed to examine the effect of this program on the oral health of workers.

Abstract ID: 2322719

Bending affects surface and mechanical properties of Stainless-Steel wire

Yan He

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Nominated IADR Scientific Category: Dental Materials 8: Metal-based Materials

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC07), Monday

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Keywords: stainless steel, orthodontic force, flexural test, surface roughness.

Objectives: The aim of this study was to investigate the corrosive behaviour of stainless-steel (SS) orthodontic wires in a more clinical relevant way by bending and exposing to various pH.

Methods: Rectangular SS wires (n=120, 0.43x0.64mm) were randomly assigned into 4 groups, each containing 15 bent and 16 straight wires. Wires in group 1-3 were exposed to artificial saliva at pH 5.6, 6.6 and 7.6 respectively and wires in group 4 were kept in air. 4 weeks later, surface roughness (Ra-value) was measured by a profilometer. Young's modulus and maximum force were determined by a four-point flexural test. Scanning electron microscopy (SEM) was used to observe surface morphology. Differences were examined using ANOVA, p<0.05.

Results: Ra-value of bent wires was significantly higher than that of straight wires in all groups (p<0.000), where straight wires in group 4 showed $(8.2 \pm 0.9) \times 10^{-2} \mu\text{m}$ (the lowest) and bent wires in group 1 (pH 5.6) showed $(24.1 \pm 4.5) \times 10^{-2} \mu\text{m}$ (the highest). Young's modulus was distinctively reduced after bending (p<0.000). In group 4 Young's modulus of straight wires was $496 \pm 18.62\text{GPa}$ and that of bent wires was $345 \pm 85.90\text{GPa}$. This discrepancy between bent and straight wires remained and enlarged in groups of various pH. Maximum force of bent wires was significantly higher than that of straight wires throughout 4 groups. Yet pH didn't make significant influence on maximum force in either bent or straight wires. Bigger surface irregularities were observed on SEM pictures of straight wires immersed in pH5.6 compared to other pH values (p<0.05). The influence of pH on surface roughness quantified by 3D

construction of SEM images was consistent with the surface roughness measured by profilometer. Conclusions: Bending has a significant influence on surface roughness and mechanical properties of rectangular SS wires. pH plays a synergistic effect on the change of mechanical properties of SS wires along with wire bending.

Abstract ID: 2343710

Periodontal treatment needs of Down syndrome individuals attending two specialized institutions in Nuku'alofa, Tonga.

James Heimuli

Fiji National University

Nominated IADR Scientific Category: Periodontal Research - Diagnosis/Epidemiology

Colgate Award entrant

Poster session: Junior (CJ04), Monday

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Keywords: Periodontal disease, treatment needs, Down syndrome.

Objectives: The objective of this cross-sectional survey was to determine the periodontal treatment needs of Down syndrome individuals who were institutionalized in Nuku'alofa, Tonga.

Methods: A total of 30 Down syndrome individuals (2-48 years) were enlisted from two specialized institutions in Tonga. The periodontal status of each participant was assessed using the basis of Community Periodontal Index of Treatment needs and the treatment needs of each sextant was categorized on highest code recorded.

Results: 74.95% of the sextants need complex treatment which includes supra and subgingival scaling, root planning and the introduction of antimicrobial agents. About 7.2% of the sextants required both oral hygiene instructions and prophylaxis with 17.22% of the sextants were healthy and needed no treatment. Complex periodontal treatment

needs were evident at 14-19 years of age and 21-26 year olds had the highest periodontal treatment needs.

Conclusions: In Tonga, Down syndrome individuals are destined to serious periodontal diseases if they are not detected at an early age. A comprehensive periodontal assessment and interdisciplinary management is needed to meet the periodontal needs of this vulnerable group.

Abstract ID: 2320203

Experimental study on metal artifacts around dental implants

Ryo Hikita

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Nominated IADR Scientific Category: Diagnostic Sciences

Poster session: General (GP09), Tuesday

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Keywords: CBCT, artifact, dental implant.

Objectives: Metal artifacts caused by dental implants affect and change the voxel values around implants on images obtained using cone-beam computed tomography (CBCT) for dental use. However, some structures can still be observed on CBCT images in spite of these artifacts. In the present study, we comprehensively analyzed the relationship between the changes in the voxel values around implants and the subjective visibility of simulated lesions. Methods: A titanium rod (diameter: 4mm; length: 40mm) was inserted in the areas corresponding to the anterior and posterior regions of the dental arch in a cylindrical acrylic vessel with a diameter of 150mm filled with water. This was followed by, scanning with a CBCT machine (Alphard VEGA, Asahi Roentgen Industry, Kyoto, Japan). Data were saved in the DICOM format and the changes were analyzed using software (Osirix, The OsiriX Foundation, Geneva, Switzerland).

For lesion simulation, holes with diameters of 0.3mm, 0.5mm, and 1.0mm were drilled onto aluminum tubes with

various diameters. The tubes were then scanned with the titanium rod inserted into the center of the tubes. Two observers subjectively evaluated the visibility of the holes.

Results: The voxel values around the implant changed depending on the direction of the metal artifacts. These changes also differed between areas corresponding to the anterior and posterior regions of the dental arch. Similar results were obtained from the observer evaluations.

Conclusions: The results of the present study confirmed directionally-dependent changes in the artifacts caused by dental implants, and indicated a possibility of detecting lesions even in an area affected by the artifacts.

Abstract ID: 2328507

Prefrontal cortical hemodynamic response associated with pain in the gingiva

Kyoko Inamoto

Aichi Gakuin University

Nominated IADR Scientific Category: Neuroscience

Poster session: General (GP10), Tuesday

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Keywords: functional near-infrared spectroscopy, prefrontal cortex, experimental pain, gingiva.

Objectives: Pain is described as 'an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage'. Both sensory and emotional components should be considered in pain treatment. The purpose of this study was to evaluate prefrontal cortical hemodynamics associated with experimental pain stimulus using functional near-infrared spectroscopy (fNIRS) (ETG-4000; Hitachi Medical Co., Tokyo, Japan).

Methods: Twenty-eight right-handed healthy male volunteers (mean age: 26.5 years) participated in this study. The participants were told that an experimental pain

stimulus (task) would be administered, twice, for 1 min each time. For pain stimulus, an accessory point was inserted in the gingival sulcus of the right upper central incisor. The measurements started with a 3-min rest followed by the first task, then another 1.5-min rest interval before the second task. Without prior participant knowledge, the investigator only pretended to insert a point in the gingiva in the first task (placebo task), and pain stimulus was applied during the second task (pain task). Analysis was conducted on 22 channels across the prefrontal cortex. Oxy-Hb concentration changes were determined in each channel by calculating the differences between the mean value at rest and the mean value of first task, and between the mean value at rest and the mean value of the second task. Analysis of significant differences of first and second task data was performed by paired t-test with Bonferroni corrections. Periodontal pain intensity was measured using visual analogue scales (VAS).

Results: Mean VAS scores were 0.04 ± 0.12 (first task) and 2.74 ± 1.84 (second task). There was no significant ($p < 0.05$) difference in oxy-Hb between the first and second tasks in the 22 channels.

Conclusions: These data suggest even if the experimental stimulus was not actually applied, oxy-Hb levels of the prefrontal cortex showed similar change when the pain stimulus was administered.

Abstract ID: 2334984

Surface Interface Optimisation of Elastomeric Impression Materials

David Joo

University of Queensland

Nominated IADR Scientific Category: Dental Materials 7: Polymer-based Materials - Physical Properties and Performance

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC08), Monday

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Keywords: Elastomers, Polymers, Siloxanes, Oxygen.

Objectives: To assess the effects of various surface parameters (moisture, temperature, contamination with haemostatic agents and the oxygen-inhibited layer [OIL]) on the detail reproduction of elastomeric impressions (PolyVinyl Siloxane [PVS] and Polyether [PE] on non-vital dentine *in vitro*).

Methods: Human molar teeth ($n=50$) were mounted in stone and coronal dentine exposed and flattened. Indents ($n=50$) were prepared using a Vicker's tester within dentine (20, 50, 100 μ m width). Surface treatments were performed prior to impression with PVS (ExpressTM, ImprintTM) and PE (Impregum SoftTM, RamitecTM). Detail reproduction was assessed by optical light microscopy (100x). Dentine/impression surface topography was scanned using a 3D laser scanner (D800, 3Shape A/S) for direct comparison with an untreated control.

Impressions ($n=96$) were taken with each elastomer on resin-based material samples (Filtek Z250, Adper Single Bond, Clearfil SE, Vitrebond, Ketac Glaze) imprinted with Vicker's indents (20, 50, 100 μ m width) and assessed using visual/tactile criteria for inhibition and optical light microscopy (64x). Inhibition timeframe was assessed by continuous setting for 10x manufacturers' setting times. OIL removal techniques were performed prior to impression taking (alcohol, pumice, air-blocking) and detail reproduction re-assessed.

Results: ISO standard 20 μ m detail (ISO 4823:2000) was reproduced in PVS/PE for control, heat-treated, moisture and haemostatic contaminated groups. 50 μ m was not reproduced in either PVS/PE for OIL group. Three-way factorial ANOVA showed statistical significance between resin-contamination and failure to reproduce ISO standard indents ($p < 0.0001$). Pearson's chi-squared analysis showed statistically significant polymerisation inhibition of PVS ($p < 0.0001$) and PE ($p < 0.05$) when exposed to OIL compared with controls. All impressions polymerised fully when allowed to set separately from OIL surface. Combining pumice treatment and glycerine air-blocking is the most reliable treatment for eliminating inhibition.

Conclusions: OIL inhibits polymerisation of both PVS and PE materials when in direct contact. PVS/PE inhibition creates an unacceptable loss of detail according to ISO protocol.

Abstract ID: 2328991

Salivary gland fat fraction estimated with a new MRI method

Yoshitaka Kise

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Nominated IADR Scientific Category: Diagnostic Sciences

Poster session: General (GP11), Tuesday

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Keywords: MRI, Fat fraction, Salivary glands, mDIXON Quant, MR spectroscopy.

Objectives: Measurement of fat fraction (FF) in the salivary glands is important in such diseases as Sjogren's syndrome, and it can be performed with MR spectroscopy. However, there is a limit in clinical application due to the complicated manipulations. A new magnetic resonance imaging (MRI) method, named mDIXON Quant, is convenient for clinical application. The aim of this study was to estimate FF in the salivary glands using two different methods, mDIXON Quant and MR spectroscopy, and then to investigate the clinical usefulness of mDIXON Quant in comparison with MR spectroscopy.

Methods: Sixteen healthy volunteers were enrolled in this study. They received two types of MRI examination, mDIXON Quant (6-point DIXON method) and MR spectroscopy (PRESS Single TE method), to measure FF in the parotid and submandibular glands. Ten subjects were also scanned by PRESS Multi TE method to determine the effect of T2 value. On mDIXON Quant images, the regions of interest were set

on both sides of the parotid and submandibular glands using the obtained FF map to determine FF.

Results: 1. High correlation was observed in FF measured by mDIXON Quant and PRESS (Single TE) (slope=1.07, $R^2=0.960$). 2. T2 value of the fat peak calculated by PRESS (Multi TE) was greater than T2 value of the water peak. 3. Even in taking the effect of T2 value by Multi TE method into account, a high correlation between mDIXON Quant and PRESS (Multi TE) was observed (slope=0.594, $R^2=0.964$).

Conclusions: The mDIXON Quant method appeared to be effective for FF measurement in the salivary glands because the values obtained by mDIXON Quant correlated well with those by MR spectroscopy.

Abstract ID: 2333198

The effects of the Y chromosome and intrauterine male hormones on human tooth size and shape

Felicity Lam

The University of Adelaide

Nominated IADR Scientific Category: Craniofacial Biology

Colgate Award entrant

Poster session: Junior (CJ05), Monday

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Keywords: tooth size, tooth shape, twins, Y chromosome, intrauterine hormones.

Objectives: Dental development is a Complex Adaptive System in which genetic, epigenetic and environmental factors interact during different stages to influence tooth size and shape. This study aimed to quantify the influences of the Y chromosome and intrauterine male hormones on the size and shape of permanent teeth, and provide further evidence for the Twin Testosterone Transfer Hypothesis.

Methods: An advanced 2D image analysis system was used to measure the mesiodistal, buccolingual, crown height and intercuspal dimensions from the vestibular and occlusal

views of each permanent tooth in 30 dizygotic opposite-sex female (OS) and 30 dizygotic same-sex female (SS) twin pairs. Tooth size and shape were analysed by calculating perimeters and surface areas, while customised macros defined the 25th, 50th, 75th percentiles along linear planes. MANOVA and Principal Components Analysis were used to quantify differences in tooth size and shape.

Results: There were trends of increased tooth size in the OS twins compared with their SS counterparts. Mesiodistal crown size was significantly greater in the OS cohort (7.1 ± 0.8 mm, mean \pm SD) than the SS cohort (6.9 ± 0.8 mm) for both upper and lower premolars ($p < 0.05$). Similarly, crown height and buccolingual crown size of incisors, premolars and molars were greater in the OS cohort compared with the SS cohort ($p < 0.05$). Furthermore, the perimeters and surface areas of all premolars and maxillary molars were significantly greater in the OS cohort than the SS cohorts ($p < 0.05$).

Conclusions: These findings support the Twin Testosterone Transfer hypothesis and provide insights into the influence of genetic, epigenetic and environmental factors on craniofacial development. Additionally, the information on tooth size and shape in twins may be useful in diagnosis and treatment planning in paediatric medicine.

Abstract ID: 2343753

Extracellular cysteines of *Candida albicans* Cdr1p affect its efflux-pump function

Joanne Lee

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Nominated IADR Scientific Category: Microbiology & Immunology

Colgate Award entrant

Poster session: Junior (CJ07), Monday

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Keywords: *Candida albicans*, Cdr1p.

Objectives: *Candida albicans* is the most common cause of nosocomial fungal infections which can be life-threatening in immunocompromised patients, especially infections caused by multidrug resistant isolates overexpressing the archetypal fungal multidrug efflux pump Cdr1p. Cdr1p belongs to the pleiotropic drug resistance (PDR) family of the ABC transporter superfamily. Its transmembrane domain contains four small and two large extracellular loops (ELs) and two small and two large intracellular loops connected by 12 membrane-spanning helices. Within the ELs, there are six highly conserved cysteines, yet we know little about their contribution to Cdr1p structure and function. The aim of this project was to determine the contribution of the six invariable cysteines of EL3 and EL6 to Cdr1p expression, folding and/or trafficking to the cell surface, and to Cdr1p pump function.

Methods: Six Cdr1p EL3 and EL6 serine mutants were created by PCR amplification of mutated CDR1 fragments using DNA primers designed to replace each cysteine with a serine codon. The CDR1 ORF fragments were used to transform fluconazole-sensitive *Saccharomyces cerevisiae* AD Δ . Correct integration at the genomic PDR5 locus of mutant constructs was confirmed by PCR amplification and DNA sequencing. AD Δ cells overexpressing the Cdr1p serine mutants were analysed for their fluconazole resistance and for proper folding and/or localization of Cdr1p to the cell surface by confocal microscopy of the C-terminally GFP-tagged Cdr1p variants.

Results: All six AD Δ /Cdr1p EL3 and EL6 mutants had 2- to 4-fold reduced fluconazole resistance. Cdr1p EL6 mutants had significant amounts of protein incorrectly localized inside the cell, whereas EL3 mutants appeared mostly affected in efflux pump function with correct localization of the protein to the cell surface.

Conclusions: EL3 cysteines are important for Cdr1p efflux pump function whereas EL6 cysteines appear to be more important for correct folding and/or trafficking of Cdr1p to the cell surface.

Abstract ID: 2343730

Crown Preparation Parameters Produced by New Zealand Dental Students

Tony Lin

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Nominated IADR Scientific Category: Prosthodontics
Research

Colgate Award entrant

Poster session: Junior (CJ06), Monday

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Keywords: Prosthodontics, Total occlusal convergence,
margin width, New Zealand dental student, tooth
preparation.

Objectives: Dental schools advocate metal-ceramic crown preparations to have 12° total occlusal convergence (TOC), 1.3-1.5 mm (metal-ceramic collar) and 0.5 mm (metal collar) margin widths. This is thought to directly influence restorations retention and resistance forms, and clinical survivability. The aim of this study is to present the TOC angles and margin widths of metal-ceramic molar preparations made by 4th and 5th year dental students at the University of Otago, New Zealand in 2014.

Methods: Forty-two digital files of student preparations for metal-ceramic molar restorations were collected for the year 2014. The files were uploaded onto a custom software (Preppr™) for measuring various tooth preparation geometries. It enables the measurement of buccolingual (BL) and mesiodistal (MD) cross-sections by objectively selecting 6 points to calculate TOC and margin widths using coordinate geometry. Distribution of values were analysed and presented as box and whisker plots.

Results: The TOC values for the BL aspects from quartile 0 to 4 respectively are as follows; -4.28°; 6.59°; 15.48°; 20.51°; 50.82°. For the MD aspects; -1.87°; 18.45°; 25.00°; 32.64°; 67.37°. The combined marginal widths in mm are as follows; 0.00; 0.50; 0.74; 1.02; 2.00.

Conclusions: Students are able to achieve TOC angles close to that recommended for the BL cross-section but not the MD cross-section. However, there was a large range from negative values (undercuts) to the extreme over preparations of > 60°. Majority of preparations meet the recommended marginal widths.

Abstract ID: 2341652

The potential of increased HIV education to change attitudes of JCU dental students towards patients with Human Immunodeficiency Virus (HIV)

James Liu

James Cook University

Nominated IADR Scientific Category: Oral Medicine &
Pathology

Colgate Award entrant

Poster session: Junior (CJ18), Monday

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Brisbane, Queensland, AUSTRALIA; Keywords: HIV,
Attitudes.

Objectives: The aim of this investigation was to evaluate the long term effects and short term effects of a brief educational intervention about the Human Immunodeficiency Virus (HIV) on the attitudes of James Cook University (JCU) dental students. This was achieved by evaluating the immediate and long term changes observed in their confidence and willingness to treat HIV patients (as well as other attitudes) after educational intervention was provided.

Methods: 62 students studying Bachelor of Dental Surgery (BDS) at JCU were selected in Years 1 to Year 2. The selected participants were given a self – administered questionnaire which consisted of an initial questionnaire to evaluate attitudes towards HIV, then an information sheet about HIV and its clinical implication. After the participants read the information sheet they were then re-evaluated on their attitudes towards HIV patients through a final questionnaire. A follow- up was conducted on 44 participants (71% of the

original sample) one year later to assess the long term changes in attitudes that were produced.

Results: Following HIV educational intervention, awareness of ethical responsibility remained at a reasonably constant, high level. However, significant positive changes were seen in areas of occupational concern, understanding of transmission risk, together with the confidence and willingness, to treat patients with HIV. These positive changes observed remained consistent when followed up one year later.

Conclusions: JCU dental students generally demonstrate a strong awareness of their ethical responsibility to treat HIV patients, however this may be suppressed by their concern for occupational exposure and transmission risk. Following brief intervention, through providing adequate knowledge about HIV and its clinical implication, positive changes in attitudes were observed in the short and long term.

Abstract ID: 2338520

Ultrastructure and properties of teeth treated using the Hall Technique

Carolina Loch

Faculty of Dentistry, University of Otago; Otago Museum

Nominated IADR Scientific Category: Cariology Research - Demin/Remineralization

Poster session: General (GP13), Tuesday

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Keywords: Dental caries, Scanning electron microscopy, Energy Dispersive X-Ray Spectroscopy, Nanoindentation.

Objectives: The Hall Technique (HT) is a non-invasive alternative for the management of caries in primary teeth. The technique is durable and patient-friendly, as it does not require anaesthetic injections, tooth preparation or caries removal. Clinical trials in New Zealand suggest that HT-treated teeth are 16 times more likely to experience success

(no retreatment, no abscess) than conventional restorations. This pilot study developed a protocol for characterising the ultrastructural, biomechanical and chemical properties of HT-treated carious teeth.

Methods: 12 HT-treated and 5 control carious non-HT-treated deciduous molar teeth were embedded in acrylic resin, thick-sectioned, radiographed, mounted and polished. Mechanical properties of carious and sound tissue were quantified using nanoindentation (n = 9). Specimens were then carbon-coated and examined under scanning electron microscopy (SEM). The chemical composition was quantified using energy-dispersive X-rays (EDS) (n=4).

Results: Elastic modulus (E) and hardness (H) values for sound enamel averaged 100.99 and 4.94 GPa, while dentine averaged 27.03 and 0.93 GPa respectively. Mean E and H values for carious lesions treated with HT were 7.52 and 0.32 GPa, while values for control specimens averaged 10.28 and 0.37 GPa. SEM images showed evidence of extensive demineralisation and hard-tissue loss in carious areas, with prominent dentine detachment under some lesions. Chemical analyses using EDS showed depletion in Ca and P content in carious areas in comparison to sound dentine (near 28 and 14%wt vs. 30 and 15%wt). Chemical maps showed evidence of major and minor element distribution within the lesions and sound areas.

Conclusions: This protocol adopted promising techniques for characterisation of the outcomes of the Hall Technique. Further laboratory-based work using larger sample sizes in an *in vitro* model will provide ultrastructural data on the nature of the structures and processes involved to determine the success or otherwise of the HT in preventing caries progression.

Abstract ID: 2312785

Recording of motor units during experimental muscle pain in masseter

Bushra Malik

University of Sydney

Nominated IADR Scientific Category: Network for Practice - based Research

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC09), Monday

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Keywords: Motor unit, Force, Masseter.

Objectives: Background and aims: We examined whether the effect of masseter muscle pain on motor unit recruitment pattern is the same at different locations in the right masseter muscle during standardized jaw tasks.

Methods: Methods: The University of Sydney Ethics Committee approved the study. Two bipolar fine-wire electrodes were placed at 2 locations (anterior and posterior) within the right masseter muscle of 4 pain-free participants to record single motor unit (SMU) activity. Participants performed 3-5 trials of standardized biting onto a force transducer during baseline recordings, during experimental pain elicited in the right masseter with infusion of 5% hypertonic saline (pain), and during isotonic saline infusion (control).

Results: Results: Mean visual analogue scale scores during pain or control were: 34 mm and 2mm, respectively. 10 SMUs were discriminated. At baseline, in 3 participants, SMUs were recorded at the posterior site only whereas in 1 participant, SMUs were at the anterior site only. 6 SMUs were present in all three conditions i.e. baseline, pain and control trials. In 1 participant, 2 SMUs at the anterior site were present in baseline and control trials but were not identified in pain trials. At the same time in this same participant, 2 new SMUs appeared at the posterior site during pain trials.

Conclusions: Conclusion: The data suggest that, during experimental pain, the pattern of recruitment of SMUs is not always the same at 2 different sites in the masseter. We suggest that, rather than only excitation or inhibition, there is reorganization of activity in painful muscle.

Abstract ID: 2315586

Probiotics alter dectin-1 expression and cytokine profile in macrophages challenged with *Candida*

Victor Matsubara

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Nominated IADR Scientific Category: Microbiology & Immunology

Colgate Award entrant

Poster session: Senior, Basic Research (CSB10), Monday

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Keywords: Probiotics, macrophages, *Candida albicans*, Lactobacillus.

Objectives: Probiotics are live microorganisms that, when administered in adequate quantities, confer health benefits to the host. The infection rates of *Candida albicans*, an opportunistic fungus that causes candidiasis in different parts of human body, may be reduced by probiotics. However, the mechanisms involved in the interactions between *C. albicans* and these bacteria are largely unknown. The aim of this study was to test the hypothesis that probiotics may impair signaling induced by *C. albicans* in human macrophages.

Methods: The human THP-1 monocyte lineage was challenged with *C. albicans* and/or lipopolysaccharide (LPS) of *Escherichia coli* and added with a probiotic strain (*Lactobacillus rhamnosus* LR32, *Lactobacillus casei* L324m and *Lactobacillus acidophilus* NCFM) in a co-culture assay. After 12 hours, cytokines profiles of macrophage supernatant were determined by ELISA. The expression of the receptor Dectin-1 on macrophages was determined by

Real-time quantitative Polymerase Chain Reaction (RT-qPCR).

Results: The addition of probiotic strains altered the cytokine profile of macrophages activated with *C. albicans* and LPS, when compared to control, leading to increased levels of IL-10 and reduced levels of IL-12 ($p < 0.05$). RT-qPCR data demonstrated that probiotics reduce the relative expression of *Clec7a* encoding Dectin-1 receptor ($p < 0.05$), which recognizes *Candida albicans* in the yeast form.

Conclusions: Our data suggest that probiotic lactobacilli reduce inflammation by impairing the recognition of *Candida albicans* by macrophages and altering the production of proinflammatory cytokines. Thus, since inflammation favors yeast-to-filament transition and the filamentous form is required for pathogenicity, probiotics may break the vicious cycle involving inflammation, yeast-to-hyphae transition and development of candidiasis.

Abstract ID: 2340497

DNA methylation status of VEGF-A, HIF-1 α and BMP-2 in gingival tissue of smokers.

Trudy Milne

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Nominated IADR Scientific Category: Periodontal Research - Pathogenesis

Poster session: **General (GP14), Tuesday**

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Keywords: Methylation, gingival, smoker.

Objectives: To determine the DNA methylation status of the three genes, VEGF-A, HIF-1 α , and BMP-2 in the gingival tissue of smokers and non-smokers and to correlate this with the levels of mRNA and protein expression.

Clinically smokers have decreased bleeding on probing and low levels of inflammation but at the same time they have greater alveolar bone loss and less favourable responses

following surgical, non-surgical and regenerative periodontal treatments compared with non-smokers. Smoking has been implicated as an environmental stress which can induce changes in the methylation status of DNA resulting in changes in transcriptional activity.

Methods: Gingival tissue was collected from smokers ($n=10$) and non-smokers ($n=10$). Each sample was divided in half and placed in AllProtect tissue agent for DNA and RNA isolation and 10% formalin for immunohistochemistry. Purified DNA was then incubated with a DNA methylation-sensitive restriction enzyme or a methylation-dependent restriction enzyme. The resultant DNA fragments were used in a gene-specific EpiTect qPCR assay, which allowed for the quantitation of hyper-/hypo- methylation sites in selected regions of the promoter for each of the genes. Duplex Taqman qPCR assays were used to determine the relative levels of mRNA for VEGF-A, HIF-1 α and BMP-2. Formalin-fixed paraffin-embedded gingival tissue sections were subjected to an indirect method of antigen detection for VEGF-A.

Results: Methylated DNA was not detected in the VEGF-A, HIF-1 α or BMP-2 genes for either group, smoker or non-smoker. Similar levels of VEGF-A, HIF-1 α , and BMP-2 mRNA were detected in both groups. However, immunohistochemistry showed VEGF-A to be associated with smokers.

Conclusions: There is no difference between smokers and non-smokers in terms of the methylation of VEGF-A, HIF-1 α , and BMP-2 genes in their gingival tissues. Future work will investigate the methylation status of osteogenic and angiogenic genes

Abstract ID: 2315463

Eyesight: a study of dental students during their clinical training

Colleen Murray

University of Otago

Nominated IADR Scientific Category: Education Research

Poster session: **General (GP15), Tuesday**

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Keywords: dental education, eyesight examination, vision, clinical dentistry, dental students.

Objectives: The aims were to investigate New Zealand dental students' known eyesight status, factors influencing them to attend eyesight examinations, methods of correction, perceptions of recall periodicity, and compliance with optometrist's recommendations.

Methods: Ethical approval was obtained and a questionnaire-based survey was conducted of all 319 undergraduate students involved in patient care. Data were screened, checked and analyzed in Stata 13.1. The chi-square test was used to test for significance of observed associations with an alpha level of 0.05.

Results: The participation rate was 89.3%. Of the 84.9% who had been tested at some stage, 65.1% had their eye examination due to sight deterioration and 70.2% needed correction. Spectacle use (68.2%) was more common than contact lens use (38.7%). An interest in laser surgery was expressed by 69.3%. Myopia was common (88.4%) and 2.2% believed themselves to be colour blind. Of those with corrected vision, 63.6% followed their optometrist's recall advice. Some 31.8% of respondents were unsure if their eyesight was satisfactory to practice dentistry. Magnification loupes were used by 22.6% with no significant gender difference ($p = 0.0967$) and an increase in use as they progressed through the course ($p < 0.001$).

Conclusions: Many clinical dental students had never had an eyesight examination and were unsure of their vision. The number who considered their eyesight satisfactory increased in the final year group, which may be influenced by their greater use of magnification. Compliance with recall recommendations was unsatisfactory. Mandatory screening prior to commencing clinical practice may be valuable.

Abstract ID: 2343976

Quality of life changes in pre-school children who underwent treatment for traumatic dental injuries under general anaesthesia.

Chaturi Neboda

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC10), Monday

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Keywords: Quality of life, ECOHIS, general anaesthesia, children, dental trauma.

Objectives: This study sought to (i) assess the changes in the oral health related quality of life of pre-school children who presented to the emergency department for traumatic dental injuries (TDIs) and were subsequently treated (extractions) under GA, and (ii) evaluate the appropriateness of using the Early Childhood Oral-Health Impact Scale (ECOHIS) questionnaire to measure the prevalence of impacts from TDIs among pre-school children.

Methods: A total of 87 pre-school children, with a mean age of 2.7 years, who underwent emergency dental treatment under GA for TDIs, were recruited over a period of 12 months. The ECOHIS questionnaire was completed by the same parent or caregiver both at the time of presentation to the emergency department and at the 2-week post-treatment visit. Data were analyzed using repeated ANOVA with adjustments for multiple comparisons using the Bonferroni tests with the significance level set at 5%.

Results: 92% of the TDIs were classified as being complicated of which 70.5% were luxation injuries. 43 participants, 58.1% males and 41.9% females with a mean age of 2.7 (SD = 1.38),

completed the two-week post- treatment questionnaires. The overall ECOHIS ($p=0.64$) and the subscales [child impact scale (CIS); $p=0.59$, and family impact scale (FIS); $p=0.81$] scores for TDIs decreased after dental treatment under GA but were not statistically significant. The greatest decreases in the ECHOIS scores were for the domains of child functions in the CIS and for the domain of parental distress in the FIS.

Conclusions: (i) The OHRQoL of pre-school children who presented to the emergency department for TDIs and were subsequently treated (extractions) under GA remained unchanged, and (ii) the ECOHIS questionnaire should be amended to better reflect the impacts from TDIs among pre-school children.

Abstract ID: 2327261

Percutaneous-exposure-incidents At A Dental Faculty: A Review Of Practice

Muhammad Niazi

University of Otago

Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

Colgate Award entrant

Poster session: Junior (CJ08), Monday

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Keywords: Needle-Stick Injuries, Needlesticks.

Objectives: To study the prevalence and risk factors of sharps and needlestick injuries (NSIs) sustained by the staff and undergraduate dental students at the Faculty of Dentistry, University of Otago

Methods: A cross-sectional survey among students (fourth & fifth year BDS students, postgraduate students), staff (academic/clinical) and dental assistants was performed using a self-administered questionnaire to collect information pertaining to needle-stick and sharps injuries during February 2012 - November 2013. Data were

tabulated in MS Excel® and analysed using SPSS statistical software®

Results: A total of 234 participants completed the questionnaire. Seventy participants (29.9%) reported percutaneous injury. Most exposures occurred among undergraduate dental students (70%), followed by postgraduate students, academic staff (18.6%) and dental assistants (11.4%). Prevalence of under-reporting was noted around 32.8%. Needle-stick was the most frequent (34.8%) while injury from surgical bur and scaler tips were reported at 25 (28.1%) and 19 (21.3%) respectively. Only three participants (4.28%) took the post-exposure prophylaxis after an incident. Conclusions: Percutaneous exposure incidents continue to occur in healthcare settings in spite of emphasis on improved work practices and use of safety devices. Improvements are required in the use of safe-practice and in developing a culture on more comprehensive reporting and adopting post-exposure prophylaxis when required. Students new to the clinical environment need structured training and education before starting their clinical work to minimize accidental needlestick and sharps injuries. Teaching staff must set an example by adopting universal precautions with every patient, and students must be advised to report all injuries so that appropriate measures can be started.

Abstract ID: 2358573

Practice, Availability and Knowledge of Oral Hygiene Aides amongst the Health Care Professionals of St Giles Hospital, Fiji

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

Poster session: General (GP16), Tuesday

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Keywords: Knowledge, Oral Hygiene Aides, mental asylum

Objectives: WHO defines intellectual disability as significantly reduced ability to understand new or complex information

and to learn and apply new skills. This results in a reduced ability to cope independently. No formal research has been conducted in Fiji to ascertain the knowledge of caregivers on oral hygiene aides, their practice and availability of oral hygiene aides.

Methods: This was a questionnaire based cross sectional descriptive study. A convenience sampling was done and 30 health care professionals at the local mental asylum, St Giles Hospital took part in this study. The questionnaire was used to ascertain whether the health care providers were aware of the oral hygiene aides used and if they were able to adequately maintain oral hygiene of their patients.

Results: 100% of the participant had background knowledge on oral hygiene aides. However, only 47% actually practiced oral hygiene for the patients, whereas the rest (53%) did not think it was their role or had work overload. 100% of the participants said that toothpaste and toothbrush were readily available for the patients. There was lack of preventive dental services to the institution.

Conclusions: In St.Giles Hospital, Fiji all the health care professionals interviewed had sound knowledge on the oral hygiene aides. However, about half practiced what they knew whereas others did not see it as their role or did not have time to for it. The fact that there was lack of availability of the dental services to this institution, may have contributed to the health care professionals' attitude towards oral hygiene maintenance to their patients.

Abstract ID: 2331157

Understanding responses to Likert options used in P-CPQ-16 and FIS-8

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

Poster session: General (GP17), Tuesday

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Keywords: Likert response options, Respondent Impression and interpretation, P-CPQ-16 and FIS-8.

Objectives: Likert response format is the most frequently used method in quality of life studies because it is easy to complete and makes easy score computation possible for the investigator. However, the meaning of words in the response options may remain somewhat unclear to respondents. For example, how often is 'often' and how sometimes is 'sometimes'? And are they different or similar? Inexact or ill-defined words might confuse respondents and validity of collected data could be affected. The aim of the study was to explore respondents' impressions and interpretations of the words used in the response options of the Parental-Caregivers Perceptions Questionnaire (P- CPQ-16) and Family impact (FIS-8) scales.

Methods: The study adopted a qualitative approach, with semi-structured and open-ended interviews. Fifty respondents from Malaysia and New Zealand were interviewed. They were the parents of pre-schoolers undergoing dental treatment. Prior to the interview, they were invited to answer the short-form P-CPQ-16 and FIS-8 questionnaire. Selected respondents were then identified to undergo a 30-minute in-depth interview. The transcriptions produced were analysed using the inductive-deductive content-analysis method, both manually and computer-assisted using NVivo 10.

Results: Most respondents reported that the given response options were different and distinguishable. However, some were "close" to each other but in different places. Some struggled and admitted it was difficult to determine the meaning of particular words. Respondents reported their interpretation of the response options "Sometimes" and "Often" based on various frames of reference, including time-frame, occasion and condition.

Conclusions: Respondents' impressions and interpretations of Likert response options used in P-CPQ-16 and FIS-8 differed, with different frames of reference used. Researchers and clinicians using these scales need to view scale scores cautiously, because minor variations may be due to differences in respondents' interpretation of response options. This further underlies the necessity to know and use of minimally important differences (MID).

Abstract ID: 2343998

Oral Health Promotion In Lithgow Aged Care Facilities

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Nominated IADR Scientific Category: Oral Health Research

Colgate Award entrant

Poster session: Junior (CJ09), Monday

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Keywords: Dental care, Ageing population, Oral hygiene, Oral health.

Objectives: Australia's population is aging and there is a high prevalence of residents living in aged care facilities who experience oral disease and conditions. Therefore, there is a need to target oral health within this demographic. The aim of this program was to improve the understanding of dental practices and oral hygiene in independent residents and staff members in the aged care facilities of Lithgow.

Methods: A needs analysis was conducted through a literature search, staff interviews, meeting with local professionals and observations of the nursing homes. The program was conducted at Tanderra Nursing Home, Three Tree Lodge and Tabulam Cottage. It consisted of conducting a focus group and presentation for staff members, delivering oral hygiene instructions to independent residents individually, making labelled brushing kits for dependent residents and making a dental resources folder for the management. Surveys were handed out before and after the presentation.

Results: In total, 20 staff members from 3 aged care facilities attended the presentations. The post- presentation surveys indicated that the nurses had an increase in confidence and understanding towards addressing the resident's brushing, selecting the correct toothpaste, cleaning dentures, recognising oral conditions, benefits of fluoride and managing dry mouth. Challenges faced in the facilities included obtaining access to the dental treatment required

by the residents, oral care lacking in priority and lack of training for the staff members.

Conclusions: Regular oral health promotion and education in aged care facilities should be conducted and clear referral pathways to dental care should be established.

Abstract ID: 2331104

Effects of Azithromycin on Red Complex Polymicrobial Biofilms

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Nominated IADR Scientific Category: Periodontal Research - Therapy

Colgate Award entrant

Poster session: Senior, Basic Research (CSB11), Monday

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Keywords: Azithromycin, Red complex bacteria.

Objectives: To evaluate the effect of azithromycin (AZ) on mono- and polymicrobial biofilms comprised of *Porphyromonas gingivalis* (Pg), *Treponema denticola* (Td) and *Tannerella forsythia* (Tf) in comparison to amoxicillin+metronidazole (AM) in a polymicrobial biofilm model.

Methods: Pg W50, Td ATCC 35405 and Tf ATCC 43037 were grown in Oral Bacteria Growth Medium (OBGM) supplemented with N-acetyl muramic acid under anaerobic conditions at 37°C. Planktonic growth of bacterial cultures was monitored by measuring absorbance at 650 nm. Different Pg, Td and Tf combinations were aliquoted into 96-well flat-bottom plates with addition of AZ and AM at different concentrations prior to incubation at 37°C anaerobically for 48 h. After the processes of rinsing and drying, the adherent biofilms were stained with crystal violet, dissolved in ethanol+acetone followed by absorbance measurement.

Results: In this model, there was microbial synergism for biofilm formation between Pg and Td, Pg and Tf and Td and Tf. The combination of PgTdTf enhanced biofilm formation significantly. AZ was less effective compared with AM for the inhibition of mono- and polymicrobial biofilms. AM effectively reduced PgTdTf polybiofilm formation in a dose response manner up to 5 mg/mL within the time frame of the experiment, whereas AZ decreased biofilm biomass by only 62% at this concentration. AZ's effective concentration was higher than achievable in clinical practice. AM's effective concentration was marginally within the clinically achievable concentration.

Conclusions: Synergistic biofilm formation is demonstrated by a polymicrobial consortium consisting of Pg, Td and Tf compared with monomicrobial inoculation with any of the individual bacteria. Antibiotics do not abolish biofilm formation at concentrations up to 5 mg/mL therefore could be recommended only as an adjunct to mechanical removal in treating periodontal diseases.

Abstract ID: 2329805

The effect of Smokefree Smiles training on oral health workers

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

Colgate Award entrant

Poster session: Junior (CJ10), Monday

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Keywords: smoking cessation, oral health, Quit.

Objectives: Brief smoking cessation advice provided by health professionals can significantly increase smokers' chances to successfully quit smoking. The Smokefree Smiles project was developed by Quit Victoria and aims to increase

engagement and capacity of oral health professionals and support staff to provide brief smoking cessation support to clients. The project includes testing a new intervention framework designed specifically for the oral health setting: Ask, Advise and Help. The aim of the present study was to compare knowledge and confidence levels of oral health workers in delivering smoking cessation advice to clients, before and after Smokefree Smiles training.

Methods: 98 oral health workers from five Victorian public and private dental sites were invited by Quit Victoria to participate in a face-to-face training session concerning smoking cessation counselling. The participants were administered pre and post-training surveys using both Likert scale questions and open-ended questions. The surveys investigated the improvement in self-perceived knowledge, attitudes and confidence levels. The data was analysed and compared using Wilcoxon Signed Ranks Tests, one-way ANOVA testing and paired samples T-tests.

Results: The training elicited an improvement in knowledge of smoking cessation interventions for the oral health professional's role ($p < 0.001$). There were also significant improvements in attitudes of the role of the oral health staff in providing help around smoking cessation ($p < 0.001$). All questions relating to participants' confidence levels regarding smoking cessation counselling showed an improvement ($p < 0.01$) with the highest improvement seen in oral health therapists ($p < 0.001$).

Conclusions: This study demonstrates that Smokefree Smiles improved the knowledge and confidence of oral health workers to provide brief smoking cessation interventions. This community-level intervention, with further development, may have a significant effect throughout Victorian dental clinics/hospitals. The next stage of this research is to assess the impact of this program on referral rates to the specialised quitting telephone counselling service, Quitline.

Abstract ID: 2332599

Finding support online: peer support in head and neck cancer

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC11), Monday

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Keywords: Head and neck neoplasms, social support, qualitative research.

Objectives: Head and neck cancer results in disruption to physical and emotional wellbeing of both patients and caregivers. Peer support networks are useful in supporting psychological adjustment and improving coping for people who experience cancer. This study aims to describe the social support sought and received in public online forums dedicated to head and neck cancer.

Methods: This study adopted a qualitative descriptive methodology grounded in the ethnographic principles of observation and naturalistic data collection and analysis. Two popular public head and neck cancer forums were identified through an internet search. Threads and replies within a specific timeframe were collected and downloaded from both forums. The data were coded using a framework derived from theories of social support with emergent themes specific to head and neck cancer further analysed.

Results: 307 new threads and 4300 replies were collected and analysed from two forums. Both patients and caregivers sought and shared support through the forum. A strong sense of trust and familiarity among users were central to forum interactions. Advice from fellow users was highly

valued and it highlights the 'human side' of confronting information about treatment and survival prognoses. Forums provided a strong source of emotional support, were used as a place to 'vent' or discuss aspects of cancer diagnosis or treatment unable to be shared with loved ones. Forums also provided a platform to share personal disease narratives through reflective posts and images.

Conclusions: Internet based peer support appears to be highly relevant to people who experience head and neck cancer in managing distressing aspects of the disease and recovery. Our findings support the high relevance of online support in the Australian context to overcome issues of social isolation, stigma and geographical distance.

Abstract ID: 2350675

Perceived dental needs and normative dental needs of hearing impaired adults in San Isidro Disability Center, West Guadalcanal, Honiara, Solomon Islands

Geraldine Pellie

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

Colgate Award entrant

Poster session: Junior (CJ16), Monday

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Keywords: dental needs, Hearing impairment, disability.

Objectives: 1. To determine the perceived dental needs of hearing impaired adults in San Isidro Disability Center. 2. To determine the normative treatment needs of the hearing impaired adults in San Isidro Disability Center.

Methods: This was a cross-sectional study conducted in San Isidro Disability Centre, located in west Guadalcanal, Honiara, Solomon Islands; targeting the hearing impaired-institutionalized adults from 18-40 years of age. There were 51 hearing impaired adults enrolled in San Isidro Disability Center. Everyone was invited to participate but only those

who consented were included as participants of the survey. This research was based on observations and questionnaire based interviews on what oral health problem each participant 'thought' they had. Oral examinations were done after the completion of questionnaires to obtain the actual dental problems and treatment needs of each participant.

Results: 76% believed they have healthy mouth basing their perception on the absence of pain; 20% were unsure; only 4 % believed to have unhealthy mouth. In addition, 57% think they do not need dental treatment(s); 39% believed they do need dental treatments and 4% were unsure. Oral examinations revealed 56.7% have decay; 23.3% have missing teeth; 96.9% have no dental filling(s). 61.5% have advanced periodontitis while 38.5% have mild to moderate periodontitis. Only 4 participants out of the total population (30) scored zero (0) for pocketing. However, all participants were positive to bleeding on probing.

Conclusions: Majority of the participants believed that they do not have dental problems neither do they need dental care, however, more than half of the participants have decay; gum problem and periodontitis thus oral hygiene awareness and dental care is an urgent need for this population.

Abstract ID: 2338666

Periodontal Disease and Women's health: Awareness and Attitudes of Clinicians

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Nominated IADR Scientific Category: Periodontal Research - Therapy

Colgate Award entrant

Poster session: Junior (CJ11), Monday

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Keywords: periodontitis, pregnancy, sex hormones, dentists, physicians.

Objectives: Changes in female sex hormones during phases of the reproductive life affect oral and periodontal health, while periodontal health itself may affect reproductive health. It is therefore essential that dentists and obstetricians- gynaecologists (OB/GYNs) are aware of these interactions as early intervention and prevention result in better management of these patients.

Aim: To evaluate the knowledge and practice attitudes of clinicians regarding periodontal disease (PD), reproductive endocrinology and their interactions.

Methods: Questionnaires were mailed to 1000 dentists and 306 OB/GYNs in Victoria. Minitab® v17 statistics software was used to correlate the knowledge and practice behaviours with different parameters evaluated.

Results: The overall response rate was 39% (Dentists: n=371; OB/GYNs: n=123). Most dentists (77.87%) learnt about the link between oral health and systemic health as part of their dental education, however only 31.30% learnt about women's reproductive health specifically. 24.37% of OB/GYNs learnt about the link between oral health and systemic health and 18.33% specifically about women's reproductive health. Dentists read oral health literature at least weekly (54.79%), while OB/GYNs never/annually read literature relevant to oral health (94.83%). Clinicians source their literature from a combination of sources including the internet (60.58%), professional magazines (87.14%), and peer reviewed journals (58.30%).

Both groups of clinicians remain unaware of the links between periodontal disease, menstruation, fertility and the use of ovulation inducing drugs whilst most were aware of the bidirectional relationship of periodontal disease with pregnancy. In practice, only 63.51% of dentists provide alternative treatment options for pregnant patients and 51.72% of OB/GYNs rarely/never refer their patients to dentists.

Conclusions: There is a discrepancy between literature and the knowledge of clinicians regarding the association between PD and women's health, which is further manifested in their clinical behavior. More education is

required at various stages of clinician's professional career to update clinicians regarding contemporary literature.

Abstract ID: 2342672

The Effect Of Concentrated Growth Factor On Nerve Regeneration

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Nominated IADR Scientific Category: Implantology Research

Colgate Award entrant

Poster session: Senior, Basic Research (CSB12), Monday

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Keywords: Nerve regeneration, Dental Implants.

Objectives: The aim of this study is to evaluate the effect of a Concentrated Growth Factor (CGF) on proliferation, secretion and migration of Schwann cells (SCs) during peripheral nerve regeneration around dental implants. Methods: CGF is a newly generated complex that contains fibrin matrix and plasmatic growth factors. Briefly, rat venous blood was centrifuged to collect the plasma that was let set to form a matrix. The soluble component of the matrix was used to produce conditioned media to treat SC cell line in culture. A CCK-8 kit assay was used to investigate the effect of CGF on SCs proliferation. PCR and Westernblot were applied to detect secretion of nerve growth factor (NGF) and glial derived neurotrophic factor (GDNF) after CGF treatment. A Scratch assay was employed to analyze the effect of CGF on SCs migration. In order to unveil whether the augmentation of migration was mediated by integrin β 1, integrin β 1 was detected by Westernblot after CGF treatment. Then integrin β 1 was silenced by siRNA, the blocking of integrin β 1 was determined and Transwell migration assays were used to investigate the changes with cell migration after integrin β 1 silencing.

Results: The Optical Density (indicative of cell number) of CGF treated groups were significantly higher than those of control groups, indicating proliferative effect of CGF in SCs. CGF also increased expression of NGF and GDNF in SCs. The migration rate of CGF group was higher than the control group, and integrin β 1 expression was increased by CGF, indicating integrin β 1 were involved in CGF induced migration. After integrin β 1 silencing, CGF still promoted SCs proliferation, suggesting integrin β 1 was not necessary in CGF induced migration.

Conclusions: CGF promoted SCs proliferation, secretion and migration, partially via an integrin β 1 mediated pathway. This finding implies that CGF may have potential to enhance peripheral nerve regeneration, therefore improve the osseoperception of dental implants.

Abstract ID: 2334712

Human bone segmentation methods comparison using MicroCT images

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Nominated IADR Scientific Category: Mineralized Tissue

Poster session: General (GP19), Tuesday

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Keywords: x-ray microtomography, threshold limit values.

Objectives: The purpose of this study was to compare two different methods of microtomography (μ CT) images segmentation, visual and automatic, in order to evaluate the influence of visual segmentation on the results of the

morphometric analysis of human bone, using automatic segmentation as standard.

Methods: Six months after the bone graft insertion in the jaw, 16 samples containing the fixing screw covered with 0.5 to 1mm human bone were obtained and scanned using SkyScan1173 scanner (Bruker, Kontich, Belgium). Three evaluators segmented the μ CT images manually and threshold values were noted. Automatic segmentation was done using the CTAn software (Bruker, Kontich, Belgium) and 3D analysis was performed using the values determined visually and automatically. Five bone morphometry assessment parameters were analyzed (BV / TV, Tb.Th, Tb.N, Tb.Sp, Conn.Den) and used to compare the results of two different methods of segmentation.

Results: In the analysis of variance (ANOVA), there was no statistically significant difference comparing the parameters of bone volume/tissue volume ($p = 0.042$), trabecular thickness ($p = 0.183$), number of trabeculae ($p = 0.0672$), spacing between the trabeculae ($p = 0.973$) and trabecular connectivity ($p = 0.204$). It was observed ICC values 0.55-1 and 0.546-0.991 for intra and inter- correlation, respectively.

Conclusions: The main advantage of automatic segmentation is that it is fully performed by computer, without human interaction, thus the method is an objective method and should be considered as the first choice for human bone segmentation.

Abstract ID: 2335386

Antimicrobial effect of medical-grade manuka honey against oral bacteria *in vitro*

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Nominated IADR Scientific Category: Periodontal Research -
Therapy

Colgate Award entrant

Poster session: Senior, Basic Research (CSB13), Monday

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Keywords: antimicrobial, antibacterial, manuka honey,
periodontal pathogens.

Objectives: To assess the antimicrobial effect of manuka
honey (*Leptospermum scoparium*) against oral
microorganisms in order to explore its potential use in
periodontal treatment.

Methods: Manuka (Comvita®, New Zealand) and white
clover (*Trifolium repens*) honey (Hollands®, New Zealand),
which served as a control honey, were compared for their
minimum inhibitory concentration (MIC) and minimum
bactericidal concentration (MBC) against four representative
oral bacterial species. Honey was added to brain heart
infusion (BHI), inoculated with the test microorganisms and
incubated anaerobically at 37°C for 18 hours. MIC was
determined by measuring optical density and MBC by spot-
plating samples on BHI agar and incubating anaerobically.
Results: Both manuka and clover honeys inhibited growth of
Streptococcus sanguinis and *S. gordonii* at 12.5% (w/v) and
killed the bacteria at 25% (w/v) after 18 hours of incubation.
S. mutans was resistant to both honeys at 50% (w/v), the
highest concentration tested. *Fusobacterium nucleatum*
(four strains) was killed after 4 hours incubation at 25% and
6% (w/v) for manuka and clover honeys, respectively.

Conclusions: Manuka honey was more effective than clover
honey against three of the tested plaque-associated species.
Subgingival application of manuka honey as an adjunct to
periodontal treatment merits further investigation.
However, since *S. mutans* was relatively resistant and pH of
honey is below 5.5 this may predispose root surfaces to
caries and erosion.

Abstract ID: 2343898

A comparison of anesthetic efficacy of combined local anesthetic and ketamine in patients with irreversible pulpitis in the posterior mandibular teeth: a clinical trial.

Vahid Sakhaei Manesh

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Nominated IADR Scientific Category: Dental Anesthesiology Research

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC12), Monday

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Keywords: Local anesthesia, Inferior alveolar nerve block, Irreversible pulpitis, Ketamine, Articaine.

Objectives: The aim of the current randomized, double blind, clinical study was to evaluate the effect of adding ketamine (a potential analgesic in sub-anesthetic doses) to dental local anesthetics, on the success rate of the inferior alveolar nerve block in posterior mandibular teeth experiencing irreversible pulpitis.

Methods: Forty two patients were randomly allocated to two groups after diagnosis of irreversible pulpitis. Group 1 patients received two cartridges containing 3 ml of 4% articaine with epinephrine 1:200,000 and 0.4 ml of ketamine (20 mg) while group 2 patients received 3 mg of 4% articaine with epinephrine 1:200,000 and 0.4 ml of normal saline in a double blind manner. Anesthetic success was clinically evaluated after 15 min. Data was entered into SPSS and analyzed using Chi-square tests and independent samples t tests with a significance rate of 0.05.

Results: The success rates for group 1 and 2 were 55% and 42.9%, respectively ($p = 0.437$). A negative response to electric pulp testing was recorded in 80% of group 1 and

52.4% of group 2 patients ($p=0.062$). There was no significant difference in the stage at which patients felt pain ($p > 0.05$).

Conclusions: Within the limitations of this study, adding 20 mg of ketamine to local anesthetics does not seem to have a significant effect on the anesthetic success of posterior mandibular teeth with irreversible pulpitis. Considering the potential analgesic effects of ketamine, further research regarding different prescription and evaluation times of anesthesia is suggested.

Abstract ID: 2335963

Time-dependent changes in prefrontal cortex activity during tooth clenching

Shigemitsu Sakuma

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Nominated IADR Scientific Category: Neuroscience

Poster session: General (GP20), Tuesday

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Keywords: functional near-infrared spectroscopy, prefrontal cortex, clenching.

Objectives: Mastication increases blood flow to the prefrontal cortex (PFC), which is involved in higher brain functions such as learning and memory. Thus, it has been suggested that PFC activation following oral functional movements may be effective in improving motor function and preventing dementia. Functional near-infrared spectroscopy (fNIRS) studies have measured brain activity associated with tooth clenching in the motor cortex. However, the hemodynamics in the PFC during tooth clenching remain unknown. In the present study, we examined the active region and time course of activity in the PFC during moderate intensity clenching using fNIRS.

Methods: Sixteen healthy subjects (11 males, 5 females, mean age 27.8±4.4 years) performed tooth clenching at moderate intensity. We measured PFC activity-associated changes in oxygenated hemoglobin (oxy-Hb) using a multichannel fNIRS measurement system with a measurement probe (22 channels). The measurement time schedule was as follows: after an initial 5 min of rest, subjects performed tooth clench for 1 min. To determine the average value of oxy-Hb, responses were divided into four 20-s intervals; 20 s of rest just before clenching and then 1 min of clenching divided into three 20-s intervals. ANOVA and post hoc tests were used to identify differences in oxy-Hb changes associated with tooth clenching ($p < 0.05$ for each channel).

Results: The oxy-Hb values in the whole PFC from clenching start (0 s) to 20 s were 0.010 ± 0.034 mM•mm, from 20 to 40 s were 0.031 ± 0.034 mM•mm, and from 40 to 60 s were 0.060 ± 0.033 mM•mm. For individual channels, 17 of the 22 channels showed a significant increase in oxy-Hb during clenching.

Conclusions: In healthy volunteers, activity in the dorsolateral prefrontal cortex related to learning and planning increases over time when performing tooth clenching.

Abstract ID: 2343683

Bone healing stimulated by low-intensity pulsed ultrasound (LIPUS) in critical-sized bone defects in rats

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Nominated IADR Scientific Category: Cariology Research - Demin/Remineralization

Colgate Award entrant

Poster session: Junior (CJ12), Monday

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Keywords: Bone, Regeneration, LIPUS, calvaria, osteogenesis.

Objectives: The potential for clinicians to accelerate bone healing through low-intensity pulsed ultrasound (LIPUS) has a wide range of opportunities in the medical health field and has been shown to accelerate osteogenesis at the molecular, cellular and clinical level. However, further studies, including the effects of the ultrasound setting, treatment times, and overall effects in an appropriate animal model are still required for optimizing clinical use. Given the osteogenic properties stimulated by LIPUS, we tested the hypothesis that minimal, daily LIPUS treatment can promote bone regeneration in critical-size defects in an animal model.

Methods: Full-thickness calvarial defects with 7 and 5-mm sizes were produced bilaterally in the parietal bones of 12 female Sprague-Dawley rats. The rats were equally divided into a control or LIPUS treatment group. Daily LIPUS was applied to the calvaria of treatment rats for 5 minutes for 8 weeks. Rats were sacrificed at 8 weeks post-operatively and their calvarium removed for bone-healing analysis by histology and micro-CT.

Results: Tissues surrounding the calvarium healed over the defects and there were no animal deaths or evidence of distress throughout the study. Calvarial bone defects did not heal in either control or LIPUS rats after the 8-week period and no significant difference in healing between the control and LIPUS group was noted by the micro-CT and histology.

Conclusions: Daily, short-duration, LIPUS did not enhance bone healing of critical-sized rat calvarial defects as examined radiographically and histologically. Our current results, in conjunction with previous research, suggest that longer treatment times may be needed to accelerate osteogenesis by LIPUS.

Abstract ID: 2287533

Preventing biofilm formation by exposure of oral bacteria to silver nanoparticles

Donald Schwass

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Nominated IADR Scientific Category: Cariology Research - Microbiological Studies / Biofilm

Poster session: General (GP21), Tuesday

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Keywords: silver nanoparticle, biofilm, prevention, crystal violet assay.

Objectives: To investigate the potential of a novel silver nanoparticle formulation to prevent biofilm formation. Methods: *In vitro* monoculture biofilms of *Enterococcus faecalis* and multiple *Streptococcus* spp. were grown in 96-well microtitre plates containing brain-heart infusion +/- 20% sucrose, at 37°C for 48 hr under anaerobic conditions. Monodisperse silver nanoparticle (6.7- 9.2 nm) suspension with an effective silver concentration of 9.4 μ g/ml was added to experimental cultures. The resulting biofilm mass was determined by the crystal violet assay and compared to biofilms grown (i) in the absence of inhibitory agents (negative control) and (ii) with 70% isopropanol (positive control).

Results: Monoculture biofilms were successfully generated for all microorganisms tested. In the presence of silver nanoparticles, for *S. gordonii* DL1, C219, G102 and ATCC10558 strains, *S. mutans* UA159, *S. mitis* I18 and *E. faecalis* JH22, both planktonic and biofilm growth was prevented. Biofilm mats formed by *S. oralis* ATCC6249 and ATCC9811, and *S. sanguinis* D1 and ATCC10556, detached during vigorous washing so the crystal violet assay could not be used. However, direct observation of the wells indicated that biofilm formation was also prevented for these organisms when silver was present. The presence of sucrose did not influence the sensitivity of any of the bacteria.

Conclusions: A monodisperse preparation of silver nanoparticles prevented several *Streptococcus* spp. and *E. faecalis* from forming biofilms. This preparation has potential for clinical application inhibiting oral biofilms.

Abstract ID: 2335393

Panoramic Radiology. New method of patient instruction reduces palato-glossal airspace

Antonia Scott

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Nominated IADR Scientific Category: Diagnostic Sciences

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC13), Monday

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Keywords: Radiography panoramic, Diagnostic errors, Patient positioning, Tongue Physiology.

Objectives: Palatoglossal airspace PGA is the most prevalent of the positioning errors on panoramic radiographs. This may hide or mimic pathology especially in the maxilla. Traditional patient instruction to hold the tongue on the roof of the mouth is often not understood, or unable to be maintained by most patients. A simple breathing technique was found to be useful with patients of all ages, or with disabilities and non-English speaking backgrounds. The aim of this study is to determine the effect of the new instruction-method on diagnostic quality of Digital Panoramic radiographs

Methods: A retrospective, random selection, cross-over study of digital panoramic radiographs taken by students and staff, comparing Quality Assessment (QA), PGA and other positioning errors on 200 radiographs using New patient instruction-method compared to earlier panoramic images of those same patients taken with the traditional method 2009-2014. Each radiograph was given a QA score

of 1= excellent 2= clinically acceptable 3= undiagnostic. PGA was scored for no air space, airspace covering < 6 apices, airspace covering > 6 apices, airspace on one side only. Presence or absence of pharyngeal airway space overlying the ramus was recorded.

Results: Early pilot study showed that the severity and incidence of the Palato-glossal airway space was reduced with the new technique.

Conclusions: The most important advantage of the new instruction method will be to produce more diagnostic images, reduce the need for further radiographs, reduce missed and mistaken pathology in the maxilla and improve patient outcomes.

Abstract ID: 2338388

Effect of anodized titanium-zirconium implants on osseointegration – a sheep study

Ajay Sharma

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Nominated IADR Scientific Category: Implantology Research

Colgate Award entrant

Poster session: Senior, Basic Research (CSB14), Monday

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Keywords: titanium-zirconium, anodization, sheep model.

Objectives: To electrochemically modify titanium-zirconium (TiZr) discs, investigate surface characteristics of anodized layer and its effect on osseointegration by sheep study

Methods: Titanium (Ti) and TiZr discs with smooth, polished surface were anodized in an electrolyte containing DL- α -glycerophosphate disodium salt (DL- α -GP) and calcium acetate (CA) at 60mA/cm² and 300V. The surface characteristics were analyzed by electron dispersive spectroscopy (EDS), scanning electron microscopy (SEM),

atomic force microscopy (AFM) and goniometry. To assess biocompatibility in an intraosseous environment, the anodized TiZr discs were implanted in sheep femur epicondyles. A novel animal model design with custom-made surgical template was developed to simultaneously study the percentage of bone-to-implant contact and new bone fill. Results: Following anodization there was a distinct change in surface topography with well-formed oxide layer and bimodal porous surface. EDS showed the anodized surface was mainly composed of titanium, zirconium, oxygen, calcium and phosphorus. SEM analysis revealed that nano-to-microporous structures dominated the anodized titanium-zirconium (aTiZr) and titanium (aTi) surfaces. The porosity and pore density values of aTi and aTiZr surfaces showed no significant difference between the groups ($p > 0.05$). However, a statistically significant higher number of pores < 1 μ m² was present on aTiZr compared to aTi ($p < 0.001$, 't' test, n=3). There was a relative reduction in contact angle following anodization indicating increased hydrophilicity. Histologically there was new bone-to-implant contact on all implants, slightly more pronounced on anodized implants. The percentage bone-to-implant contact measurements of anodized implants (aTi=40.55, aTiZr=47.26) were higher than machined implants (Ti=37.05, TiZr=35.18), but there was no significant difference between the two groups with anodized surfaces ($p > 0.05$, 't' test, n=10).

Conclusions: The present histomorphometric and histological findings confirm that anodization of TiZr was biocompatible with significantly higher percentages of bone implant contact and new bone fill compared to unmodified TiZr surfaces but similar to aTi.

Abstract ID: 2338298

Histomorphometric analysis of zirconia implants in the jaw of sheep

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Nominated IADR Scientific Category: Implantology Research

Colgate Award entrant

Poster session: Senior, Basic Research (CSB15), Monday

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Keywords: One-piece titanium, One-piece zirconia, Sheep mandible, Histomorphometry, Bone-implant-contact.

Objectives: Reports have documented titanium (Ti) hypersensitivity after dental implant treatment. Alternative materials have been suggested including zirconia (Zr) ceramic, which has shown predictable osseointegration in animal studies and appears free of immune responses.

The aim of the research was to investigate the bone implant contact (BIC) of one-piece Zr, compared with one-piece Ti implants placed in the jaws of domestic sheep.

Methods: Ten New Zealand mixed-breed sheep were used. Titanium (control n=10) and Zirconia (test n=10) one-piece prototype implants were placed using one-stage trans-gingival protocol into the post-extraction edentulous posterior mandible of each sheep. After a healing period of 12-weeks, resin-embedded undecalcified sections were prepared. Bone-to-implant contact was measured on two sections per implant using image analysis software. Results: Gross histological evaluation of the Ti mandibular implants showed 7/10 implants were integrated, while the other three were failing. On the other hand, 3/10 Zr implants had failed and been lost, 2/10 were not integrated, one was failing and only 4/10 could be considered successfully integrated. No statistical significant difference was found ($p=0.18$). Overall bone-implant integration was $11/20 = 55\%$. Zirconia implants in the mandible showed comparable %BIC to titanium implants (72.2%, SD 23.7 versus 60.3%, SD 22.4) ($p=0.087$).

Conclusions: The high failure rate in the mandible could be attributed to the implant design (one-piece), the structural morphology of the sheep mandible and unfavourable forces of mastication. The outcomes of this research supported the results of other studies that have demonstrated higher failure rates of one-piece zirconia implants in clinical conditions. Further clinical trials are recommended to evaluate the performance of zirconia implants under loading conditions.

Abstract ID: 2335246

Proangiogenic therapy as a treatment modality in the management of BRONJ

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Nominated IADR Scientific Category: Periodontal Research - Therapy

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC14), Monday

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Keywords: Bisphosphonates, Rat model, Angiogenesis, Differentiation, Hydrogel.

Objectives: Bisphosphonates (BPs) are known to have a direct effect on the local vasculature, but their effect on the differentiation of progenitor cells into endothelial cells, which may ultimately contribute to the pathogenesis of bisphosphonate-related osteonecrosis of the jaw (BRONJ), is unknown. This study evaluated both the *in vitro* effect(s) of differing potency bisphosphonates on the differentiation of human placenta-derived mesenchymal stem cells (pMSCs) into an endothelial lineage and the *in vivo* effect of locally delivered VEGF on a healing extraction socket in a BRONJ rat model.

Methods: The effect of different concentrations of clodronate (CLO), alendronate (ALN) and zoledronate (ZA) on pMSC proliferation and viability was assessed to determine the appropriate non-cytotoxic concentrations for subsequent differentiation studies. pMSC differentiation in endothelial media (+ VEGF) was assessed by LDL uptake assay, Von Willebrand factor immunofluorescence staining and endothelial marker gene expression analysis. Functional morphogenic assessment of the endothelial cells was assessed by tube formation assay. *In vivo*, the local delivery of VEGF using a hyaluronic acid hydrogel placed in a molar

extraction socket of ZA treated rats was evaluated histologically after four weeks of healing.

Results: ALN and ZA had a significant inhibitory effect on pMSC endothelial gene expression, cell migration and the resultant endothelial phenotype. Furthermore, both ALN and ZA were shown to significantly inhibit subsequent endothelial tube formation by VEGF treated pMSCs. In vivo, wound healing as evidenced by increased vascular density in ZA treated rats was significantly enhanced by the VEGF hydrogel.

Conclusions: This study provides new evidence supporting a multi-modal effect of BPs on angiogenesis, which may be involved in the pathogenesis of BRONJ. Further, local delivery of angiogenic agents is a potential therapeutic approach the prevention and management of BRONJ lesions.

Abstract ID: 2333635

Aetiology of Molar Incisor Hypomineralisation and Hypomineralised Second Primary Molars – A Systematic Review

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Nominated IADR Scientific Category: Pediatric Oral Health Research

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC15), Monday

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Keywords: Dental Enamel Hypoplasia/etiology, Dental Enamel/abnormalities, Risk Factors.

Objectives: To assess the strength of evidence linking aetiological factors for Molar Incisor Hypomineralisation and Hypomineralised Second Primary Molars (MIH/HSPM).

Methods: A systematic search was conducted using the Medline/PubMed and Embase electronic databases for studies investigating environmental aetiological factors of MIH/HSPM in children. Two reviewers assessed the eligibility of studies. The level of evidence and bias was determined for eligible studies according to Australian National Health and Medical Research Council guidelines for systematic reviews of aetiology.

Results: Of a total 2235 studies identified through electronic and hand searching, 108 fulfilled the screening criteria based on title and abstract. Of these, 30 were eligible based on the full text of the report, and were assigned a score for the level of evidence and bias. There were no studies with level I evidence, 7 studies with level II evidence, 18 studies with level III evidence and 5 studies with level IV evidence. Only level II, prospective cohort studies were included in the qualitative synthesis to ensure the highest quality review.

Of the seven included studies, five investigated MIH and two investigated HSPM. Four out of the five studies of MIH focused on the role of prolonged breastfeeding, with three revealing a positive association and one contradicting these by failing to find any such link. The fifth study indicated a positive association between respiratory disease in childhood and MIH. The studies investigating HSPM revealed a strong positive association with maternal alcohol consumption in pregnancy, fever in the first year of life and ethnicity but no association with the use of medications during pregnancy. Conclusions: There is a need for further prospective cohort studies of the aetiology of MIH/HSPM. Respiratory diseases and prolonged breastfeeding may be associated with higher risk of MIH. Maternal alcohol consumption and fever in the first year of life may be positively associated with HSPM.

Abstract ID: 2335395

Survey of digital panoramic radiographs: Quality assessment, faults and pathology

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Nominated IADR Scientific Category: Diagnostic Sciences

Poster session: General (GP22), Tuesday

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Keywords: Panoramic radiography, Diagnostic errors, Education dental, Pathology Oral, Diagnosis Oral.

Objectives: Panoramic images are used to evaluate the whole dentition and surrounding hard and soft tissues of the head and neck. Surveys have shown that film fault (errors) rate is between 70-99%, with patient positioning errors being the most common. However, these surveys were based on Panoramic Film Images with many processing errors and did not include a Quality Assessment (QA) rating of the images. Few articles have examined the effect of film faults on misdiagnosis of the patient but it is known that the Palato-glossal airspace affects the reading of the maxillary dentition

The aim is to determine the ability of dental practitioners and dental students to recognise the following in digital panoramic radiographs: Film Faults (FF); Pathology; and Quality Assurance (QA).

Methods: A survey of six digitally acquired panoramic radiographs with a questionnaire was used as a formative learning exercise by DMD2, 3 and 4 dental students in the Faculty of Dentistry, University of Sydney. Images were viewed on a computer monitor to accurately recognise the QA of each digital panoramic image; to identify the most significant film fault that may hinder diagnosis; to identify any significant pathology present. A previous pilot study by staff dentists, using the same images in an online survey was compared.

Results: Palato-glossal airspace was recognised by students to be one of the most significant errors. Students who had most recently attended lectures on Panoramic Imaging performed better than staff dentists on the recognition of the most significant faults and recognition of pathology in the maxilla and neck regions.

Conclusions: The Dento-Maxillo Radiology instruction using a combination of lectures, eLearning and clinical teaching sessions improves the diagnostic capabilities of junior dental students and highlights the importance of continuing education for all dentists.

Abstract ID: 2329274

Efficacy and time kill assay of 0.05% cetylpyridinium chloride mouth rinse

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Nominated IADR Scientific Category: Microbiology & Immunology

Poster session: General (GP23), Tuesday

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Keywords: bacteria, mouth rinse, halitosis.

Objectives: To investigate an efficacy of the anti-bacterial activity of 0.05% cetylpyridinium chloride (CPC) mouth rinse and time kill assay on bacteria causing periodontitis and halitosis.

Methods: The bacteria causing periodontal disease and halitosis were isolated from 15 healthy adult volunteers (20-55 years old) who had a mean gingival index >1.75. Fresh clinical isolates plaque was collected from four sites of the first lower molar. Pooled plaque were used for anaerobic culture. Total count of bacterial colonies was determined on

brain heart infusion agar. Bacterial isolates were identified by gram stain and biochemical test. Agar disc diffusion assay and broth dilution assay was used to test the inhibitory efficacy of 0.05% CPC mouth rinse (Fluocaril Zero Alcohol mouthwash). Time killing assay was performed using dilution spread plate technique.

Results: 1.2×10^5 - 1.77×10^7 colony forming unit/ml of bacteria was found after cultivation of bacteria. *Streptococcus* sp., *Staphylococcus* sp., *Micrococcus* sp., *Lactobacillus* sp., *Corynebacterium* sp., *Actinomyces* sp., *Fusobacterium* sp., *Prevotella* sp., *Aggregatibacter* sp., *Porphyromonas* sp., *Klebsiella* sp. and *Moraxella* sp. bacteria were identified by biochemical tests. Periodontitis and halitosis related bacteria; *Prevotella* sp. and *Porphyromonas* sp. were selected to study. 0.05% CPC mouth rinse could inhibit the bacteria with diameters of inhibition zones ranging from 19.7 - 30.3 mm. Minimum inhibitory concentrations of mouth rinse against the bacteria were 0.013-0.025% CPC and minimum bactericidal concentrations were 0.025% CPC. When testing at 30 seconds, growth of *Prevotella* sp. (isolate 1MI2) and *Porphyromonas* sp. (isolate 2MI3) were inhibited by 65.42 and 75.29 %.

Conclusions: 0.05% CPC mouth rinse is effective in inhibiting periodontitis and halitosis related bacteria. Time kill of these bacteria at 30 seconds ranging from 65.42-75.29%.

Abstract ID: 2303337

Community Pharmacists' Knowledge Regarding Dry Mouth

Margaret Stacey

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

Poster session: General (GP24), Tuesday

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Keywords: pharmacist, dry mouth, knowledge.

Objectives: To investigate the knowledge of Victorian Community Pharmacists regarding dry mouth.

Methods: A questionnaire was posted to each community pharmacy in Victoria (n=1310). It was requested that one pharmacist from each pharmacy complete the questionnaire. No stipulation was given regarding which pharmacist at pharmacies with multiple pharmacists should complete the questionnaire. Pharmacists were asked to record the three main causes of dry mouth, and the consequences of having a dry mouth.

Results: Five hundred and twenty-eight pharmacists (age range 21 to 78 years; 52% female, 48% male) responded to the questionnaire. Pharmacists' knowledge of the three main causes of dry mouth was categorised into nine groups, with the percentage of pharmacists reporting Drugs (98.3%), Medical Conditions (48.3%), Dehydration (38.1%), Age-related (33.7%), Cancer Treatment (16.7%), Oral/Dental Cause (16.5%), Sleep-related/Mouth Breathing (11.6%), Lifestyle (9.8%), Other (9.1%). Oral/Dental Causes included gum disease, poor oral hygiene, oral appliances, dental work, nonspecific dental/tooth problems and nonspecific oral problems. Pharmacists' knowledge of the consequences of dry mouth was categorised into seven groups with the percentage of pharmacists reporting Oral/Dental Diseases (64.2%), Nutritional/Functional Problems (58.5%), Pain/Discomfort (38.6%), Decreased Quality of Life (7.6%), Psychological/Behavioural Issues (7.0%), Sleep Disturbance (4.2%) and Thirst (4.2%). The most frequently recorded Oral/Dental Disease was caries (30.5%), and the most frequently recorded Nutritional/Functional Problem was halitosis (32.6%).

Conclusions: Knowledge of the causes and consequences of dry mouth in this sample of Victorian Community Pharmacists was good in general. A minority of pharmacists had some misconceptions regarding oral/dental causes of dry mouth.

Abstract ID: 2338690

Effects of Tooth Mousse Plus on Dental Plaque During Orthodontics

Sepehr Tabatabaee

University of Queensland

Nominated IADR Scientific Category: Cariology Research - Demin/Remineralization

Poster session: **General (GP25), Tuesday**

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Keywords: CPP-ACFP, Plaque, Orthodontics.

Objectives: To assess changes in dental plaque area, thickness and acid production caused by CPP-ACFP topical crème (GC Tooth Mousse Plus) (TMP) over a 4 week period during fixed orthodontic treatment, using multi-colour plaque disclosing

Methods: 64 patients were randomized to 3 groups. 21 received TMP, 22 received an identical placebo lacking CPP-ACP but containing 900 ppm F, and there were 21 untreated controls. Subjects used a pea size volume of creme after brushing before bed time. Plaque was stained with GC Tri Plaque ID Gel and photographed in a standardized manner at baseline and after 28 days. Areas of thin (pink), mature (violet) and acid producing (light blue) plaque biofilm in the cervical half of the maxillary anterior teeth above the archwire were analyzed using Adobe Photoshop. Pixel area percentage data were analyzed in a blinded manner. Changes were compared for the same site over time. Product use was assessed by weighing tubes

Results: There were no adverse effects seen or reported. Groups were not significantly different at baseline for demographic or plaque parameters. Usage of active and placebo crème was not different. TMP caused a significant reduction in total plaque area, mature plaque area, and acid producing plaque area (all $P < 0.0001$ according to the Wilcoxon matched-pairs signed-ranks test). When segregated according to product usage, there was a dose response for these TMP effects, with low users (mean 0.11 g/day) showing lesser benefits than high users (mean 0.30 g/day). In the placebo and control groups, there were

increases in the areas of total, mature and acid-producing plaque
Conclusions: Daily use of TMP containing 900 ppm F exerts beneficial ecological effects on dental plaque which are due to CPP-ACP and not from the fluoride or other vehicle components. Supported by the ASO and CRC Oral Health

Abstract ID: 2350672

Periodontal Status of the Residents of San Isidro Care Center (Auriligo) Guadalcanal Province, Solomon Islands

Rachael Taloni

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Nominated IADR Scientific Category: Behavioral, Epidemiologic, and Health Services Research

Colgate Award entrant

Poster session: **Junior (CJ17), Monday**

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Keywords: periodontal, oral hygiene, solomon islands.

Objectives: To assess the Periodontal status and Oral hygiene practices of the Residents of San Isidro care center in Auriligo, Guadalcanal Province in the Solomon Islands.

Methods: A total of 30 students participated in the study. It was a cross sectional study utilizing questionnaire based interviews and oral examination to assess Clinical attachment Loss among the participants. Two stations had been set up one for oral examination and the other for interview, based on the questionnaires that had been constructed. Each station had teachers to aid in interpretation of the sign language. Natural light, dental mirror, WHO probe, dental explorer, dental tweezers, gloves and masks were used for oral examination. Savlon was diluted in water for disinfection of the instruments.

Results: The results show that out of the 30 participants 60% had periodontal diseases, and 86.7% had generalized plaque induced moderate gingivitis. 76.7 % had mild generalized gingivitis, 50 % moderate and 3.3 % with severe periodontal

disease. 76.7% had never been to a dental clinic. 83.3% state that they use toothbrush with toothpaste and 26.7% state that traditional methods were used. 50% had a score of 0 for CAL, 10% a score of 1 and 6.7% a score of 3.

Conclusions: There were significantly poorer levels of oral hygiene and a greater prevalence of periodontal diseases in this population. Therefore, the Ministry of Health in the Solomon Islands need to address this problem by organizing dental visits frequently after every three to six months to such institution in order to educate them on their oral hygiene status, practices and prevalence of oral diseases.

Abstract ID: 2331644

Effect of TGF- β 1 on osteoclast precursors in the bone microenvironment

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Nominated IADR Scientific Category: Craniofacial Biology

Poster session: General (GP27), Tuesday

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Keywords: bone microenvironment, osteoclast, TGF- β 1.

Objectives: Osteoclasts (OC) are differentiated from monocyte/macrophage-lineage hematopoietic precursor cells which were termed OC precursors (OPs). Previous studies have revealed key molecular signals, such as those mediated by M-CSF and RANKL that regulate OC differentiation. Although many molecules are known to contribute to OC differentiation, the mechanisms controlling the recruitment and homing of OPs to the bone surface have not been elucidated. Therefore, the aim of this study was to determine the effects of TGF- β 1 on motility of OPs in the bone microenvironment.

Methods: We used the pre-osteoclastic RAW264.7 (RAW) cells in this study. Morphological changes of RAW cells were analyzed by light microscopy. Cell motility was measured

using cell motility assay. Rho, Rac1 and Cdc42 were detected by Western blot analysis.

Results: RAW cells differentiated into osteoclast-like cells in the presence of RANKL. The round shape of RAW cells changed into a spindle shape by treatment with TGF- β 1. The cell motility of RAW cells was decreased by treatment with TGF- β 1. When TGF- β signal was inhibited by adding the potent and specific inhibitor of the kinase activity of TGF- β 1 receptor, SB431542, to the medium during the culture period, osteoclastogenesis and morphological changes were suppressed. Western blot analysis revealed that Rac1 production in RAW cells was inhibited by TGF- β 1. Conclusions: These results suggest that TGF- β 1 is released from the bone matrix induce motile OPs to quiescent OPs. TGF- β 1 controls motility of OPs and may induce their localization in bone microenvironment.

Abstract ID: 2327370

Experimental and numerical analysis of convergence angles in crown preparations

Janine Tiu

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Nominated IADR Scientific Category: Prosthodontics Research

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC16), Monday

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Keywords: crown preparation, total occlusal convergence, finite element analysis, axial loading, glass ceramic.

Objectives: Total occlusal convergence (TOC) angles are important geometric parameters in tooth crown preparations. Angles as high as 60° TOC are commonly prepared by general dentists, yet studies have not

investigated the effects of such high angles. The objective is to understand the mechanical effects of extreme TOC values without other influencing parameters such as marginal or occlusal support using experimental and numerical methods.

Methods: Experimental setup consisted a compression test of precrystallized glass-ceramic non-anatomical crowns milled with 10o, 30o, and 60o TOC (n=90) on steel alloy abutments with 500N at 0.2mm/min until fracture. Numerical setup consisted of a finite element (FE) model with the same experimental dimensions meshed with 0.4mm 3D tetrahedral elements assumed homogenous and isotropic. TOC angles were tested in 5o increments from 5o to 60o and loaded in an axial direction with 700N.

Results: Experimental and numerical analysis concluded that the model with 60o TOC had the highest initial fracture load (>300N) while the lower TOC values had lower fracture loads (<190N). The extended FE results exhibited reasonably good agreement with the experimental fractographic analyses for both force-displacement curves and fracture patterns with cracks initiating at the internal surface propagating radially to the outer surface.

Conclusions: This study found that the higher TOC angled restorations provided better support during axial loading. In contrast, the lower TOC angles demonstrated wedging-type conditions. Nevertheless, the mechanisms are multifactorial when TOC is combined with other parameters such as margin width and will require further investigation.

Abstract ID: 2343783

Oral Health Education in a Justice Health Facility.

Julie Tran

The University of Sydney

Nominated IADR Scientific Category: Oral Health Research

Colgate Award entrant

Poster session: Junior (CJ13), Monday

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Keywords: Dental Health Education, Oral Hygiene.

Objectives: Individuals in criminal justice facilities have a higher risk of oral health conditions. Incarcerated individuals in mental health facilities are particularly vulnerable to such conditions due to high rates of communicable and chronic risk factors. This project aimed to address dental risk factors and improve oral health through both patient and staff education in the Elouera Rehabilitation unit of the Forensic Hospital in Sydney.

Methods: A needs analysis was conducted through interviews with facility health workers and group discussions with the patients. From the information gathered, a staff presentation was designed to equip the health workers with the knowledge required to understand common oral health conditions and to provide oral health support for the patients. Post-evaluation surveys were issued to all staff to determine the success of the presentations. A patient presentation was also designed to address oral hygiene, reduce risk factors associated with oral disease and empower patients to value oral health. Patients then provided verbal feedback following the presentation.

Results: All 19 Elouera patients attended the patient presentation and 8 staff members attended the staff presentation. In the post-evaluation survey all staff agreed that they had 'an improved level of understanding' in the following areas: oral health risk factors; dental calculus; discussing oral hygiene with patients; and preventative health. Patients responded to the presentation with enthusiasm and all participants reported an increased level of understanding about oral health. Nurses and the principal dentist reported marked improvements in their oral hygiene practices and understanding of oral health.

Conclusions: The education program conducted at Elouera Rehabilitation unit revealed how a positive and motivational approach to oral health promotion can increase understanding of oral health risk factors and diseases, and improve motivation for self-care and compliance in a correctional facility.

Abstract ID: 2343912

Dental treatment need of hearing impaired students attending Gospel school of the deaf Suva, Fiji.

Venina Vokitia

College of Medicine Nursing and Health Sciences, Fiji National University

Nominated IADR Scientific Category: Education Research

Colgate Award entrant

Poster session: Junior (CJ14), Monday

Authors/Institutions: V. Vokitia, Oral Health, College of Medicine Nursing and Health Sciences, Suva, FIJI

Keywords: Dental treatment Need, Hearing Impairment.

Objectives: This study aims to identify the dental treatment needs for students with hearing impairment at Gospel School of the Deaf

Methods: A modified WHO oral examination form was used to examine a sample size of 44 students, aged 5-18 years, attending Gospel School of Deaf, Suva. Three Bachelor in Dental Surgery fifth year students from the Fiji National University were calibrated (Kappa value of 0.85) before conducting oral examination. Secondary Data was used to obtain the results of the study whereby a modified WHO oral examination form was used by the two co- investigators to collect on the periodontal health and dentition status of the study population. The main criteria for treatment needed was broadly categorized into conservative treatment, Dental Extraction, Scaling, Preventative Treatment. EpiData was used to enter and analyze the results of the study.

Results: Based on the prognosis of the information acquired from Gospel school of the deaf (Data collection is in progress), the study population reported 80% of the children were caries free and only a few needed preventative procedures.

Discussion: Studies reported higher levels of dental disease was due to complete deprivation in the provision of dental care and will continue to be a challenge in the 21st century. Several studies document the presence of significant communication barriers between providers of care and

patients with disabilities. For these patients the clinical consequences of communication difficulties may include misunderstanding of the diagnosis or direction of self-care, poor patient adherence to treatment recommendations and less than optimal clinical outcomes. Coordinated efforts between educational, social services and oral health care sectors are required to ensure that these young people get appropriate support and care. Further, dental treatment should be personalized.

Conclusions: The study reported good oral health status on children with hearing impairment.

Abstract ID: 2339103

Effects of abutment screw torque on peri-implant bone strain

John Neil Waddell

Sir John Walsh Research Institute, University of Otago

Nominated IADR Scientific Category: Implantology Research

Poster session: General (GP28), Tuesday

Authors/Institutions: B. Al-Amleh, J.N. Waddell, Oral Rehabilitation, Sir John Walsh Research Institute, Dunedin, NEW ZEALAND; J.J. Giauque, E.S. Feller, Arizona School of Dentistry and Oral Health, Still Circle Mesa, Arizona, UNITED STATES

Keywords: angled abutments, torque.

Objectives: To evaluate the effects of implant abutment screw torque on the micro strain distribution in peri-implant bone caused by a 25° angled screw channel (ASC) versus a conventional straight long axis screw channel. Screw damage and reusability was also investigated.

Methods: An edentulous maxilla was fabricated using an epoxy resin with similar E-modulus to cortical bone. A NobelActive RP implant (5 X 11.5 mm) was bonded into the right maxillary molar region. Four linear strain gauges were attached on the crestal region around the implant on the mesial, distal, buccal, and lingual aspects. Omnigrip Clinical Screws were used to screw two NobelProcera monolithic full-contour zirconia implant crowns, one with an ASC of

25o, (n=5) and one with a screw channel of 0o (n=5). An electric Surgic Pro handpiece (20 RPM) was used to torque down each screw (35 Ncm) using an Omnigrip screwdriver. Mean micro strain was measured (ANOVA, P<0.05) and all screws were examined under SEM for damage. The process was subsequently repeated until all the angled screws failed to achieve 35 Ncm torque.

Results: Strain distribution to the surrounding bone showed no significant difference between the ASC and straight screw channel. Three ASC screws failed at the 4th torque down, two at the 5th, while all straight screws exceeded that. Extensive damage and rounding was observed under SEM in the ASC screw heads with very little to no damage seen on the straight channel screws.

Conclusions: Initially, both angled and straight access screws achieved the recommended torque with no significance difference in micro strain distribution in the surrounding peri-implant bone. However, repeated use of angled screws should be avoided due to excessive damage to the screw heads caused by the Omnigrip screwdriver thereby preventing the achievement of 35 Ncm torque.

Abstract ID: 2315539

Inhibition of adhesion of oral bacteria to immortalized human gingival fibroblasts (HGF-1) by tea extracts

Yi Wang

University of Queensland

Nominated IADR Scientific Category: Microbiology & Immunology

Colgate Award entrant

Poster session: Senior, Basic Research (CSB16), Monday

Authors/Institutions: Y. Wang, L.P. Samaranayake, School of Dentistry, University of Queensland, Brisbane, Queensland, AUSTRALIA; G. Dykes, Monash University, Melbourne, Victoria, AUSTRALIA;

Keywords: Tea, Adhesion, Gingival fibroblasts, Oral bacteria.

Objectives: Tea has been suggested to promote oral health by inhibiting bacterial adhesion to the oral cavity. Most studies have focused on prevention of bacterial adhesion to hard surfaces such as enamel. This study investigated the effect of five commercial tea (green, oolong, black, pu-erh and chrysanthemum) extracts on the adhesion of five oral bacterial strains (*Streptococcus mutans* ATCC 25175, *Streptococcus mutans* ATCC 35668, *Streptococcus mitis* ATCC 49456, *Streptococcus salivarius* ATCC 13419 and *Actinomyces naeslundii* ATCC 51655) to the HGF-1 gingival cell line.

Methods: In order to determine a suitable concentration of the tea extracts that does not kill or inhibit both the HGF-1 cells and the bacteria, the cytotoxicity of the tea extracts against HGF-1 cells and the minimum inhibitory concentration of the tea extracts against the bacteria were first tested using crystal violet assay and broth-dilution assay, respectively. In the adhesion assay, the bacteria were incubated with HGF-1 cells with or without the tea extracts in a 24-well plate for 30 min. The HGF-1 cells with adhered bacteria were then detached from the wells using trypsin-EDTA and plated on tryptic soy agar to quantify the attached bacteria.

Results: Compared with the controls, pu-erh and chrysanthemum tea extracts significantly reduced the adhesion of all *Streptococcus* strains, but not the *Actinomyces* strain, by up to 4 log CFU/well without killing or inhibiting HGF-1 cells. The effects of other tested tea extracts were negligible.

Conclusions: Pu-erh and chrysanthemum teas have the potential to reduce the adhesion of oral pathogens to gingival tissues and may play a role in improving oral health.

Abstract ID: 2343763

An evaluation of the change in quality of life of children after dental extraction under general anaesthesia.

Susan Wong

University of Western Australia

Nominated IADR Scientific Category: Pediatric Oral Health Research

Colgate Award entrant

Poster session: Senior, Clinical/Preclinical (CSC17), Monday

Authors/Institutions: S.S. Wong, N. King, R. Anthonappa, Paediatric Dentistry, School of Dentistry, University of Western Australia, Perth, Western Australia, AUSTRALIA; M. Ekambaram, Paediatric Dentistry, Faculty of Dentistry, The University of Hong Kong, Hong Kong, HONG KONG; J.C. Winters, Dental Department, Princess Margaret Hospital, Perth, Western Australia, AUSTRALIA; C. McGrath, Public Health Dentistry, Faculty of Dentistry, The University of Hong Kong, Hong Kong, HONG KONG

Keywords: Quality of life, ECOHIS, Pre-school children, Dental treatment, General anaesthesia.

Objectives: To assess the changes in the OHRQoL of preschool children who presented to the emergency department for dental conditions and underwent dental extractions under general anaesthesia (GA).

Methods: 221 healthy preschool children, who had emergency dental extractions under GA, were recruited over a period of 12 months. The ECOHIS questionnaire was completed by the same parent or caregiver both prior to the GA and at the 2- week post-treatment visit. Data was analyzed using repeated ANOVA with adjustments for multiple comparisons using the Bonferroni tests with the significance level set at 5%.

Results: 126 participants, with a mean age of 4.02 and a mean dmft score of 8.27 (SD = 4.13), completed the 2-week post- treatment questionnaires. The overall ECOHIS, CIS, and FIS scores decreased significantly ($p < 0.001$) after emergency extractions under GA, demonstrating large effect sizes. The biggest decrease in prevalence after emergency dental extractions under GA was observed for the items of pain in teeth, trouble sleeping, being irritated or frustrated, difficulty drinking food, and parents being upset.

Conclusions: The OHRQoL of preschool children, who presented to the emergency department for dental conditions, was significantly improved following dental extractions under GA.

Abstract ID: 2307166

A novel scaffold containing calcium polyphosphate and silk fibroin for bone tissue engineering

Huixu Xie

College of Medicine and Dentistry, James Cook University; West China School of Stomatology, Sichuan University

Nominated IADR Scientific Category: Dental Materials 3: Ceramic-based Materials and Cements

Colgate Award entrant

Poster session: Senior, Basic Research (CSB17), Monday

Authors/Institutions: H. Xie, J. Xu, Q. Ye, College of medicine and dentistry, James Cook University, Cairns, QLD 4878, Australia, Cairns, Queensland, AUSTRALIA; H. Xie, West China School of Stomatology Sichuan University, Sichuan Chengdu 610041, China, Chengdu, CHINA

Keywords: Silk Fibroin, Calcium Polyphosphate, Biodegradability, Mechanical strength.

Objectives: Bioceramics have been extensively used for bone repairing and regeneration as a scaffold of bone tissue engineering. Despite bioceramics possess good biocompatibility and osteoconduction, they do not fulfill one of the key requirements for the complex bone engineering: osteointegration. Therefore, it is our goal to develop a new composite of bioceramics with osteointegration potential.

Methods: In this study, silk fibroin was applied to calcium polyphosphate through a simple crosslinking method. As a result, a novel bone repair scaffold based on the combination of silk fibroin (SF) and calcium polyphosphate (CPP) composite is developed. SF and CPP scaffolds with or without glutaraldehyde were blended together. The composite scaffolds were characterized by Fourier transform infrared spectroscopy, XRD and SEM in order to reveal their composition, size distribution and surface morphology. Compressive strength and degradation tests were assessed to evaluate the mechanical and chemical stabilities of SF/CPP *in vitro*. The cell biocompatibility was measured with respect to the cytotoxicity of the extractions of scaffolds. The SF/CPP scaffolds yield a higher compressive strength and the degradation behavior after silk fibroin doped into CPP

structure. In vivo bone implantation was performed to evaluate the biodegradability, osteoconductivity and osteointegration of the new scaffold, and the bone formation examined by using X-ray radiography.

Results: The results indicated that the obtained SF/ CPP scaffolds exhibited a better cell biocompatibility and tissue biocompatibility than the conventional biomaterials such as CPP and hydroxyapatite (HA) scaffolds. The in vivo immunohistochemistry staining for VEGF also showed that SF/ CPP had a potential to promote the formation of angiogenesis and the regeneration of bone.

Conclusions: Considering the suitable mechanical properties, good osteointegration and easy availability, SF/ CPP could be a promising bone substitute/scaffold for tissue engineering.

Abstract ID: 2343642

Effectiveness of dental students' crown preparations using preparation assessment software

Joyce (Chuan-Chia) Yu

University of Otago

Nominated IADR Scientific Category: Prosthodontics Research

Colgate Award entrant

Poster session: Junior (CJ15), Monday

Authors/Institutions: J. Yu, E. Chin, T. Hung, J. Tiu, D.R. Schwass, B. Al-Amleh, Sir John Walsh Research Institute, University of Otago, Dunedin, NEW ZEALAND

Keywords: crown, preparation, student, software.

Objectives: Success rates of dental crowns are influenced by the clinician's ability to provide a retentive yet conservative preparation. The recommended total occlusal convergence (TOC) angles are between 10o – 20o and a minimal margin width of 1mm for all-ceramic crowns. Conventionally, dental students are provided written/pictorial instructions with the aid of a clinical tutor as part of their preclinical training. The software PreprTM measures the TOC angles and margin widths of scanned preparations in 3D. The aim of this study

is to evaluate the use of PreprTM as an education tool to facilitate the learning process to attain ideal preparation dimensions.

Methods: Thirty students were randomly selected from a pool of interested 4th year dental students from the University of Otago in 2015 and were randomly placed into one of three groups. The control group (A) had access to written /pictorial instructions only, group-B had tutor evaluation, while group-C had access to PreprTM. Each student was given three hours to complete an all-ceramic 46 crown preparation on typodont plastic teeth with selected burs, once a week over four clinical sessions. All preparations were collected and analysed using PreprTM to compare TOC angles and margin widths in buccolingual and mesiodistal aspects.

Results: In session 1, only 10% of participants across all groups achieved acceptable TOC angles. By session 4, 70% of participants in group-C achieved acceptable TOC angles, compared to 20% in group-A and no improvement in group-B. In session 1, acceptable margin widths were achieved by 20% in group-A, 30% in group-B, and 40% in group-C. By the session 4, group-C had 60% achieving acceptable margin widths.

Conclusions: With the addition of software, more participants in group-C were able to achieve recommended TOC angles and margin widths compared to students working independently or with tutor guidance.

Abstract ID: 2325530

Effect of Zoledronic Acid on Angiogenic Gene Expression by Osteoclasts

Sobia Zafar

University of Otago

Nominated IADR Scientific Category: Periodontal Research - Therapy

Colgate Award entrant

Poster session: Senior, Basic Research (CSB18), Monday

Authors/Institutions: S. Zafar, G. Seymour, B. Drummond, M.P. Cullinan, D.E. Coates, Oral Sciences, University of Otago, Dunedin, Otago, NEW ZEALAND

Keywords: Bisphosphonate Related Osteonecrosis of the Jaw, Angiogenic Gene Expression, Osteoclasts.

Objectives: Bisphosphonate-Related Osteonecrosis of the Jaw (BRONJ) is a well-recognised side effect of nitrogen containing bisphosphonate (N-BP) therapy, which results in non-healing, exposed necrotic alveolar bone. The mechanisms underlying BRONJ are poorly understood. Previous studies have indicated that the mevalonate pathway (MVP) and an anti-angiogenic effect of bisphosphonates may play a role in the pathogenesis of BRONJ. Objective: To determine the effects of zoledronic acid (ZA) on angiogenic gene expression in primary human osteoclast (OST) cells, and to investigate replacement of the MVP with geranylgeraniol (GGOH) in the ZA treated OST cells.

Methods: Methods: Three OST cell lines were generated from peripheral blood mononuclear cells using ACCUSPINTM System-HISTOPAQUE (Sigma). The osteoclast phenotype was confirmed by phase contrast microscopy and tartrate-resistant acid phosphatase staining.

Gene expression profiling was carried out using the RT2 ProfilerTM PCR Array System (SABiosciencesTM). Genes coding for 84 human angiogenic factors were determined. The data were analysed using the SABiosciences Excel template for gene analysis and GraphPad PRISM.

Results: The results revealed that the treatment of OST with ZA caused significant ($p \leq 0.05$, Fold regulation $\geq \pm 2$) up-regulation of the chemokine ligand 10 (CXCL10) gene. However, the co-addition of GGOH with ZA resulted in up-regulation of the integrin alpha V (ITGAV) gene and down-regulation of seven angiogenic genes including platelet cell adhesion molecule (PECAM1), serpin peptidase inhibitor member 1 (SERPINF1), chemokine ligand 1 (CXCL1), chemokine ligand 9 (CXCL9), insulin-like growth factor 1 (IGF1), transforming growth factor beta receptor 1 (TGF β R1) and endoglin (ENG).

Conclusions: Osteoclasts *in vitro* responded to ZA alone and with GGOH by up and down regulating a number of genes, and several families of functional gene groups were identified. These genes may play a role in the pathogenesis of BRONJ.

This project was funded by Maurice & Phyllis Paykel Trust and NZ Dental Association Research Foundation grants.

Presenter index

Presenters are listed in alphabetical order, by surname.

Keynote and Colgate Eminent Lecturer presentations are highlighted.

TIME refers to either the presentation time (for oral presenters) or judging time (for Colgate poster competition entrants). **AUD** = Auditorium, **CR** = Conference Room, **GAL** = ODT Gallery.

When not being judged, Colgate Competition posters are to be displayed in the ODT Gallery from 9am-5pm Monday for viewing during session breaks. General posters are to be exhibited in the ODT Gallery from 9am-5pm Tuesday. Each poster has an allocated posterboard space in the ODT Gallery, matching their poster ID number below.

PRESENTER	INST	PRESENTATION TITLE	TYPE	SESSION	TIME	ID #
Christina Adler	USyd	The oral microbiota: an untapped source for new therapeutics	Oral	S6: Oral Microbiology & Probiotics 1	Tue 2.45-3.00pm, AUD	
Lavanya Ajay Sharma	UOtago	Keratin hydrogels: rheology and biocompatibility with rat dental pulp	Poster	Senior, Basic (Mon)	Mon 11.10am, CR	CSB02
Milad Al Taii	UAdel	Sheep: A suitable model for endodontic regeneration/revitalisation research	Poster	Senior, Basic (Mon)	Mon 11.20am, CR	CSB03
Azza Al-Ani	UOtago	The long face morphology in genetic syndromes	Oral	S11: Craniofacial Biol 2	Tue 4.45-5.00pm, CR	
Mohamad Al-Dujaili	UOtago	Growth Factor Expression in the Rat Condyle	Oral	S11: Craniofacial Biol 2	Tue 4.30-4.45pm, CR	
Mohammad Alansary	UOtago	Primary tooth pulp progenitor cells' characterisation and differentiation potential	Poster	Senior, Basic (Mon)	Mon 11.00am, CR	CSB01
Mohammad Albakry	Najran U	Perceived Sources of Stress, Burnout, and Coping Strategies among Dental Practitioners in Saudi Arabia	Poster	General (Tue)		GP01
Yoshiko Arijji	Aichi-Gak U	Shear-wave sonoelastography for assessing masseter muscle hardness	Poster	General (Tue)		GP02
Himanshu Arora	GriffU	Soft Tissue Dimensional Changes After Immediate Implant Placement And Restoration	Poster	Senior, Clin/Preclin (Mon)	Mon 11.00am, CR	CSC01
Peter Arrow	UAdel	Minimum Intervention Dentistry, child oral health-related quality of life and early childhood caries: a non-inferiority randomised control trial	Oral	S2: BE&HSR 2 - QoL	Mon 2.15-2.30pm, AUD	
Mohd Hafiz Arzmi	UMelb	Poly-microbial biofilms are Candida albicans strain and morphology dependent	Oral	S7: Oral Microbiology & Probiotics 2	Tue 4.00-4.15pm, AUD	
Avadhoot Avadhani	UOtago	Interleukin-17 induces matrix metalloproteinase activation and invasion in oral cancer	Poster	Senior, Basic (Mon)	Mon 11.30am, CR	CSB04
Mirza Baig	CSU	Evaluation of the marginal fit of an in-office digitally produced monolithic ceramic crown system	Oral	S15: Biomechanics & Tissue Engineering	Wed 11.15-11.30am, CR	
Mahmoud Bakr	GriffU	A comparison between the effects of a single Parathyroid Hormone (PTH) injection on the healing of stress fractures after 2 and 6 weeks.	Poster	Senior, Basic (Mon)	Mon 11.40am, CR	CSB05
H.M.H.N. Bandara	UQ	Pseudomonas quorum sensors significantly enhance fluconazole resistance in Candida albicans.	Poster	Senior, Basic (Mon)	Mon 12.00pm, CR	CSB06
Abdullah Barazanchi	UOtago	Porcelain Bonding To Novel 3D Printed Cobalt-chromium: A Pilot Study	Poster	Senior, Clin/Preclin (Mon)	Mon 11.10am, CR	CSC02
Manpreet Bariana	UAdel	Nanoengineered protein-delivery system for craniosynostosis therapy	Poster	Senior, Basic (Mon)	Mon 12.10pm, CR	CSB07
Antonio Barone	UPisa	Translating the science of bone augmentation into clinical practice	Oral	Keynote presentation	Tue 9.00-9.45am, AUD	
Katie Beckwith	UAdel	Associations between school aspects and child oral and general health	Oral	S3: BE&HSR 3 - QoL & Workforce Research	Mon 4.30-4.45pm, AUD	
Vincent Bennani	UOtago	Correlation of pressure and displacement during gingival retraction: an in vitro study	Oral	S12: General (Tue) Dental Research	Wed 9.45-10.15am, AUD	
Kritesh Bhai	FNU	Audit of Molar Endodontic Treatment at Fiji National University (2007/2012)	Oral	S12: General (Tue) Dental Research	Wed 10.30-10.45am, AUD	

PRESENTER	INST	PRESENTATION TITLE	TYPE	SESSION	TIME	ID #
Alan Brook	UAdel	Dental Development is a Complex Adaptive System affected by environmental stress	Oral	S11: Craniofacial Biology 2	Tue 3.30-4.00pm, CR	
Michael Brosnan	UOtago	Parental Perception of Oral Health in Pre-School Children	Oral	S12: General (Tue) Dental Research	Wed 10.15-10.30am, AUD	
Paul Brunton	UOtago	Research: If you can't translate, why bother?	Oral	Keynote presentation	Mon 1.30-2.15pm, AUD	
Victor Butnejski	UAdel	Title of presentation: Investigation of the effectiveness of D-amino acids to disrupt <i>E. faecalis</i> biofilms for root canal treatment	Poster	Junior (Mon)	Mon 11.00am, GAL	CJ01
Richard Cannon	UOtago	Overcoming antifungal drug resistance - a new target	Oral	S7: Oral Microbiology & Probiotics 2	Tue 3.30-3.45pm, AUD	
Catherine Carleton	UOtago	A novel model for exploring craniofacial birth defects	Oral	S11: Craniofacial Biology 2	Tue 4.00-4.15pm, CR	
Jessica Cecil	UMelb	Periodontal-Pathogen OMVs: immune-stimulants, virulence and risk factors for Chronic Periodontitis.	Poster	Senior, Basic (Mon)	Mon 12.20pm, CR	CSB08
Nicholas Chandler	UOtago	Vision: a study of clinical dental teachers	Poster	General (Tue)		GP03
Joanne Jung Eun Choi	UOtago	Intraoral pH and Temperature During Sleep	Poster	Senior, Clin/Preclin (Mon)	Mon 11.20am, CR	CSC03
Sofia Christofis	UAdel	Inequalities in tooth loss distribution: a time-trend analysis in Australia	Oral	S1: BE&HSR 1 - EE&I	Mon 11.45am-12.00pm, AUD	
Dawn Coates	UOtago	The Effects of Zoledronic Acid on VEGF and its Receptors	Oral	S5: Oral Medicine and Pathology 2	Tue 12.00-12.15pm, AUD	
Gemma Cotton	UOtago	Antimicrobial activity of silver nanocomposite against oral micro-organisms	Poster	Senior, Basic (Mon)	Mon 2.20pm, CR	CSB09
Leonard Crocombe	UTas	Dental care in small remote towns in Queensland	Oral	S1: BE&HSR 1 - EE&I	Mon 12.00-12.15pm, AUD	
Octavian Detenamo	FNU	The periodontal health status of students in a school for the hearing impaired in Suva, Fiji	Poster	General (Tue)		GP04
Anh Diep	UAdel	Three-dimensional high-resolution surface texture analysis of early enamel erosion	Poster	Junior (Mon)	Mon 11.10am, GAL	CJ02
Angela Durey	UWA	Improving Aboriginal Oral Health: A Qualitative Study On Aboriginal Health Workers' Perspectives In Perth, WA	Oral	S3: BE&HSR 3 - QoL & Workforce Research	Mon 3.30-3.45pm, AUD	
Mohamed El-Kishawi	UAdel	Learning Motor Skills In Dentistry: Comparing Different Approaches	Poster	Senior, Clin/Preclin (Mon)	Mon 11.30am, CR	CSC04
Camile Farah	UWA	Personalized Patient Care in Oral Oncology	Oral	S4: Oral Med & Path 1 - Oral Cancer Research	Tue 9.45-10.15am, AUD	
Mercedes Fernandez y Mostajo	ACTA	A multispecies subgingival biofilm model from periodontitis and peri-implantitis patients	Oral	S7: Oral Microbiology & Probiotics 2	Tue 3.45-4.00pm, AUD	
Andrew Flatau	CSU	Identifying Threshold Learning Outcomes to shape undergraduate dental curricula	Oral	S14: Best Practices in Clinical Teaching	Wed 10.15-10.30am, CR	
Mele Foliaki	FNU	Dentition status & treatment needs of Down's syndrome individuals in Nuku'alofa	Oral	S13: BE&HSR 4	Wed 12.30-12.45pm, AUD	
Lara Friedlander	UOtago	Vital pulp therapy; When, How, Why? - A NZ PBRN study	Poster	General (Tue)		GP05
Karla Gambetta-Tessini	UMelb	Validation of Quantitative Light-induced Fluorescence-Digital (QLF-D) for quantifying hypomineralised lesions	Poster	Senior, Clin/Preclin (Mon)	Mon 11.40am, CR	CSC05
Ratu Gavidu	FNU	Oral cancer amongst Pacific Islanders in New Zealand from 2000-2010	Oral	S5: Oral Med & Path 2	Tue 11.30-11.45am, AUD	
Danyon Graham	UOtago	The molecular basis of triazole inhibition of an antifungal target	Poster	Junior (Mon)	Mon 11.20am, GAL	CJ03
William Ha	UQ	Methodologies for measuring the setting times of Mineral Trioxide Aggregate and Portland Cement products used in dentistry	Poster	Senior, Clin/Preclin (Mon)	Mon 12.00pm, CR	CSC06
Dandara Haag	UAdel	Tooth loss and general quality of life: a population-based study	Oral	S3: BE&HSR 3 - QoL & Workforce Research	Mon 3.45-4.00pm, AUD	
Stephen Hamlet	GriffU	Microstructured titanium surfaces induce osteoblast paracrine signalling.	Poster	General (Tue)		GP06

PRESENTER	INST	PRESENTATION TITLE	TYPE	SESSION	TIME	ID #
Suzanne Hanlin	UOtago	The understanding of Vital Pulp Therapy in a Dental Faculty.	Poster	General (Tue)		GP07
Kamal Hanna	UAdel	Evaluating impacts of third molars experience on QoL using Twitter	Oral	S2: BE&HSR 2 - QoL	Mon 2.30-2.45pm, AUD	
Satoru Haresaku	Fukuoka DC	Evaluation of a web-based oral health education program at workplace developed with health professionals' feedback: a pilot study	Poster	General (Tue)		GP08
Ninuk Hariyani	UAdel	Root Caries Experience among Australians Adults	Oral	S3: BE&HSR 3 - QoL & Workforce Research	Mon 4.15-4.30pm, AUD	
Yan He	JCU	Bending affects surface and mechanical properties of Stainless-Steel wire	Poster	Senior, Clin/Preclin (Mon)	Mon 12.10pm, CR	CSC07
James Heimuli	FNU	Periodontal treatment needs of Down syndrome individuals attending two specialized institutions in Nuku'alofa, Tonga.	Poster	Junior (Mon)	Mon 11.30am, GAL	CJ04
Nicholas Heng	UOtago	Genome sequence of Streptococcus salivarius NCTC 8618 (ATCC 7073T)	Oral	S7: Oral Microbiology & Probiotics 2	Tue 4.45-5.00pm, AUD	
Ryo Hikita	Aichi Gak U	Experimental study on metal artifacts around dental implants	Poster	General (Tue)		GP09
Saeed Idrees	Kyoto U	Rabbit TMJ osteochondral defect regeneration using TMJ synovial fluid MSCs	Oral	S15: Biomechanics & Tissue Engineering	Wed 12.00-12.15pm, CR	
Ghassan Idris	UOtago	Efficacy of a Mandibular Advancement Appliance on Paediatric Sleep Disordered Breathing: a preliminary report.	Oral	S10: Craniofacial Biology 1	Tue 2.45-3.00pm, CR	
Kyoko Inamoto	Aichi Gak U	Prefrontal cortical hemodynamic response associated with pain in the gingiva	Poster	General (Tue)		GP10
Saso Ivanovski	GriffU	Histomorphometric Outcomes of Periodontal Regeneration with Multiphasic Scaffold in Sheep	Oral	S5: Oral Med & Path 2	Tue 12.15-12.30pm, AUD	
David Joo	UQ	Surface Interface Optimisation of Elastomeric Impression Materials	Poster	Senior, Clin/Preclin (Mon)	Mon 12.20pm, CR	CSC08
Dominic Keuskamp	UAdel	Prioritising public dental care improves self-rated health outcomes	Oral	S1: BE&HSR 1 - EE&I	Mon 11.30-11.45am, AUD	
Shahrukh Khan	UMalaya	Risk indicators of Chronic Periodontitis in Community Dwelling Elderly Malaysians	Oral	S3: BE&HSR 3 - QoL & Workforce Research	Mon 4.00-4.15pm, AUD	
Temalesi King	FNU	Is the Bula Smile important in marketing Eco-tourism in Fiji?	Oral	S13: BE&HSR 4	Wed 12.15-12.30pm, AUD	
Yoshitaka Kise	Aichi-Gak U	Salivary gland fat fraction estimated with a new MRI method	Poster	General (Tue)		GP11
Estie Kruger	UWA	The inverse care law: permanent conundrum for dental public health?	Oral	S1: BE&HSR 1 - EE&I	Mon 11.00-11.30am, AUD	
Sanjeewa Kularatna	GriffU	Measuring quality of life outcomes in children with dental caries for use in economic evaluations	Oral	S3: BE&HSR 3 - QoL & Workforce Research	Mon 4.45-5.00pm, AUD	
Reginald Kumar	FNU	Visitor Perceptions of the "Bula Smile" in the Suva Area, Fiji - A Pilot Study	Oral	S13: BE&HSR 4	Wed 12.00-12.15pm, AUD	
Felicity Lam	UAdel	The effects of the Y chromosome and intrauterine male hormones on human tooth size and shape	Poster	Junior (Mon)	Mon 11.40am, GAL	CJ05
Joanne Lee	UOtago	Extracellular cysteines of Candida albicans Cdr1p affect its efflux-pump function	Poster	Junior (Mon)	Mon 12.10pm, GAL	CJ07
Tony Lin	UOtago	Crown Preparation Parameters Produced by New Zealand Dental Students	Poster	Junior (Mon)	Mon 12.00pm, GAL	CJ06
James Liu	JCU	The potential of increased HIV education to change attitudes of JCU dental students towards patients with Human Immunodeficiency Virus (HIV)	Poster	Junior (Mon)	Mon 4.20pm, GAL	CJ18
Carolina Loch	UOtago	Ultrastructure and properties of teeth treated using the Hall Technique	Poster	General (Tue)		GP13
Bushra Malik	USyd	Recording of motor units during experimental muscle pain in masseter	Poster	Senior, Clin/Preclin (Mon)	Mon 2.20pm, CR	CSC09
Victor Matsubara	UQ	Probiotics Alter Dectin-1-expression and Cytokines-profile in Macrophages Challenged with Candida	Poster	Senior, Basic (Mon)	Mon 2.30pm, CR	CSB10

PRESENTER	INST	PRESENTATION TITLE	TYPE	SESSION	TIME	ID #
Konstantinos Michalakis	Aristotle U of Thessal	The influence of bone's elasticity on the apical migration of a natural tooth connected to an osseointegrated implant with a non-rigid attachment: A 3D Finite Element Analysis	Oral	Keynote presentation	Wed 9.00-9.45am, AUD	
Trudy Milne	UOtago	DNA methylation status of VEGF-A, HIF-1a and BMP-2 in gingival tissue of smokers.	Poster	General (Tue)		GP14
Colleen Murray	UOtago	Eyesight: a study of dental students during their clinical training	Poster	General (Tue)		GP15
Hina Narayan	UOtago	Effect of cigarette smoke on oral cells	Oral	S5: Oral Med & Path 2	Tue 11.00am-11.15am, AUD	
Narmin Nasr	UAdel	Provision of oral healthcare to cancer patients in Australia	Oral	S5: Oral Med & Path 2	Tue 11.45am-12.00pm, AUD	
Chaturi Neboda	UWA	Quality of life changes in pre-school children who underwent treatment for traumatic dental injuries under general anaesthesia.	Poster	Senior, Clin/Preclin (Mon)	Mon 2.30pm, CR	CSC10
Muhammad Niazi	UOtago	Percutaneous-exposure-incidents At A Dental Faculty: A Review Of Practice	Poster	Junior (Mon)	Mon 12.20pm, GAL	CJ08
Nushrat Nisha	FNU	Practice, Availability & Knowledge of Oral Hygiene Aides among Health Care Professionals of St Giles Hospital, Fiji	Poster	General (Tue)		GP16
Norhasnida Nordin	UOtago	Understanding responses to Likert options used in P-CPQ-16 and FIS-8	Poster	General (Tue)		GP17
Orit Oettinger-Barak	UMelb	Accuracy of dental implant positioning as achieved in practice	Oral	S15: Biomechanics & Tissue Engineering	Wed 11.30-11.45am, CR	
Evshen Okan	USyd	Oral Health Promotion In Lithgow Aged Care Facilities.	Poster	Junior (Mon)	Mon 2.20pm, GAL	CJ09
Hweizse (Jillian) Ong	UMelb	Effects of Azithromycin on Red Complex Polymicrobial Biofilms	Poster	Senior, Basic (Mon)	Mon 2.40pm, CR	CSB11
Manjara Packianathan	UAdel	Oral Features of Crouzon and Pfeiffer Syndromes	Oral	S11: Craniofacial Biol 2	Tue 4.15-4.30pm, CR	
Sindhuja Parthasarathy	UMelb	The effect of Smokefree Smiles training on oral health workers	Poster	Junior (Mon)	Mon 2.30pm, GAL	CJ10
Kelsey Pateman	UQ	Finding support online: peer support in head and neck cancer	Poster	Senior, Clin/Preclin (Mon)	Mon 2.40pm, CR	CSC11
Geraldine Pellie	FNU	Perceived dental needs and normative dental needs of hearing impaired adults in San Isidro Disability Center, West Guadalcanal, Honiara, Solomon Islands	Poster	Junior (Mon)	Mon 4.00pm, GAL	CJ16
Nathan Phung	UMelb	Periodontal Disease and Women's health: Awareness and Attitudes of Clinicians	Poster	Junior (Mon)	Mon 2.40pm, GAL	CJ11
Archana Pradhan	SA Dent Serv	Dental health and body mass index among Special Olympics Athletes	Oral	S2: BE&HSR 2 - QoL	Mon 2.45-3.00pm, AUD	
Jie Qin	USyd	The Effect Of Concentrated Growth Factor On Nerve Regeneration	Poster	Senior, Basic (Mon)	Mon 2.50pm, CR	CSB12
Alessandro Quaranta	UOtago	Extraction socket healing in humans after ridge preservation techniques: short-term analysis of remodeling pattern comparing two types of xenografts	Oral	S15: Biomechanics & Tissue Engineering	Wed 11.45am-12.00pm, CR	
Sarah Raphael	USyd	Tooth Mousse® for dental caries - clinical evidence. A systematic review.	Oral	S7: Oral Microbiology & Probiotics 2	Tue 4.15-4.30pm, AUD	
Karla Rovaris	UNICAMP	Human bone segmentation methods comparison using MicroCT images	Poster	General (Tue)		GP19
Atieh Sadr	CSU	Self-assessment for a life-long learner	Oral	S14: Best Practices in Clinical Teaching	Wed 10.00-10.15am, CR	
Syarida Safii	UOtago	Antimicrobial effect of medical-grade manuka honey against oral bacteria in vitro	Poster	Senior, Basic (Mon)	Mon 3.30pm, CR	CSB13
Vahid Sakhaei Manesh	JCU	A comparison of anesthetic efficacy of combined local anesthetic and ketamine in patients with irreversible pulpitis in the posterior mandibular teeth: a clinical trial.	Poster	Senior, Clin/Preclin (Mon)	Mon 2.50pm, CR	CSC12
Shigemitsu Sakuma	Aichi Gak U	Time-dependent changes in prefrontal cortex activity during tooth clenching	Poster	General (Tue)		GP20

PRESENTER	INST	PRESENTATION TITLE	TYPE	SESSION	TIME	ID #
Zahra Sarabadani	Shahed U	Osteogenic Differentiation of Rabbit Adipose- Derived Stem Cells: A histomorphometry study	Oral	S15: Biomechanics & Tissue Engineering	Wed 12.15-12.30pm, CR	
Michael Schenkel	GriffU	Bone healing stimulated by low-intensity pulsed ultrasound (LIPUS) in critical-sized bone defects in rats.	Poster	Junior (Mon)	Mon 2.50pm, GAL	CJ12
Helena Schuch	UAdel	Longitudinal effects of socioeconomic status on periodontitis: a systematic review	Oral	S13: BE&HSR 4	Wed 11.45am-12.00pm, AUD	
Donald Schwass	UOtago	Preventing biofilm formation by exposure of oral bacteria to silver nanoparticles	Poster	General (Tue)		GP21
Antonia Scott	USyd	Panoramic Radiology. New method of patient instruction reduces palato-glossal airspace	Poster	Senior, Clin/Preclin (Mon)	Mon 3.30pm, CR	CSC13
Benedict Seo	UOtago	Unfolded protein response gene expression in oral squamous cell carcinoma	Oral	S4: Oral Med & Path 1 - Oral Cancer Research	Tue 10.15-10.30am, AUD	
Ajay Sharma	UOtago	Effect of anodized titanium-zirconium implants on osseointegration - a sheep study	Poster	Senior, Basic (Mon)	Mon 3.40pm, CR	CSB14
Chakrabhavi G D Sharma	GriffU	Proangiogenic therapy as a treatment modality in the management of BRONJ	Poster	Senior, Clin/Preclin (Mon)	Mon 3.40pm, CR	CSC14
Allauddin Siddiqi	UOtago	Histomorphometric analysis of zirconia implants in the jaw of sheep	Poster	Senior, Basic (Mon)	Mon 3.50pm, CR	CSB15
Mihiri Silva	UMelb	Aetiology of Molar Incisor Hypomineralisation and Hypomineralised Second Primary Molars	Poster	Senior, Clin/Preclin (Mon)	Mon 3.50pm, CR	CSC15
Amelita Simpson	USyd	Survey of digital panoramic radiographs: quality assessment, faults and pathology	Poster	General (Tue)		GP22
Ankur Singh	UAdel	Theories on social inequalities and oral health: a scoping review	Oral	S13: BE&HSR 4	Wed 11.30-11.45am, AUD	
Linda Slack-Smith	UWA	Dental experiences of providing dental care to mental health consumers	Oral	S13: BE&HSR 4	Wed 11.15-11.30am, AUD	
Patcharawan Srisilapanan	Chieng Mai U	Efficacy and time kill assay of 0.05% cetylpyridinium chloride mouth rinse	Poster	General (Tue)		GP23
Margaret Stacey	UMelb	Community Pharmacists' Knowledge Regarding Dry Mouth	Poster	General (Tue)		GP24
Mark Storrs	GriffU	Evaluating Team-based Inter-professional Clinical Education in an Australian Dental School	Oral	S14: Best Practices in Clinical Teaching	Wed 10.30-10.45am, CR	
Sepehr Tabatabaee	UQ	Effects of Tooth Mousse Plus on Dental Plaque During Orthodontics	Poster	General (Tue)		GP25
Jyothi Tadakamadla	GriffU	Qualitative analysis of the impact of Oral Potentially Malignant Disorders on daily life activities	Oral	S5: Oral Med & Path 2	Tue 11.15-11.30am, AUD	
Santosh Tadakamadla	GriffU	Is Body Mass Index associated with dental caries? Findings from a sample of Indian school children	Oral	S7: Oral Microbiology & Probiotics 2	Tue 4.30-4.45pm, AUD	
John Tagg	Otago U	Streptococcus salivarius probiotic solutions for microbial misdemeanors in the human oral cavity	Oral	S6: Oral Microbiology & Probiotics 1	Tue 2.15-2.45pm, AUD	
Kenji Takada	NUSing	Modelling oral physiology for clinical diagnostics	Oral	S10: Craniofacial Biol 1	Tue 2.15-2.45pm, CR	
Rachael Taloni	FNU	Periodontal Status of the Residents of San Isidro Care Center (Auriligo) Guadalcanal Province, Solomon Islands	Poster	Junior (Mon)	Mon 4.10pm, GAL	CJ17
Joji Tamaoka	Hyogo Coll of Med	Effect of TGF- β 1 on osteoclast precursors in the bone microenvironment	Poster	General (Tue)		GP27
Helen Tane	CSU	Health promoting role of the oral health therapist	Oral	S1: BE&HSR 1 - EE&I	Mon 12.15-12.30pm, AUD	
Janine Tiu	UOtago	Experimental and numerical analysis of convergence angles in crown preparations	Poster	Senior, Clin/Preclin (Mon)	Mon 4.00pm, CR	CSC16
Carol Tran	UQ	Influence of a tablet-based skills trainer on preclinical restorative skills	Oral	S14: Best Practices in Clinical Teaching	Wed 9.45-10.00am, CR	
Julie Tran	USyd	Oral Health Education in a Justice Health Facility.	Poster	Junior (Mon)	Mon 3.30pm, GAL	CJ13
Svante Twetman	UCopenhagen	Probiotics for oral health: facts vs. fiction	Oral	Keynote presentation	Tue 1.30-2.15pm, AUD	
Venina Vokitia	FNU	Dental treatment need of hearing impaired students attending Gospel school of the deaf Suva, Fiji.	Poster	Junior (Mon)	Mon 3.40pm, GAL	CJ14

PRESENTER	INST	PRESENTATION TITLE	TYPE	SESSION	TIME	ID #
John Neil Waddell	UOtago	Effects of abutment screw torque on peri-implant bone strain	Poster	General (Tue)		GP28
Yi Wang	UQ	Inhibition of adhesion of oral bacteria to immortalized human gingival fibroblasts (HGF-1) by tea extracts	Poster	Senior, Basic (Mon)	Mon 4.00pm, CR	CSB16
Susan Wong	UWA	An evaluation of the change in quality of life of children after dental extraction under general anaesthesia.	Poster	Senior, Clin/Preclin (Mon)	Mon 4.10pm, CR	CSC17
Benjamin Wu	UCLA	Biomimetic strategies for tissue regeneration	Oral	Colgate Eminent Lecturer Presentation	Mon 9.30-10.30am, AUD	
Huixu Xie	JCU	A novel scaffold containing calcium polyphosphate and silk fibroin for bone tissue engineering	Poster	Senior, Basic (Mon)	Mon 4.10pm, CR	CSB17
Joyce (Chuan-Chia) Yu	UOtago	Effectiveness of dental students' crown preparations using preparation assessment software	Poster	Junior (Mon)	Mon 3.50pm, GAL	CJ15
Sobia Zafar	UOtago	Effect of Zoledronic Acid on Angiogenic Gene Expression by Osteoclasts	Poster	Senior, Basic (Mon)	Mon 4.20pm, CR	CSB18

List of delegates

This list includes all delegates who had registered for the conference as of 10 August, 2015. It does not include those delegates who requested their details be omitted from the Conference Programme on privacy grounds.

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