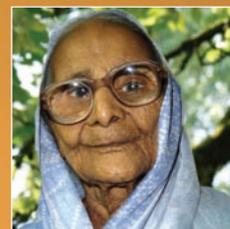


UBC DENTISTRY



Dignity and Quality of Life for a Frail Population
JANUARY 25, 2011



RESEARCH DAY 2011

Advancing oral health through
outstanding education, research,
and community service.

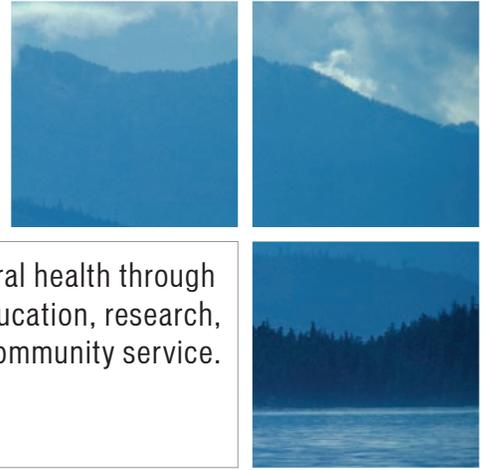


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MESSAGE FROM THE DEAN

*Welcome to the Fourth Annual Research Day
at the UBC Faculty of Dentistry.*



All of our Research Days have presented scholarly achievements of the Faculty of Dentistry and applications of these new findings to improve patient care outcomes. The theme for this Research Day, “Dignity and Quality of Life for a Frail Population”, is particularly important at this time. We hope you will learn how research conducted at UBC is being translated into new approaches for managing geriatric patients.

The provision of oral healthcare in senior adults has gone through dramatic changes in just the past 40 years. In the 1960s, an individual who reached 60 years of age was likely edentulous, wearing complete dentures, and thought it was normal to lose all of their teeth. In 2010, a 60 year-old patient likely has nearly all of their teeth and does not ever expect to become edentulous. The lifespan of a tooth in the mouth has changed such that we are now encountering dental disease in an aging population that has never been previously observed. The fact that people are living longer with their teeth represents a new challenge for oral health professionals. In the older population, physical problems can prevent the practice of routine oral hygiene procedures and, as individuals begin to show signs of dementia, the priority for oral hygiene can become quite low for all of the caregivers involved. Consequently, the dentition suffers in many ways and has a negative impact on quality of life.

The ELDERS (Elders’ Link with Dental Education, Research and Service) group at the UBC Faculty of Dentistry has taken a lead role internationally in examining the oral health impact on senior adults. The faculty members who have achieved these new insights will be sharing them with all attendees. In addition, we will hear the voices of dentists who have treated seniors and in some cases become senior citizens themselves. A comparison of the research findings with the personal experiences of these individuals provides a unique format for this Research Day.

I hope you enjoy this program and appreciate that this research is critically important yet quite different in scope and application than the research presented in the first three Research Days. The next 40 years will see amazing changes in the nature of oral healthcare as a considerable portion of the population reaches an advanced age. The UBC Faculty of Dentistry is a recognized leader in this field and will help to guide oral health practice for our seniors.

Thank you for your participation.

A handwritten signature in black ink that reads "Charles Shuler". The signature is fluid and cursive.

Charles F. Shuler, DMD, PhD
Professor and Dean, UBC Faculty of Dentistry

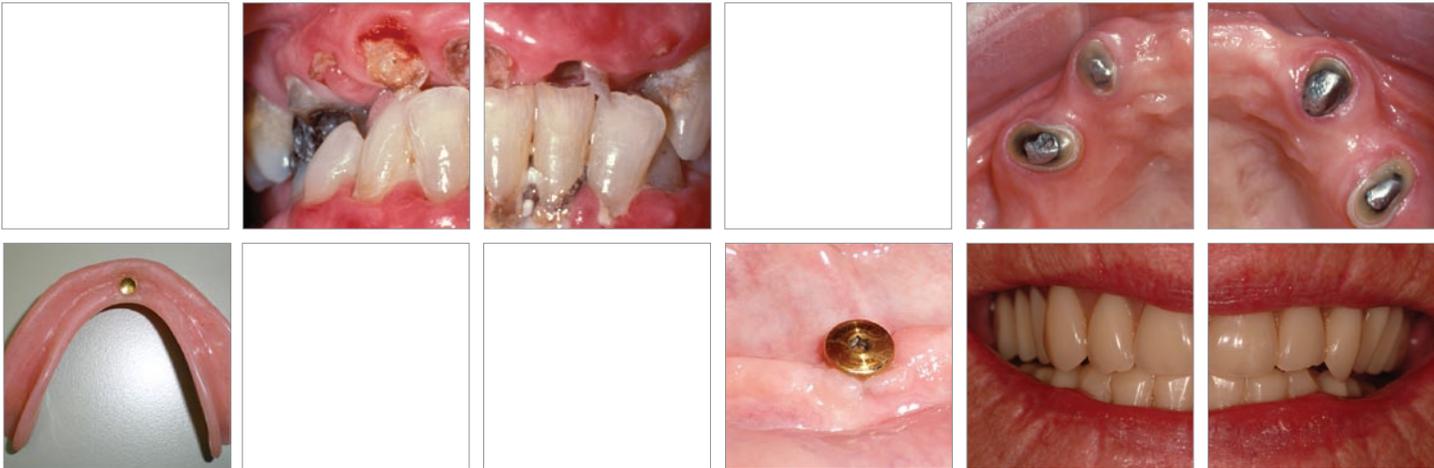
<h1>DENTAL GERIATRICS CASE</h1>					

“Oh my goodness, Mother, your mouth smells and you look awful!” – and so the conversation – or rather the trauma – began. Jennifer lives in Winnipeg, and Louise, her mother, has been living in a nursing home in Richmond for the last six months since she had a debilitating stroke that left her dizzy periodically and without control of her right arm or the ability to move around without a walker. Louise was frail, so Jen arranged for her to move into a nursing home and helped her to settle – all seemed as well as could be expected. Now on returning for the first time to see her mother, she was shocked. “Why has my mother not seen a dentist?” she asked the Director of Nursing. “Doesn’t anyone help my mother to clean her teeth?” “Yes” was the reply to the second question but “No” to the dentist! “Please call a dentist,” she ordered. This was easier said than done, and now Louise was distressed about her teeth, which she hadn’t noticed previously. Several calls to local dentists finally found the UBC Geriatric Dentistry Program. Eventually a dentist arrived and then a dental hygienist came to see her mother. Subsequently, with more careful attention from the nursing staff, the healthcare team managed to retain only four maxillary teeth as overdenture abutments. All they could achieve in the mandible was a single implant with a magnet-retained overdenture. Nonetheless, it was a compromise that Louise accepted in her unflinching optimism, but Jennifer felt only shame that she had allowed the system to fail her mother. [Case courtesy of Dr. Michael MacEntee]

Case Learning Objectives:

At the end of the day, participants are expected to be able to:

- Understand the significance of the social environment on oral healthcare;
- Anticipate relationships between general health and oral health in frail people;
- Explain the role of dental personnel on multidisciplinary teams in long-term care (LTC) facilities;
- Identify and manage the most likely cause of caries, periodontitis and gingivitis in LTC; and
- Develop and explain the benefits and limitations associated with multiple options for treating and managing rampant caries, periodontitis and tooth loss for frail people.



UBC Dentistry Research Day 2011

Dignity and Quality of Life for a Frail Population

Tuesday, January 25, 2010 • 8:00 am – 3:00 pm
 UBC Student Union Building Ballroom

8:00 – 8:40	REGISTRATION & CONTINENTAL BREAKFAST
8:40 – 8:50	WELCOME Dr. Charles Shuler, Professor and Dean
8:50 – 9:00	INTRODUCTION & OVERVIEW OF THE DAY Dr. Edward Putnins, Professor and Associate Dean of Research & Graduate/Postgraduate Studies
9:00 – 9:25	MEANING OF THE DAY Dr. George Beagrie, Dean Emeritus, UBC Faculty of Dentistry
9:30 – 9:55	PUTTING REALITY INTO DENTAL GERIATRICS RESEARCH Dr. Michael MacEntee, Professor, Division of Prosthodontics & Dental Geriatrics, Department of Oral Health Sciences “What have been the challenges in developing and implementing an oral health program for the frail?”
9:55 – 10:25	FRAILTY AS AN ORAL HEALTH CHALLENGE Dr. Lynn Beattie, Professor Emerita, Division of Geriatric Medicine, UBC Department of Medicine “What are the biological and physiological changes as we age?”
10:30 – 10:55	COFFEE BREAK
11:00 – 11:25	THE PATIENT’S VOICE Dr. Ross Bryant, Assistant Professor, Division of Prosthodontics & Dental Geriatrics, Department of Oral Health Sciences “What are the patient’s thoughts on tooth loss and replacement?”
11:30 – 11:45	GERIATRICS IN DENTAL EDUCATION Dr. Mario Brondani, Assistant Professor, Division of Prosthodontics & Dental Geriatrics, Department of Oral Health Sciences “What curriculum changes are needed to ensure that the next generation of dentists is competent to manage the frail patient?”
11:45 – 12:55	RESEARCH POSTER AWARDS PRESENTATION (UNDERGRADUATE & GRADUATE STUDENTS) LUNCH (BOX LUNCH PROVIDED) & RESEARCH POSTER VIEWING Posters by undergraduate students, graduate students, post-doctoral fellows, research associates, visiting scientists, and faculty members.
1:00 – 1:25	REACHING OUT TO FRAIL ELDERS Dr. Chris Wyatt, Associate Professor and Chair, Division of Prosthodontics & Dental Geriatrics, Department of Oral Health Sciences “What must an oral health program deliver to care for the frail?”
1:30 – 2:45	THE FUTURE OF ORAL HEALTHCARE FOR FRAIL ELDERS (Presentation by Hamber Visiting Professor) Dr. Asuman Kiyak, Professor and Director of Institute on Aging, University of Washington “Is the oral health community ready, willing and able for the challenge?”
2:45 – 3:00	CASE WRAP-UP & DISCUSSION

UBC Dentistry Thanks the Following Research Day Sponsors:

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MESSAGE FROM THE ASSOCIATE DEAN OF RESEARCH



To all, thank you for attending the Fourth Annual UBC Dentistry Research Day.

Research Day 2011 is focused on the management and care of the frail elderly. This population is often forgotten and more effort is required to understand and address the unique needs of these patients. I personally experienced many challenges when I was a recent graduate undertaking a locum in an extended-care veterans' hospital. I still clearly remember some of my initial challenges. I had to review long lists of medications, I often had to work slower and curtail my enthusiasm to treat because the patient had enough for that appointment, and I had to learn the difference between a perfect dentition and a functional dentition. I do remember some of these challenges, but there are many positive powerful lessons and memories as well. When I did learn to evaluate long lists of medications, my transition to private practice was easier. I vividly remember the incredible life stories these patients shared while I was working and I remember when I understood that having 32 teeth is great but having less is also okay. In reality, each of these quiet individuals easily gave me as much as I hope I was able to provide to them.

During the day, we will have several presentations by numerous members of the Division of Prosthodontics & Dental Geriatrics. In addition, we are honoured to include presentations by Dr. Lynn Beattie, Professor Emeritus, Department of Geriatric Medicine, Faculty of Medicine, UBC and the keynote address, which will be delivered by

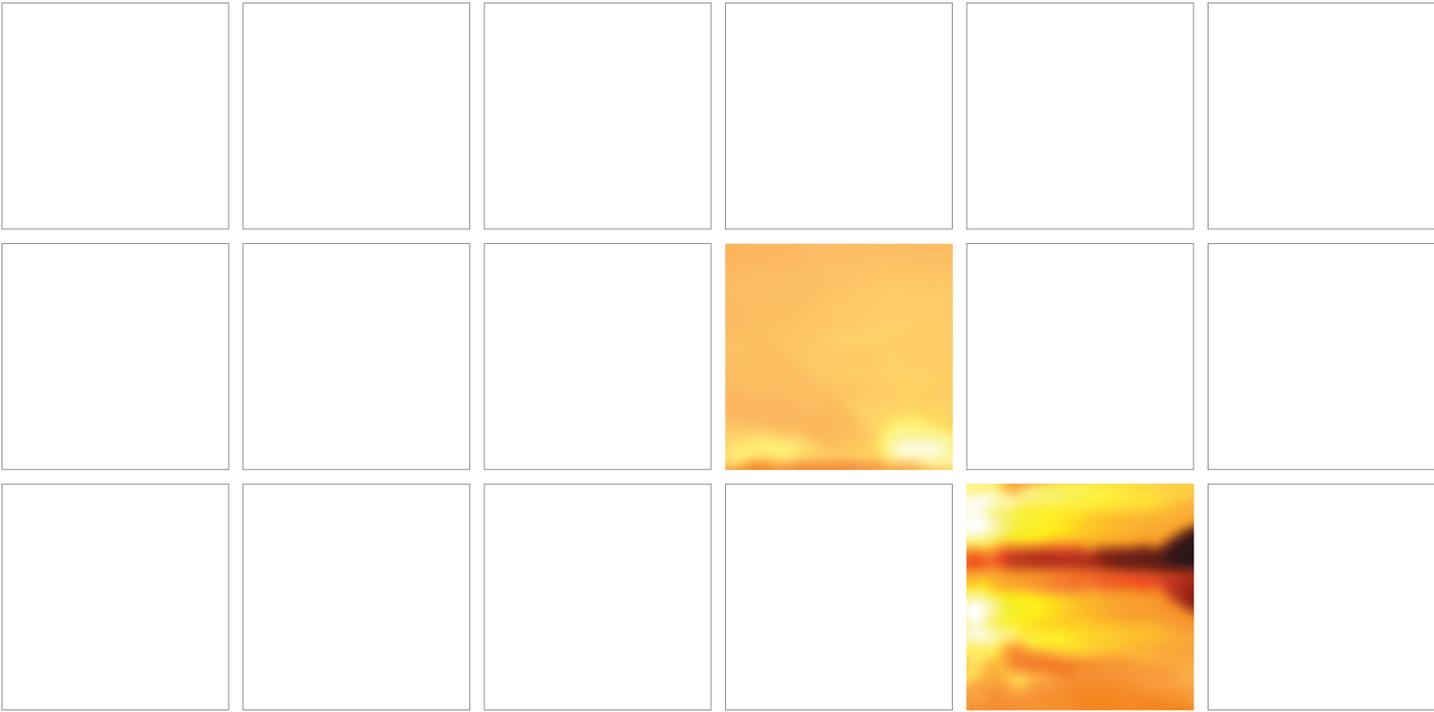
Dr. Asuman Kiyak, Professor and Director of the Institute of Aging at the University of Washington. Collectively, they will discuss the systemic and oral physiological changes that occur with aging, how to best educate future dental professionals, how to effectively manage the oral health needs of frail individuals, and then we will end with a look to the future. In addition, this is the first year that we have asked members of our dental community to reflect on the importance of this day and topic. Overall, it will be an exciting day.

In closing, I would like to express our appreciation to our outstanding speakers, our video commentators, our supporters, and all who have agreed to participate in Research Day 2011. Personally, I would also like to thank all of the members of this year's Research Day Organizing Committee (Clare Davies, Ingrid Ellis, Alison Kovacs, Michael MacEntee, Jane Merling, and Terry Wintonyk), who continue to work very hard to make this day a success.

Do enjoy Research Day 2011.

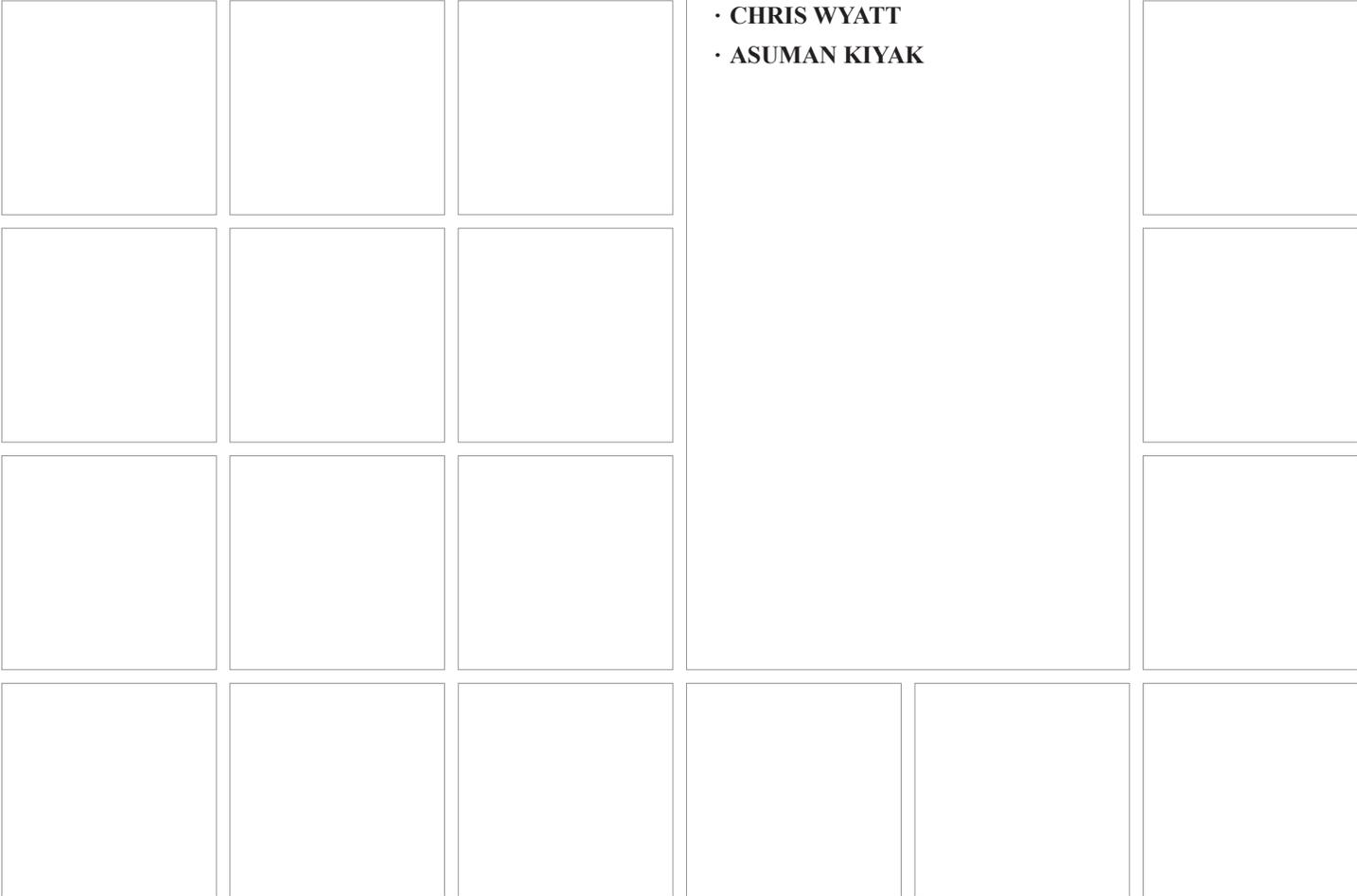


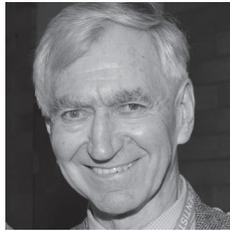
Edward E. Putnins, DMD, PhD, DipPerio
Professor and Associate Dean of Research
& Graduate/Postgraduate Studies



PRESENTERS
BIOGRAPHIES AND SYNOPSES

- **GEORGE BEAGRIE**
- **MICHAEL MACENTEE**
- **LYNN BEATTIE**
- **ROSS BRYANT**
- **MARIO BRONDANI**
- **CHRIS WYATT**
- **ASUMAN KIYAK**





GEORGE S. BEAGRIE, LDSRCS, FDSRCS, DDS, Dip Perio, FRCD(C), FICD, FACD

During his tenure as Dean of the UBC Faculty of Dentistry from 1978-1988, Dr. Beagrie's achievements included the establishment of the Hospital Dentistry Program, development of pre-clinical education in the Performance Simulation Laboratory, designation as a World Health Organization Collaborating Centre for the Use of Human Performance Dentistry, and creation of graduate PhD, combined DDS/MSc and Periodontics Specialty programs. His numerous additional appointments included President of the International Association for Dental Research, President of the Royal College of Dentists of Canada, and Examiner of the National Dental Examining Board of Canada.

MEANING OF THE DAY

The elderly and frail often suffer from eating difficulties while the poor and underprivileged lack food security. Eating is one of the major pleasures in life for all ages, but for these people it sometimes becomes the greatest challenge. Thus during this year's Research Day, entitled "Dignity and Quality of Life for a Frail Population", we concentrate on investigative methods and tools for assisting this community of individuals. The past century has seen human life expectancy almost doubled and increased numbers of people over 65 retaining their teeth has led to a more directed approach to the oral health needs of this older population. That Dentistry has a contribution to make in the quality of life of the elderly and frail is indisputable. Only with knowledge and understanding can come the necessary integration and relevance to meet the oral health needs of this society.



MICHAEL I. MacENTEE, PhD, LDS(I), Dip Prosth, FRCD(C)

Dr. Michael MacEntee, Professor of Prosthodontics & Dental Geriatrics, is Past President of the Association of Prosthodontists of Canada, the International College of Prosthodontists, and of the Royal College of Dentists of Canada. He recently received the Distinguished Scientist Award in "Geriatric Oral Research" from the International Association for Dental Research, and he is the senior editor of the book "Oral Healthcare and the Frail Elder: A Clinical Perspective" published by Wiley-Blackwell.

PUTTING REALITY INTO DENTAL GERIATRICS RESEARCH

The ELDERS (Elders' Link with Dental Education, Research and Service) group at UBC was established to provide administrative structure to the oral health-related needs of our aging population and to the educational needs of dentists and dental students within an overall context of gerontology and research. It is an interdisciplinary group with scholars from many faculties and schools at UBC. This presentation will present a brief history of the ELDERS group, explaining how research in dental geriatrics in this Faculty has evolved over 30 years to address a wide range of clinical problems including late elder caries, implants, oral healthcare in long-term care facilities, and dentistry for elderly immigrants.



B. LYNN BEATTIE, MD, FRCP
Professor Beattie is Professor Emerita and Past Head, Division of Geriatric Medicine, Department of Medicine, UBC, and Medical Director of the Clinic for Alzheimer's Disease and Related Disorders, UBC Hospital. Currently she is a co-leader of the BC Network for Aging Research. Her research interests and activities span a wide range of clinical problems in geriatrics, with a particular focus on treatment interventions that promote functional capacity and quality of life in persons with dementia, including working with families and health service providers.

FRAILTY AS AN ORAL HEALTH CHALLENGE

Frailty is a common syndrome, seen more often with increasing age. Older persons are often vulnerable and at a precarious risk for an imbalance in demands and capacity to cope, with impending decline as a result. Potential consequences include disability, falls, morbidity, hospitalization, and finally institutionalization. Evaluation domains include nutrition, mobility, activity, strength, endurance, cognition, and mood. Addressing frailty means evaluating assets and deficits and trying to maintain the balance on the asset side. Nutrition and oral health are one of the areas for potential concentration, along with activity and mood. There is increasing evidence that positive gains in multiple factors can maintain the asset balance even in frail older persons.



S. ROSS BRYANT, DDS, PhD, FRCD(C)
Dr. Ross Bryant is an Assistant Professor of Prosthodontics & Dental Geriatrics in the Department of Oral Health Sciences and a member of the ELDERS (Elders' Link with Dental Education, Research and Service) group at the UBC Faculty of Dentistry. He teaches implant dentistry and prosthodontics, and his research is on the biological and psychosocial impact of tooth loss and dental implant prostheses in older patients. Dr. Bryant treats patients with a focus on implant dentistry at the UBC Dentistry Specialty Clinic. He has been President of the BC Society of Prosthodontists, and the Dental Specialist Society of BC.

THE PATIENT'S VOICE

The patient interview helps qualitatively identify their problems and guides whether and how treatment might improve their quality of life. Quantitative assessments typically indicate relatively higher unmet needs. With frail elders, we sometimes struggle with our idealistic views on treatment, not only because of less predictable outcomes, but also because the patient's voice may be diminished by dependence or dementia. The challenge in geriatric dentistry is distinguishing the influence of patient expectations on the outcome of treatment. For example, frail elders with depleted dentitions may need more preventive and palliative care than surgical or prosthetic treatment. Elders with dentures can be very positive about their quality of life even without implant support. However, with advancing dementia, these individuals may be better suited to not using dentures.



MARIO BRONDANI, DDS, MSc, PhD *Dr. Mario Brondani received his dental degree from UFRGS in 1993. His MSc in Gerontology (PUCRS 2002) focused on oral health education in long-term care facilities while his PhD in Dental Sciences (UBC 2007) focused on models and measurements of oral health and quality of life in old age. He is currently an MPH candidate (UBC). As an Assistant Professor, Dr. Brondani has been teaching, researching, and providing services within the Canadian elderly population. He is interested in community services, curricular development, outreach activities, interprofessionalism, psychometrics, diversity, and oral cancer.*

GERIATRICS IN DENTAL EDUCATION

Despite the exponential growth of the elderly population worldwide, geriatric dental education has been a formal component of only a few dental schools' curricula. This presentation discusses the dental geriatrics component at the UBC Faculty of Dentistry, taking into consideration the status of the Canadian elderly population, the content of what should and could be taught, the need for extramural activities, the barriers and facilitators in fostering geriatric dental education, and the opportunities for education and research. It uses the Professionalism and Community Service (PACS) module as an example to encourage students to develop comprehensive knowledge and awareness of the needs and dynamics of the aging population in general while interacting with residents of long-term care facilities in particular.



CHRISTOPHER C.L. WYATT, BSc, DMD, Dip Prosth, MSc, FRCD(C) *Dr. Chris Wyatt is Associate Professor and Chair of the Division of Prosthodontics & Dental Geriatrics at the UBC Faculty of Dentistry. He graduated with a DMD degree from UBC in 1986, a Diploma in Prosthodontics in 1995, and an MSc in Dentistry in 1996 from the University of Toronto. Dr. Wyatt is a founding member of the ELDERS (Elder's Link with Dental Education, Research and Service) group, and the Director of the UBC Geriatric Dentistry Program. He is Past President of the Association of Prosthodontists of Canada and the BC Society of Prosthodontists, he sits on the Canadian Dental Association Committee on Clinical & Scientific Affairs, and chairs the Geriatric Dentistry Committee of the BC Dental Association.*

REACHING OUT TO FRAIL ELDERS

Numerous studies have documented very poor oral health and limited access to dental care among frail older adults residing in long-term care (LTC) facilities. In 1999, Providence Healthcare and the UBC Faculty of Dentistry partnered to implement a comprehensive dental program for 900 elderly LTC residents. The program was not only to provide much-needed service, but also opportunities for education and research. Starting in 2002, the program began delivering dental services; over the first year, 894 residents were seen for oral health assessments. A total of 58% of the residents were recommended for dental treatment, 30% accepted the recommendation, and 26% received treatment. Residents who received dental care showed a significant improvement in their oral health as measured at one and five years.

KEYNOTE ADDRESS



H. ASUMAN KIYAK, MA, PhD

Dr. Asuman Kiyak is Director of the Institute on Aging at the University of Washington, Director of the Geriatric Dentistry Program in the School of Dentistry, and a Professor in the Department of Oral & Maxillofacial Surgery. She is also an Adjunct Professor in the Departments of Psychology and Nutrition. She has been on the UW faculty since 1977, and has been Director of the Institute on Aging (IoA) since 1994.

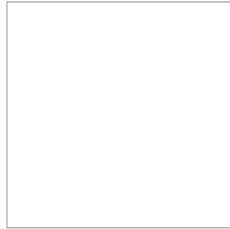
Dr. Kiyak has obtained research funding to study health disparities across ethnic and socioeconomic groups, barriers to health care, and to test new models of oral health promotion for special populations, particularly among older adults. She has also conducted research on older adults' acceptance and use of technology to enhance aging in place. Dr. Kiyak's studies of informed consent in clinical dental practice have led to a new understanding of the importance of dentist-patient communication prior to major dental procedures. Her activities in geriatric dentistry, gerontology, dental informed consent, orthodontics, and behavioral dentistry resulted in a Distinguished Scientist Award in "Behavioral Sciences" from the International Association for Dental Research in 2000, and a Distinguished Professorship at UCLA in 2003. She is a Fellow of the Gerontological Society of America.

Asuman Kiyak obtained her BA from the University of Michigan in 1972, an MA in 1974, and a PhD in Psychology from Wayne State University in 1977. She has published over 150 journal articles and book chapters, given numerous lectures at scientific, professional and community meetings, and is the author

(with Dr. Nancy Hooyman) of a well-known textbook on aging, "Social Gerontology: A Multidisciplinary Perspective" (Allyn & Bacon, 9th edition, 2010).

THE FUTURE OF ORAL HEALTHCARE FOR FRAIL ELDERS

The future of geriatric dentistry will be far different from its past! Not only will there be more elders in the population, but these older adults will represent a very different cohort than their parents and grandparents. They will be more educated and in many cases still working, more focused on esthetics and preventive care (in systemic as well as oral health), more aware of healthy aging, and interested in maintaining the teeth they have (i.e. far fewer will be edentulous but more will present with implants placed in their middle years). These "healthy elders" will demand more preventive, restorative, and esthetic services from the dentist. At the same time, however, there will be some elders who will experience dementia or other conditions that require more assistance and make it impossible for them to care for themselves. These elders, either in long-term care facilities or living with some help in their own homes, will present an ethical and healthcare challenge for the dental team. Issues of what dental services to provide, the impact of their systemic conditions on oral health, and how to manage these conditions, as well as the role of others (e.g. physicians, social workers, family caregivers) in caring for this increasingly diverse population, will provide an important new perspective to geriatric dentistry. This presentation will examine each of these challenges.



NORMAN C. FERGUSON, DMD



TERRY S. KLINE, BSc, DDS



SOPHIA LEUNG C.M., BS, MSW



WILLIAM J. ROSEBUSH, DMD



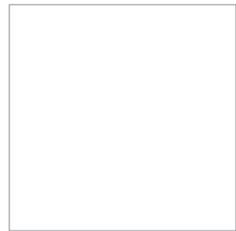
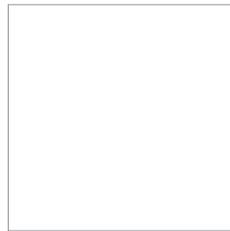
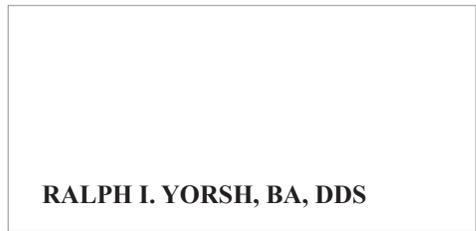
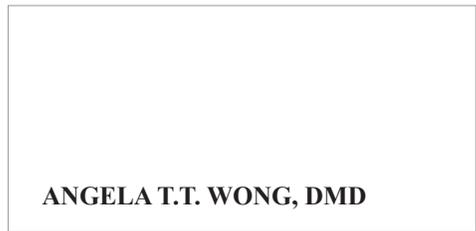
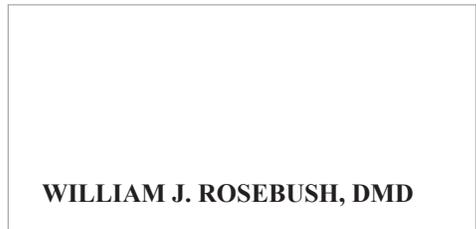
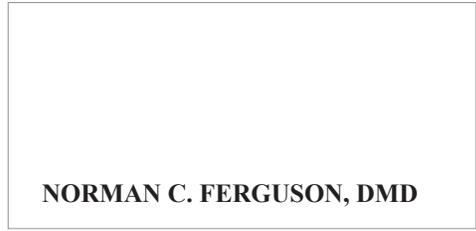
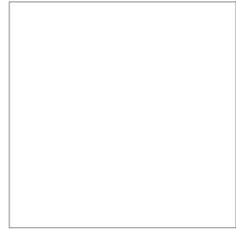
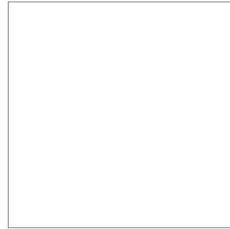
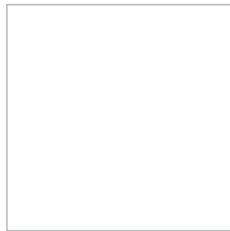
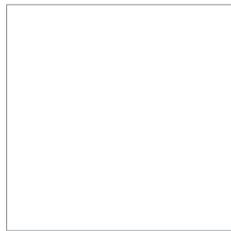
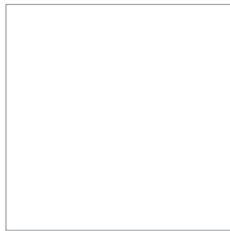
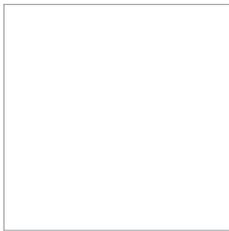
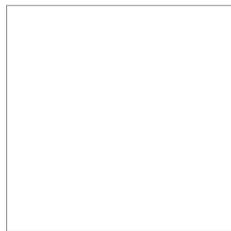
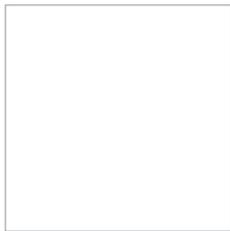
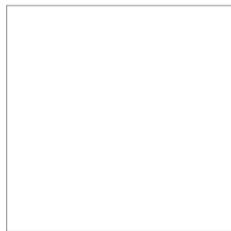
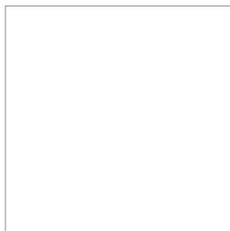
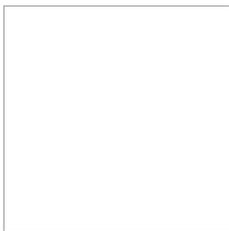
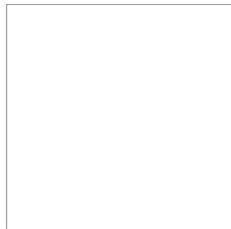
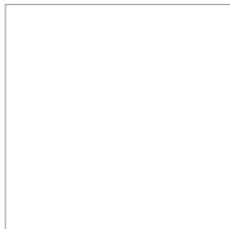
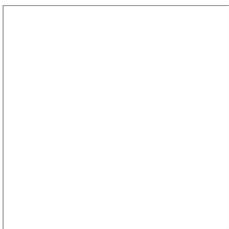
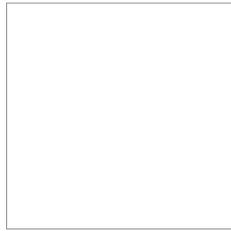
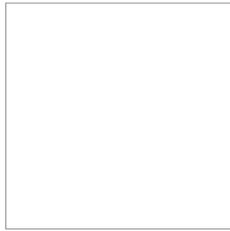
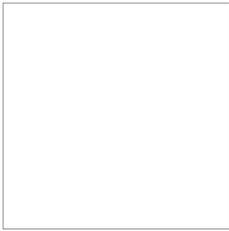
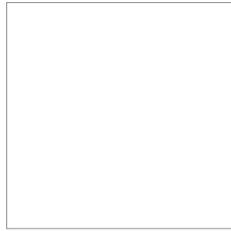
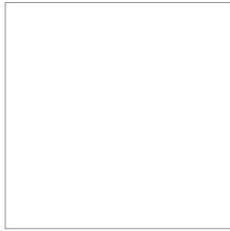
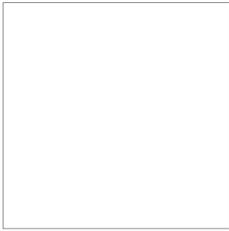
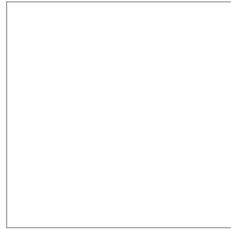
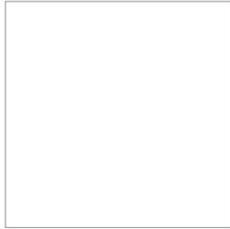
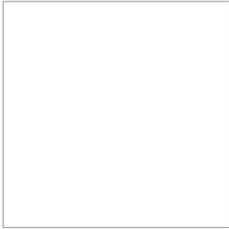
ANGELA T.T. WONG, DMD

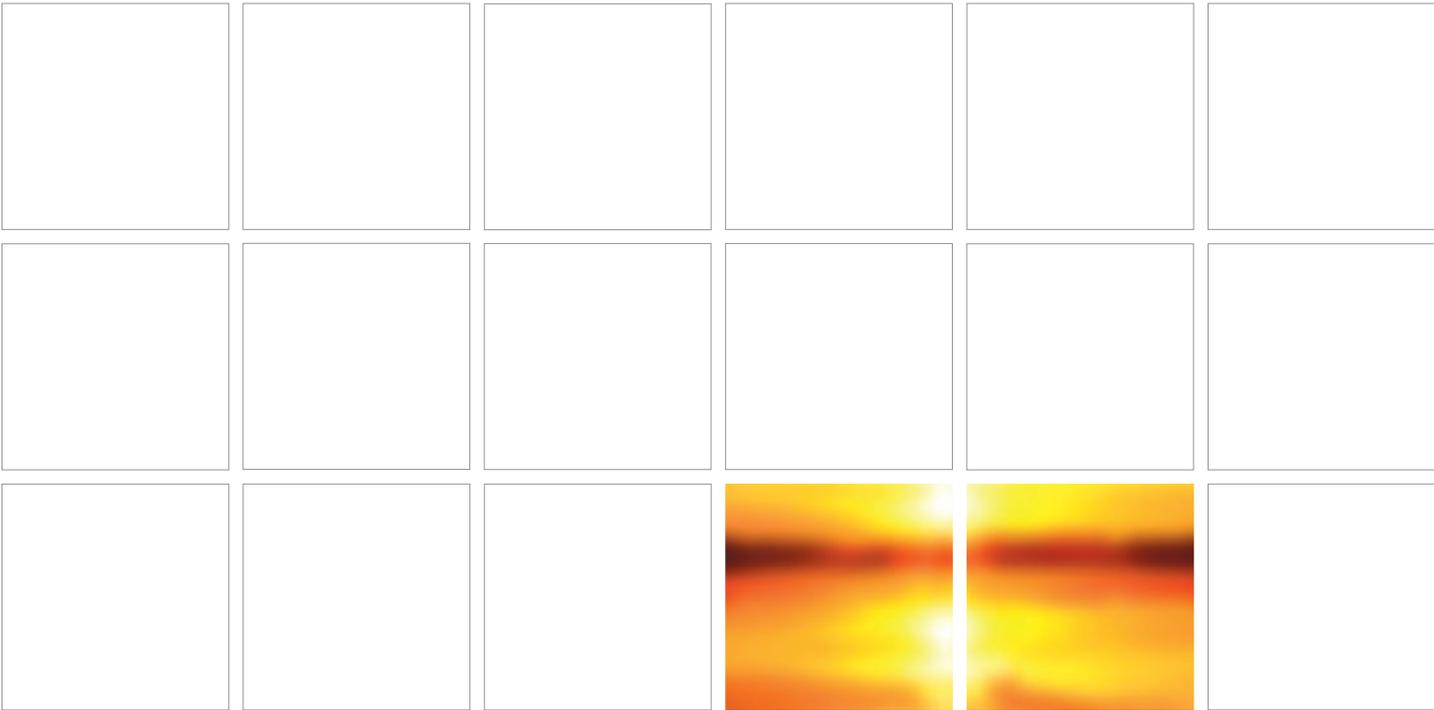


RALPH I. YORSH, BA, DDS



VIDEO CONTRIBUTORS





POSTER ABSTRACTS
Poster Competition Judges

- **DR. DIETER BRÖMME**
- **DR. S. ROSS BRYANT**
- **DR. JEFFREY COIL**
- **DR. LARI HÄKKINEN**
- **DR. CAROLINE NGUYEN**
- **DR. GETHIN OWEN**
- **DR. BENJAMIN PLISKA**
- **DR. N. DORIN RUSE**
- **DR. RAVINDRA SHAH (CHAIR)**
- **DR. DAVID SWEET**
- **DR. J. DOUGLAS WATERFIELD**
- **DR. LEWEI ZHANG**



- 1 Survey of Irrigation Protocols Used by Dentists in British Columbia**
Abtin H^{1*}, Haapasalo M¹, Aleksejūnienė J²
¹Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada (UBC); ²Department of Oral Health Sciences, Faculty of Dentistry, UBC
- 2 The Crystal Structures of Chondroitin and Dermatan Sulfate-Cathepsin K Complexes**
Aguda AH^{1*}, Du X², Nguyen NT², Brayer GD², Brömme D^{1,2}
¹Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada (UBC); ²Department of Biochemistry & Molecular Biology, Faculty of Medicine, UBC
- 3 Patient Experiences of Continuous Positive Airway Pressure and Oral Appliances**
Almeida F^{1*}, Lowe AA¹, Chen H¹, Ayas N², Marra C³, Lynd L³
¹Department of Oral Health Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada (UBC); ²Respiratory Division, Faculty of Medicine, UBC; ³Faculty of Pharmaceutical Sciences, UBC
- 4 A Culturally Sensitive Oral Cancer Prevention Program for South Asians**
Auluck A^{1,2*}, Hislop G¹, Bortorff J³, Zhang L^{1,2}, Rosin M^{1,4}
¹British Columbia Cancer Agency, Vancouver, Canada; ²Faculty of Dentistry, The University of British Columbia, Vancouver, Canada; ³Faculty of Health & Social Development, The University of British Columbia Okanagan, Kelowna, Canada; ⁴Department of Kinesiology, Simon Fraser University, Burnaby, Canada
- 5 Transforming Growth Factor Beta Signaling Modulators in Periodontal Disease**
Bains-Dahia S^{1*}, Gaudie J², Häkkinen L¹, Larjava H¹
¹Laboratory of Periodontal Biology, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada; ²Centre for Gene Therapeutics, McMaster University, Hamilton, Canada
- 6 Gene Expression Analysis of Macrophage Polarization by Surface Roughness**
Barth KA^{*}, Waterfield JD, Brunette DM
Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada
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Brownrigg DC^{*}, Diewert VM
Department of Oral Health Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada
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Butler GS^{*}, Overall CM
Department of Oral Biological & Medical Sciences, Faculty of Dentistry, Centre for Blood Research, The University of British Columbia, Vancouver, Canada
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Chen A^{*}, Samim F, Lim F, Zhang L, Poh CF
Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada
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Du X^{1*}, Chen N¹, Li C-M¹, Brömme D^{1,2}
¹Department of Biochemistry & Molecular Sciences, Faculty of Medicine, The University of British Columbia, Vancouver, Canada (UBC); ²Department of Oral Biological & Medical Sciences, Faculty of Dentistry, UBC

- 11 Misexpression of the RA Inactivating Enzyme CYP26A1 Inhibits Jaw Development**
Fan CY*, Richman JM
Department of Oral Health Sciences, Faculty of Dentistry, Life Sciences Institute, The University of British Columbia, Vancouver, Canada
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Garcha J*, Best L, Black N
Department of Oral Health Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada
- 13 Matrix Metalloproteinases in Scarless Wound Healing**
Giannelis G^{1*}, Wiebe C¹, Jiang G¹, Gallant-Behm C², Hart D³, Larjava H¹, Häkkinen L¹
¹Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada; ²Department of Molecular, Cellular & Developmental Biology, University of Colorado at Boulder, Boulder, Colorado, USA; ³Department of Surgery, McCaig Institute of Bone & Joint Health, The University of Calgary, Calgary, Canada
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Gorovenko MR*, Aleksejūnienė J, MacEntee MI, Wyatt CCL
Department of Oral Health Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada
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Gu Y*, Chen E, Zhu Y, Zhang L, Poh CF
Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada
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Brondani M, He S*
Department of Oral Health Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada
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Ho M*, Du X, Brömme D
Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada
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Holmes SN^{1*}, Buchtová M¹, Nimmagadda S¹, Trachtenberg AJ², Kuo WP², Richman JM¹
¹Department of Oral Health Sciences, Faculty of Dentistry, Life Sciences Institute, The University of British Columbia, Vancouver, Canada; ²Harvard Clinical & Translational Science Center, Boston, Massachusetts, USA
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Hosseini Farahabadi S*, Richman JM
Department of Oral Health Sciences, Faculty of Dentistry, Life Sciences Institute, The University of British Columbia, Vancouver, Canada
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Huang V*, Bryant SR, MacEntee MI, Walton JN
Division of Prosthodontics & Dental Geriatrics, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada

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Kanda P*, Chehroudi B, Ruse ND

Faculty of Dentistry, The University of British Columbia, Vancouver, Canada

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Kanji Z^{1*}, Boschma G², Imai P¹, Sunell S¹, Craig BJ¹

¹Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada (UBC); ²School of Nursing, UBC

23 Macrophage-Mediated Depletion of Hydrogen Peroxide in Cell Culture

Karastathis D*, Waterfield JD, Putnins EE, Brunette DM

Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada

24 Remote-Controlled Titania Nanotube Drug Delivery System

Kim JN^{1,2*}, Kim CY², Park HJ², Yoo JY², Oh SH³

¹Visiting Professor, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada; ²College of Dentistry, Wonkwang University, Iksan, Jeonbuk, Republic of Korea; ³Department of Dental Biomaterials, College of Dentistry, Wonkwang University, Iksan, Jeonbuk, Republic of Korea

25 The Effect of Microtubule Disassembly on Palatal Fusion

Kitase Y*, Shuler C

Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada

26 Prediction of Local Recurrence During Follow-Ups Using Fluorescence Visualization

Ko K*, Chen E, Laronde D, Williams PM, Poh CF

Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada

27 How the Turtle Makes its Palate without Palatal Shelves

Leung KJ*, Richman JM

Department of Oral Health Sciences, Faculty of Dentistry, Life Sciences Institute, The University of British Columbia, Vancouver, Canada

28 The Differences Among Age Groups of the Early-Staged Oral Cancers

Lubpairee T^{1,2*}, Zhang L^{1,2}, Rosin MP¹, Poh CF^{1,2}

¹BC Oral Cancer Prevention Program, BC Cancer Agency; ²Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada

29 Role of Small Leucine-Rich Proteoglycans in Wound Healing

Mah W*, Jiang G, Larjava H, Häkkinen L

Laboratory of Periodontal Biology, Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada

30 Critical Role for $\alpha v \beta 6$ Integrin in Enamel Biomineralization

Mohazab L^{1*}, Aurora S¹, Owen GRh¹, Ruse ND¹, Häkkinen L¹, McKee MD², Larjava H¹

¹Laboratory of Periodontal Biology, Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada; ²Faculty of Dentistry and Department of Anatomy & Cell Biology, Faculty of Medicine, McGill University, Montreal, Canada

- 31 Characterization of Elastolytic Activities of Cathepsins Expressed in Macrophages**
 Nho B^{1*}, Percival D², Brömme D¹
¹Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada; ²Biochemistry, Merck Frosst Canada, Montreal, Canada
- 32 Cathepsin S in Experimental Collagen-Induced Rheumatoid Arthritis**
 Pan R^{1*}, Wilson S¹, Percival D², Brömme D¹
¹Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada; ²Biochemistry, Merck Frosst Canada, Montreal, Canada
- 33 Fatigue Testing of Controlled Memory Wire Nickel-Titanium Rotary Instruments**
 Shen Y¹, Qian W^{1*}, Abtin H¹, Gao Y², Haapasalo M¹
¹Division of Endodontics, Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada; ²State Key Laboratory of Oral Diseases, West China College & Hospital of Stomatology, Sichuan University, Chengdu, China
- 34 Dentin and Enamel Structure Revealed by Scanning Electron Microscopy**
 Roberts C^{1*}, Bugge C²
¹Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada; ²FEI Company, Hillsboro, Oregon, USA
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 Senini VW*, Firth JD, Putnins EE
 Department of Oral Biological & Medical Sciences, The University of British Columbia, Vancouver, Canada
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 Shen Y*, Stojicic S, Haapasalo M
 Division of Endodontics, Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada
- 37 An International Perspective on Dental Geriatric Curricula in Three Universities**
 Shin SW^{1*}, Padilha D², Bryant R³, MacEntee MI³
¹Department of Prosthodontics, Graduate School of Clinical Dentistry, Korea University, Seoul, Korea;
²Department of Community Oral Health, Federal University of Rio Grande do Sol in Porto Alegre, Brazil;
³Division of Prosthodontics & Dental Geriatrics, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada
- 38 Antibacterial Effect of a Novel Root Canal Irrigant**
 Stojicic S*, Shen Y, Haapasalo M
 Division of Endodontics, Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada
- 39 Evaluation of Canal Instrumentation Using GT Series-X™ versus Prosystem GT™**
 Tabatabaei N^{1*}, Coil JM¹, Kuttler S²
¹Division of Endodontics, Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada; ²Department of Endodontics, College of Dental Medicine, Nova Southeastern University, Fort Lauderdale, Florida, USA

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Screening Improves Time Delay to High-Risk Lesion DiagnosisTam DM^{1,2*}, Biggar H³, Wu J^{4,5}, Poh CF^{1,2,6}

¹Department of Oral Biological & Medical Sciences, The University of British Columbia, Vancouver, Canada (UBC); ²BC Cancer Research Centre, Cancer Control Research, Vancouver, Canada; ³College of Dental Hygienists of British Columbia, Victoria, Canada; ⁴Radiation Oncology & Developmental Radiotherapeutics, UBC; ⁵BC Cancer Agency, Head & Neck Radiation Oncology; ⁶BC Cancer Agency, Integrative Oncology

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Connexin-43 Regulates Key Genes Involved in Scar Formation

Tazemany R*, Jiang G, Laijava H, Häkkinen L

Laboratory of Periodontal Biology, Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada

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Investigating the Sustainability of Community Dental Clinics for the Underserved

Wallace B*, MacEntee M, Harrison R

Department of Oral Health Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada

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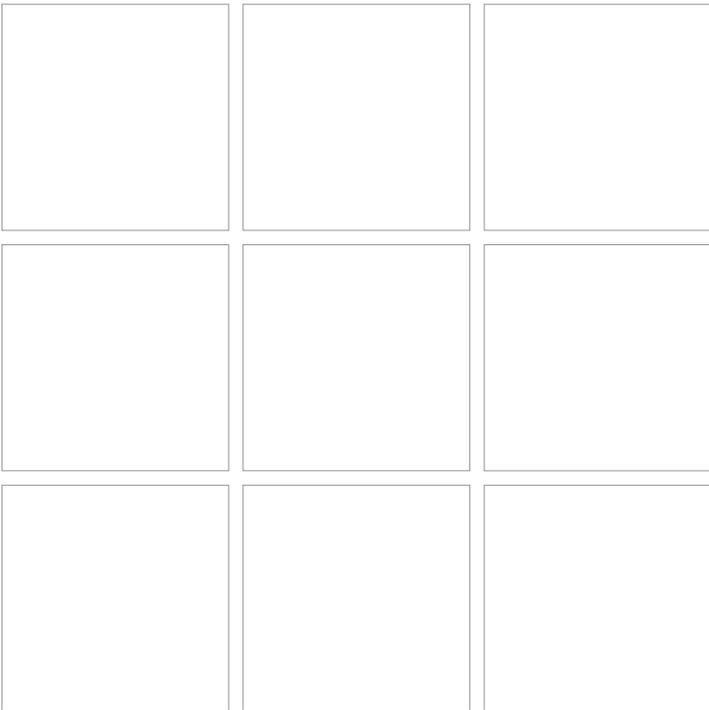
Curcumin Affects Proliferation, Migration and Apoptosis in Fibroblasts

Zhang DW*, Brömme D

Department of Oral Biological & Medical Sciences, Faculty of Dentistry, The University of British Columbia, Vancouver, Canada



RESEARCH SUPPORTERS
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 Michael Smith Foundation for
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 **National Institute of Dental and Craniofacial Research**


NSERC CRSNG

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 **ITI** International Team for Implantology

 **BCDHA**

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RESEARCH CLUSTERS

- CLINICAL RESEARCH, TECHNOLOGY TRANSFER & DENTAL MATERIALS SCIENCES RESEARCH CLUSTER
- COMMUNITY & EDUCATIONAL RESEARCH CLUSTER
- iMATRIX RESEARCH CLUSTER

CLINICAL RESEARCH, TECHNOLOGY TRANSFER & DENTAL MATERIALS SCIENCES RESEARCH CLUSTER

This cluster encompasses groups engaged in research on cancer diagnosis and prevention, dental biofilms, dental hygiene, dental instruments and materials, dental sleep medicine, forensic dentistry, and interactive dental anatomy. Our areas of expertise include biomaterials, dental morphology, obstructive sleep apnea, oral cancer, and root canal irrigation. We study matters such as bacterial eradication, cellular interactions, cephalometrics, community outreach programs, computational fluid dynamics, diagnostic tools, DNA analysis, fracture mechanisms, molecular markers, novel disinfection strategies, oral care products, surface characterization, and treatment strategies.

MARKUS P. HAAPASALO, Coordinator, Clinical Research, Technology Transfer & Dental Materials Sciences Research Cluster, markush@interchange.ubc.ca

FERNANDA ALMEIDA

Sleep apnea
falmeida@interchange.ubc.ca

BABAK CHEIROUDI

Cell/implant interaction, dental morphology
bchehrou@interchange.ubc.ca

JEFFREY COIL

Safety and clinical performance of new endodontic instruments
jcoil@interchange.ubc.ca

SANDRA FASTLICHT

Orthodontics, obstructive sleep apnea in children, headaches in sleep apnea, cephalometrics
sandrafa@interchange.ubc.ca

MARKUS HAAPASALO

Endodontic disinfection: Novel types of irrigation solutions, strategies for eradication of dental biofilm, hydrodynamic analysis of root canal irrigation
markush@interchange.ubc.ca

PAULINE IMAI

Clinical trials on oral self-care products and antimicrobials for the treatment of periodontal disease
imai@interchange.ubc.ca

DENISE LARONDE*

Oral cancer screening and risk prediction, including the use of clinical adjunctive devices, within the community
dlaronde@interchange.ubc.ca

ALAN LOWE

Orthodontics, obstructive sleep apnea, cephalometrics
alowe@interchange.ubc.ca

CAROLINE NGUYEN*

Biomaterials, oral cancer treatments, oral cancer rehabilitation outcomes
caroline.nguyen@ubc.ca

BENJAMIN PLISKA*

Orthodontics and obstructive sleep apnea in children and adolescents
pliska@interchange.ubc.ca

CATHERINE POH

Oral cancer prevention: Cancer risk prediction (molecular, histological and clinical), treatment development with visual tools, community outreach
cpoh@interchange.ubc.ca

N. DORIN RUSE

Biomaterials, surface characterization, fracture mechanics, fatigue, finite element modelling/analysis, structure-properties relationship
dorin@interchange.ubc.ca

YA SHEN

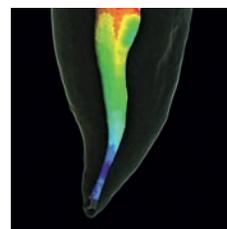
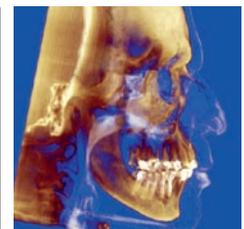
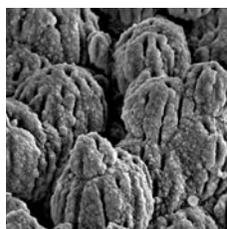
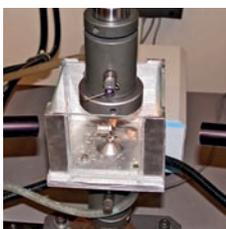
Predisposing factors in instrument failure, predictions of NiTi instrument life cycle
yashen@interchange.ubc.ca

DAVID SWEET O.C.

Recovery and analysis of trace amounts of forensic DNA evidence from biomaterials and human tissues in historical homicide investigations
boldab@interchange.ubc.ca

LEWEI ZHANG

Cancer risk prediction: Molecular markers, histological phenotypes as measured by computer-driven image system, clinical visual tools
lzhang@interchange.ubc.ca



Advancing oral health through
outstanding education, research,
and community service.



COMMUNITY & EDUCATIONAL RESEARCH CLUSTER

The research in this cluster relates to three of the four Canadian Institutes of Health Research themes: health services research; social, cultural, environmental, and population health; and clinical research—and to a range of educational studies. These domains are loosely interconnected and employ various quantitative and qualitative research methods and knowledge transfer. Our members conduct studies on diverse topics such as healthcare promotion, oral implants, dental caries, systematic literature reviews, and community service learning.

MICHAEL I. MACENTEE, Coordinator, Community & Educational Research Cluster, macentee@interchange.ubc.ca

JOLANTA ALEKSEJŪNIENĖ

Caries risk management in the elderly, ePortfolio learning, student-oriented learning in simulation courses
jolantaa@interchange.ubc.ca

W. LEANDRA BEST

Education-related scholarly activities: Enhancing student, faculty and community awareness of problem-based learning at UBC
drlbest@interchange.ubc.ca

MARIO BRONDANI

Community service learning and reflective journaling, dental geriatric psychometrics and positive health, beliefs and behaviours about oral sex/oral cancer/HPV
brondani@interchange.ubc.ca

S. ROSS BRYANT

Prosthodontics, geriatrics, patient-based assessments, oral implants, jawbone densitometry
rbryant@interchange.ubc.ca

KAREN CAMPBELL*

Pediatric dentoalveolar trauma, behaviour guidance, alternative caries management approaches
campbkar@interchange.ubc.ca

BONNIE J. CRAIG

Web-based online course development and evaluation, quality assurance in health care, dental hygiene care in residential care settings, dental hygiene education
bjcraig@interchange.ubc.ca

LAMIA EL-ADWAR

Effect of medical grade monitors on radiographic interpretation and clinical management of oral pathology
lamia@interchange.ubc.ca

INGRID EMANUELS

Acquisition of reflective vision skills in students: Does mirror skills pre-training improve learning, performance and stress levels during clinical simulation exercises?
emanuels@interchange.ubc.ca

MARK FOGELMAN

Teaching and learning enhancement
mfog@interchange.ubc.ca

KAREN GARDNER

Higher education: Digital technology as it pertains to higher education, eLearning including ePortfolios, social networking, peer review
drkg@interchange.ubc.ca

ROSAMUND HARRISON

Community-based oral health promotion, oral health disparities, early childhood tooth decay, randomized controlled trials, program evaluation
rosha@interchange.ubc.ca

DAVID MACDONALD

Systematic review in diagnostic radiology
dmacdon@interchange.ubc.ca

MICHAEL MACENTEE

Prosthodontics, geriatrics, health services, public health, prostheses on oral implants
macentee@interchange.ubc.ca

JAMES RICHARDSON

Investigating the benefit of “clickers”: Pilot project using a collaborative wiki platform for topics of interest to third year dental classes
jameseri@interchange.ubc.ca

HSINGCHI VON BERGMANN*

Large-scale comparative studies (e.g. TIMSS), PBL, quantitative research methods, content analysis, program evaluation, science education (K-16), dental education
hsingchi.von.bergmann@ubc.ca

JOANNE WALTON

Oral implant prosthodontics, dental education
jnwalton@interchange.ubc.ca

ELI WHITNEY

Critical thinking skills development, curriculum review and development
eli.whitney@ubc.ca

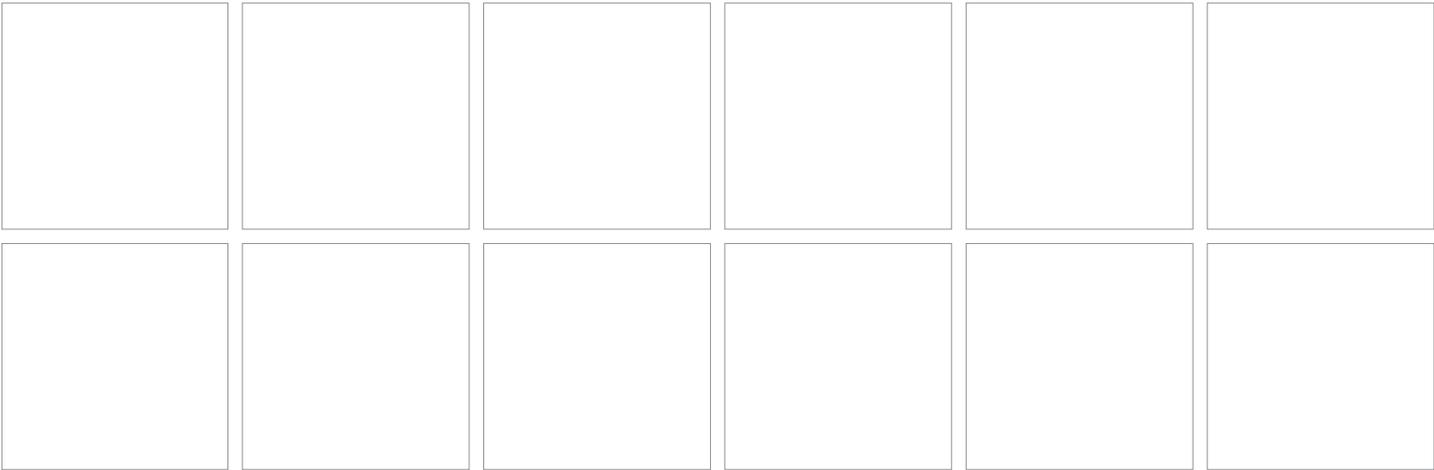
CHRISTOPHER WYATT

Prosthodontics, geriatrics, dental disease prevention, oral health promotion
cwyatt@interchange.ubc.ca

CHRISTOPHER ZED

Oral health disparities with a specific interest in underserved and under-accessed communities in rural and urban settings and less-developed countries
czed@interchange.ubc.ca





iMATRIX RESEARCH CLUSTER

iMatrix is an interactive research cluster combining the research interests of 11 highly-active laboratories in oral and biomedical sciences. We conduct basic science research in areas such as cancer, cell behaviour, craniofacial development, integrins, molecular biology, periodontal disease, proteases, proteomics, and wound healing. Highly-motivated undergraduate and graduate students, post-doctoral fellows and other trainees, as well as interested collaborators, are welcome to contact our member laboratories.

DIETER BRÖMME, Coordinator, iMatrix Research Cluster, dbromme@interchange.ubc.ca

DIETER BRÖMME
Lysosomal proteases and their role in health and disease
dbromme@interchange.ubc.ca

DONALD BRUNETTE
Regulation of cell behaviour on implant surfaces by substratum topography
brunette@interchange.ubc.ca

VIRGINIA M. DIEWERT
Prenatal craniofacial development in humans and mice: 3D morphometric analyses identify abnormalities that contribute to facial malformations such as cleft lip and/or palate
vdiewert@interchange.ubc.ca

LARI HÄKKINEN
Cell to extracellular matrix interactions in wound healing
lhakkine@interchange.ubc.ca

HANNU LARJAVA
Cell adhesion, integrins and signalling in wound healing and periodontal disease
larjava@interchange.ubc.ca

CHRISTOPHER OVERALL
Proteomic investigation of inflamed periodontal and synovial tissues and cancer to elucidate proteolytic mechanisms of cell signalling and in regulating inflammation
chris.overall@ubc.ca

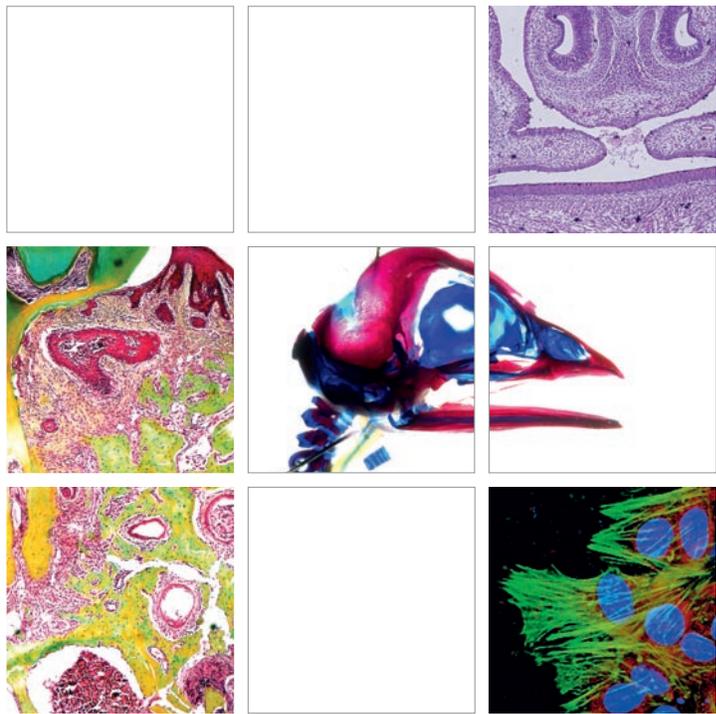
EDWARD PUTNINS
Periodontal disease pathogenesis and mesenchymal stem cell regeneration of craniofacial tissues
putnins@interchange.ubc.ca

JOY RICHMAN
Evolution and development of the face and teeth using bird and reptilian models
richman@interchange.ubc.ca

CLIVE ROBERTS
Synthesis and degradation of proteoglycans in the cell biology of wound healing
clive.roberts@ubc.ca

CHARLES SHULER
Studies focused on characterizing the molecular mechanisms regulating secondary palatal fusion with specific emphasis on the TGFβ signalling pathway
cshuler@interchange.ubc.ca

J. DOUGLAS WATERFIELD
Effect of surface topography on activation of the innate immune system
waterfld@interchange.ubc.ca





GRADUATE RESEARCH OPPORTUNITIES

PhD or MSc in Craniofacial Science

The UBC Faculty of Dentistry offers advanced study leading to a PhD or MSc in Craniofacial Science. The PhD program requires the successful completion of a research-specific curriculum, a comprehensive exam, and defense of a research-based thesis. A minimum of four years of full-time study is typically required. The MSc program requires successful completion of a research-specific didactic curriculum in conjunction with a research-based thesis. This program typically requires two years of full-time study; however, an extended part-time option for an MSc degree is available. Research options in one of the following three broad areas of study are available:

- Population health research explores the complex interactions (social, cultural, environmental) that affect the oral health of individuals, communities, and populations.
- Oral health-related clinical research includes both interventional and observational studies focusing on the following: disease prevention, diagnosis, risk, treatment, prognosis, and health care.
- Basic science research in the areas of biomaterials, cell biology, developmental biology, microbiology, and molecular biology.

These graduate programs are available as stand-alone degrees or may be completed as a combined diploma in a clinical specialty with a PhD or MSc degree (see criteria below). Clinical specialty training options are available in the following areas.



Endodontics

- PhD or MSc combined with a Diploma in Endodontics
- PhD degree (minimum 6 years) or MSc degree (minimum 3 years)
 - Diploma in Endodontics

Graduates will be eligible to take the examinations for specialty certification in endodontics offered by the Royal College of Dentists of Canada and the American Board of Endodontics.

Research Focus

- eradication of microorganisms from the root canal system
- development of unique *in vitro* and *ex vivo* models for biofilms which simulate oral *in vivo* biofilms
- industry collaborations on new devices to improve antimicrobial solutions
- safety and effectiveness of instrument systems to deliver disinfecting agents into the root canal
- impact of file design on the eradication of root canal microbes

Clinical Training

- treatment management (including surgery) of diseases and trauma of the tooth root and pulp

Criteria

- Applicants must hold a DMD or its equivalent
- Application deadline: July 1

Orthodontics

- PhD or MSc combined with a Diploma in Orthodontics
- PhD degree (minimum 6 years) or MSc degree (minimum 3 years)
 - Diploma in Orthodontics

Graduates will be eligible to take the examinations for specialty certification in orthodontics offered by the Royal College of Dentists of Canada and the American Board of Orthodontics.

Research Focus

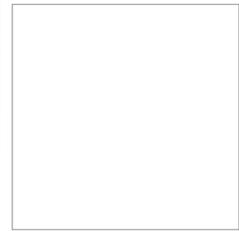
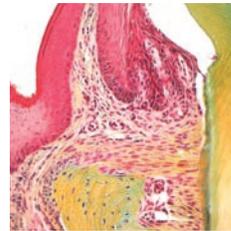
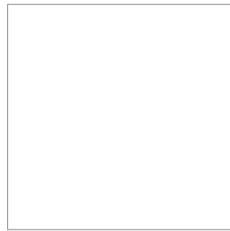
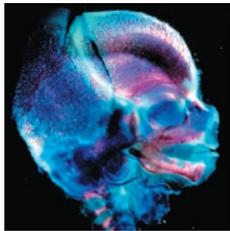
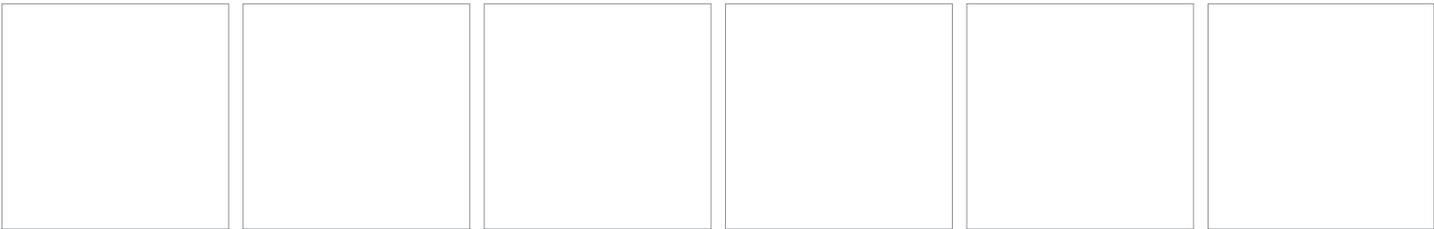
- craniofacial morphology and function in different populations
- efficiency and efficacy of treatment modalities
- societal and economic strategies that govern access to care
- craniofacial molecular and cellular control mechanisms
- impact of biomaterials on delivering orthodontic mechanics

Clinical Training

- diagnosis, prevention and treatment management of abnormal congenital or developmental relationships of the dentofacial anatomy from infancy to adulthood in diverse populations

Criteria

- Applicants must hold a DMD or its equivalent
- Postgraduate clinical and/or academic experience preferred
- Application deadline: September 1



Pediatric Dentistry

PhD or MSc combined with a Diploma in Pediatric Dentistry
 · PhD degree (minimum 6 years) or MSc degree (minimum 3 years)
 · Diploma in Pediatric Dentistry

Graduates will be eligible to take the examination for specialty certification in pediatric dentistry offered by the Royal College of Dentists of Canada and the diplomate examination of the American Board of Pediatric Dentistry.

Research Focus

- biomedical research (craniofacial development)
- clinical research (facial symmetry of cleft lip and palate)
- population health and health services research (oral health promotion and access to care for disadvantaged children)

Clinical Training

- diagnostic, preventive, therapeutic and consultative expertise for children and adolescents including those with special healthcare needs at BC Children’s Hospital Dental Department, Oral Health Centre at UBC Vancouver, and community settings throughout the province

Criteria

- Applicants must hold a DMD or its equivalent
- Application deadline: October 1

Periodontics

PhD or MSc combined with a Diploma in Periodontics
 · PhD degree (minimum 6 years) or MSc degree (minimum 3 years)
 · Diploma in Periodontics

This program is recognized by the American Dental Association and the Academy of Periodontology. Graduates will be eligible to take the examination for fellowship in the Royal College of Dentists of Canada and the board examination of the American Academy of Periodontology.

Research Focus

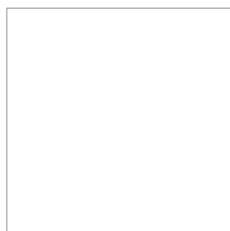
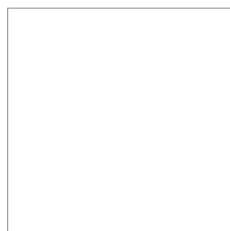
- molecular pathology of periodontal disease
- periodontal and skin wound healing
- clinical aspects of tissue healing around implants
- stem cell-mediated regeneration of lost tissues

Clinical Training

- management of tooth-supporting structures using non-surgical and surgical procedures
- tooth replacement with implants when needed

Criteria

- Applicants must hold a DMD or its equivalent
- Application deadline: September 1



Prosthodontics

PhD or MSc combined with a Diploma in Prosthodontics
 · PhD degree (minimum 6 years) or MSc degree (minimum 3 years)
 · Diploma in Prosthodontics

Graduates will be eligible to take the examinations for specialty certification in prosthodontics offered by the Royal College of Dentists of Canada and the American Board of Prosthodontics.

Research Focus

- geriatric dentistry
- oral implants and related prostheses
- caries management
- psychosocial aspects of aging
- community healthcare needs

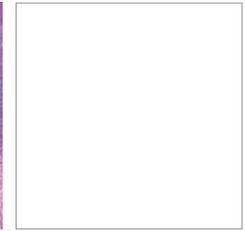
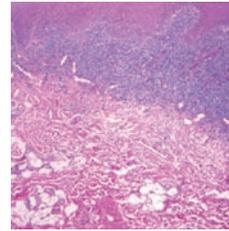
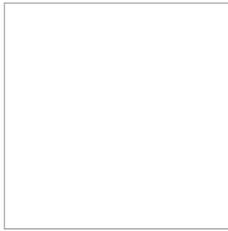
Clinical Training

- diagnosis, restoration and maintenance of oral function, comfort, appearance and health of patients by the restoration of natural teeth and/or the replacement of missing teeth and contiguous oral and maxillofacial tissues with artificial substitutes
- aesthetics/cosmetic dentistry
- crowns, bridges, veneers, inlays
- complete and removable partial dentures
- dental implants
- TMD-jaw joint problems
- traumatic injuries to the structures of the mouth

Criteria

- Applicants must hold a DMD or its equivalent
- Application deadline: October 1

POSTGRADUATE OPPORTUNITIES



General Practice Residency Program

- Advanced postgraduate training in dental specialties in a hospital setting
- Approximately 11 salaried, residency positions per year (one- or two-year)

Applicants choose to apply to the Pediatric Residency, Geriatric Dentistry Residency, or the General Practice Residency. All programs are approved by the Commission on Dental Accreditation of Canada.

A variety of local, provincial and international learning opportunities are available to expand the comprehensive training each resident receives. Community clinics provide oral healthcare to individuals on income assistance, job training and other pre-employment programs. Care to the people of Haida Gwaii supports a community dental health strategy. International experience broadens the scope of learning to understand regional disease processes, treatment modalities and cultural competencies.

Local-Based Residencies

- BC Cancer Agency, BC Children's Hospital, Vancouver Hospital & Health Sciences Centre, St. Paul's Hospital, Portland Community Clinic, First United Oral Health Program, Vancouver Native Health Society (and other community clinics)

Provincial-Based Residencies

- Haida Gwaii (Skidegate and Massett dental clinics), Kelowna Gospel Mission, Prince George Native Friendship Centre, Victoria (Cool Aid Community Health Centre)

International-Based Residencies

- Vietnam (University of Ho Chi Minh, National Hospital of Odonto-Stomatology and Ho Chi Minh City Cancer Centre)
- Cambodia (Angkor Hospital for Children, Siem Reap)
- United Kingdom (Solihull, Queen Elizabeth and Birmingham Children's Hospitals)

Application deadline: October 15

Complete program details at:

www.dentistry.ubc.ca/education/postgrad/gpr

Oral Medicine and Oral Pathology Residency Program

- Hospital-based postgraduate specialist residency
- Three pathways: Oral Medicine (OM, three years), Oral Pathology (OP, three years), or Combined (OMOP, four years)

Completion of any of the three pathways leads to a certificate and eligibility for the Royal College of Dentists of Canada fellowship examinations.

Local hospital-based training sites

- UBC-affiliated teaching hospitals: BC Cancer Agency, Vancouver Hospital & Health Sciences Centre, St. Paul's Hospital

Clinical practice component (training diagnosis, assessment and management)

- oral mucosal disease
- orofacial disorders associated with aging, systemic disease and medical therapies
- non-surgical salivary gland disorders
- rotations in anesthesia, internal medicine, rheumatology, neurosciences, dermatology, diagnostic pathology, oncology, otolaryngology, surgical pathology (including autopsy), head and neck pathology, and dermatopathology
- OM pathway: additional training in dental management of medically complex patients and diagnosis and treatment of orofacial pain and neurosensory disorders
- OP pathway: additional training in surgical and anatomical histopathology and laboratory procedures, techniques and diagnosis

Didactic component

- postgraduate-level seminars, case presentations and literature reviews
- teaching rounds
- ongoing basic and/or clinical research studies

Application deadline: November 1

Complete program details at:

www.dentistry.ubc.ca/education/postgrad/omop



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GRADUATE/POSTGRADUATE STUDIES

GRADUATE PROGRAMS

PhD or MSc in CRANIOFACIAL SCIENCE

These programs are research-oriented with no clinical components. The MSc degree normally requires two years full-time study and can also be taken part-time. The PhD degree requires a minimum of three years full-time study. Both offer research training in craniofacial sciences (cellular/molecular, clinical trial, or population health). **Application Deadline: January 31**

CLINICAL SPECIALTY GRADUATE PROGRAMS

PhD or MSc combined with a DIPLOMA in ENDODONTICS

This program offers a minimum three year MSc degree or a minimum six year PhD degree combined with a Diploma in Endodontics. Applicants must hold a DMD or its equivalent. **Application Deadline: July 1**

PhD or MSc combined with a DIPLOMA in ORTHODONTICS

This program offers a minimum three year MSc degree or a minimum six year PhD degree combined with a Diploma in Orthodontics. Applicants must hold a DMD or its equivalent. **Application Deadline: September 1**

PhD or MSc combined with a DIPLOMA in PEDIATRIC DENTISTRY

This program offers a minimum three year MSc degree or a minimum six year PhD degree combined with a Diploma in Pediatric Dentistry. Applicants must hold a DMD or its equivalent. **Application Deadline: October 1**

PhD or MSc combined with a DIPLOMA in PERIODONTICS

This program offers a minimum three year MSc degree or a minimum six year PhD degree combined with a Diploma in Periodontics. It is recognized by the American Dental Association and the American Academy of Periodontology. Applicants must hold a DMD or its equivalent. **Application Deadline: September 1**

PhD or MSc combined with a DIPLOMA in PROSTHODONTICS

This program offers a minimum three year MSc degree or a minimum six year PhD degree combined with a Diploma in Prosthodontics. Applicants must hold a DMD or its equivalent. **Application Deadline: October 1**

For more information on graduate programs visit www.dentistry.ubc.ca or contact: Viki Koulouris, vickybk@interchange.ubc.ca
T 604 822 4486 F 604 822 3562

POSTGRADUATE PROGRAMS

GENERAL PRACTICE RESIDENCY PROGRAM

In conjunction with University-affiliated teaching hospitals and community clinics, the Faculty offers positions in a one-year dental residency program beginning June 15. These residency positions **may** include pediatric or geriatric dentistry. **Application Deadline: October 15**

ORAL MEDICINE and ORAL PATHOLOGY RESIDENCY PROGRAM

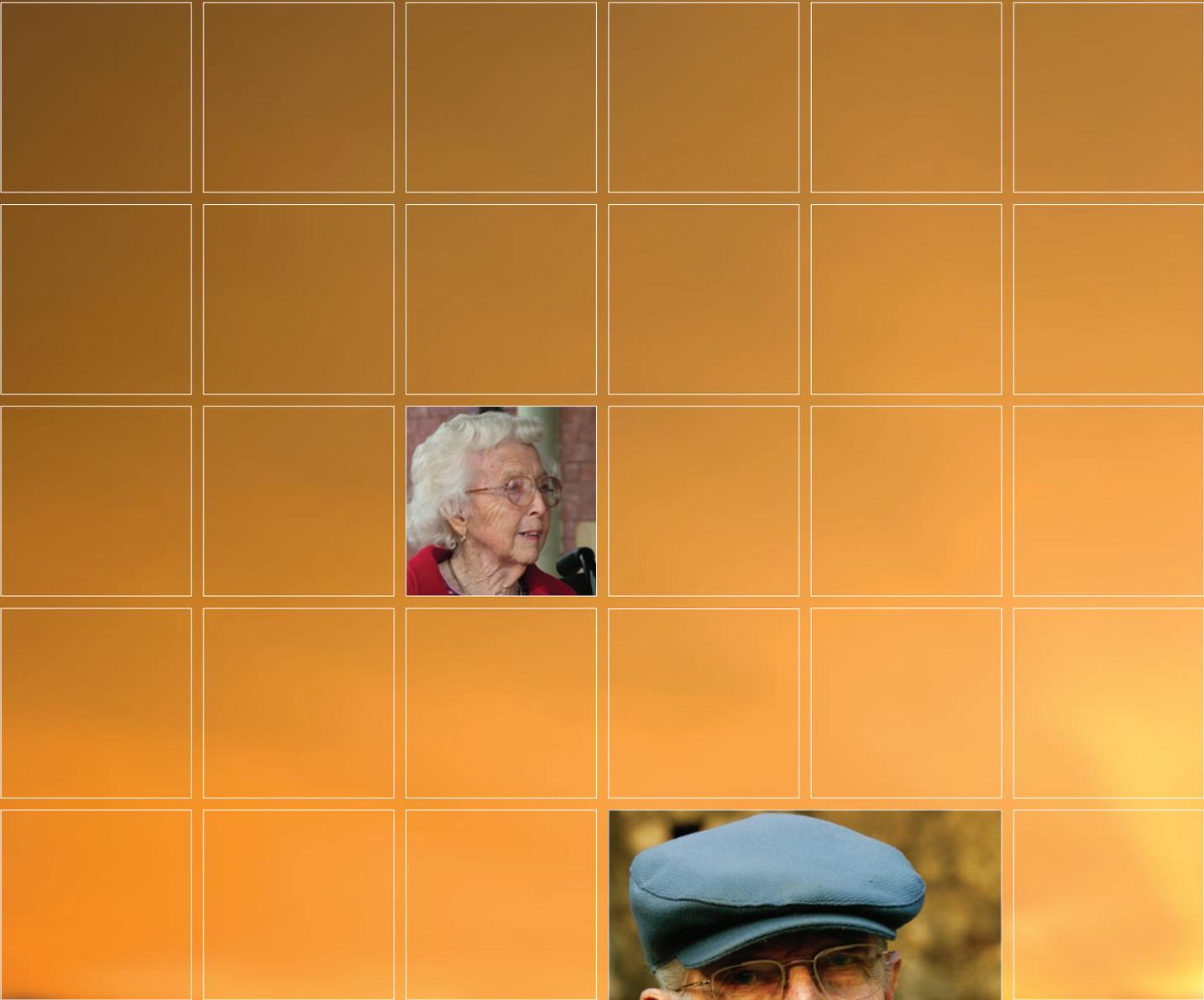
This postgraduate residency training in Oral Medicine and Oral Pathology is offered in conjunction with University-affiliated teaching hospitals. It consists of a three- or four-year hospital-based, stipended residency in one of three pathways: Oral Medicine, Oral Pathology, or both specialties combined.

Application Deadline: November 1

For more information on postgraduate programs visit www.dentistry.ubc.ca or contact: Dorothy Stanfield, dstanf@interchange.ubc.ca
T 604 822 0345 F 604 822 4532



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