

**KU LEUVEN**



**OMFS**  
IMPATH

Yearbook 2017



Yearbook 2017

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# 1

## Preface

Clinical progress can only be made when treatment results and patient outcome are carefully evaluated and when new ideas emerge from basic science. As such, an University provides a unique setting where clinical departments are strengthened and heavily influenced by their research counterparts. The same applies to the Department of Oral and Maxillofacial Surgery at Leuven University Hospitals. At least 3 complementary units are feeding the clinic with essential input: the department of oral and maxillofacial imaging, the 3D-lab facility and the OMFS-IMPACT research unit. Whereas the imaging department and the 3D-lab facility are fully integrated in the workflow of the daily clinic, the research department remains a separate unit, albeit both functionally and architectonically closely related to the clinical department. While many countries are building walls and protective measures against the inflow of foreign instream, research units remain meeting places for scientific young capital from all over the world. OMFS-IMPACT houses no less than 17 different nationalities, who all share a common goal. The society should cherish the research facilities at Universities as these are the beacons of hope in dark times. The OMFS-IMPACT Yearbook 2017 illustrates what can be achieved in a limited time frame when young scientific talents integrate and communicate with clinicians in a multicultural environment.



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Team

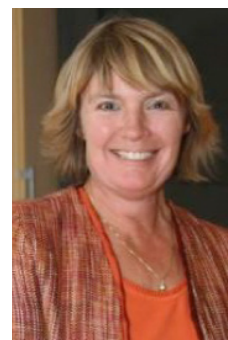
- A. STAFF
- B. RESEARCHERS
- C. ADMINISTRATIVE COORDINATOR

The OMFS-IMPACT research group relates to development and validation of surgical tools and image-based solutions to advance in oromaxillofacial surgery, with an ultimate aim to obtain an optimized treatment outcome while minimizing the peri- and postsurgical risks, such as neurovascular trauma. In order to achieve this, a global integration of digital datasets will enable the creation of a virtual replica of the patient. This may allow full simulation of the surgery as well as of its expected outcome. While the latter may help to further modify and fine-tune the planned surgery, the former integrated virtual data may allow presurgical simulations, development of image-based surgical tools and navigation. Research will be focused on image-based development of surgical aids with a validation of their clinical applicability. Research lines will include: optimized image acquisition with the least radiation dose, especially when children are concerned; image-based development of individualized surgical tools, while striving for advanced applications of e.g. 3D printing; maximized visualization of the trigeminal nerve pathway to minimize the surgical risks for trigeminal nerve damage. Such visualization may also assist in creating new access routes and surgical strategies to modulate trigeminal neuropathic pain.

## DEPARTMENT OF IMAGING &amp; PATHOLOGY - HEAD: PROF. TANIA ROSKAMS



## Tania ROSKAMS



Tania Roskams obtained her medical degree in 1989 at the University of Leuven. She specialized in Pathology (University of Leuven) and obtained her PhD in liver pathology in Leuven and Oklahoma University, USA. In 1996 she became head of the Liver research Unit, in 2002 of the Research group Translational Research and Pathology and in 2015 head of the department of Radiology and Pathology. She was nominated Professor in pathology in 2002. From 2007-2009 she was visiting professor at the University of Utrecht. In the clinical department she is responsible for hepatobiliary, pancreas and gastrointestinal pathology. Her main interest is liver research with special emphasis on liver progenitor cells and their role in regeneration and carcinogenesis.

## Peter VERMAELEN



Peter Vermaelen obtained his degree in Medical Laboratory Technology in 1994 and gained experience in different clinical and research topics. In 2000, he joined the pre-clinical unit of Nuclear Medicine & Molecular Imaging research group and was co-founder of the Molecular Small Animal Imaging Center (MoSAIC). Since 2012, he is as department manager responsible for the financial and personnel administration of the Department of Imaging & Pathology.



## A. STAFF

*Constantinus POLITIS*

Constantinus Politis is Oral and Maxillo-Facial Surgeon. He is currently Full Professor and Chairperson of the Department of Oral and Maxillofacial Surgery at Leuven University, KU Leuven, Belgium. He is an invited Lecturer at the EHSAL in Brussels. He graduated at the Catholic University of Leuven in medicine (MD, summa cum laude), in dentistry (DDS, magna cum laude). He specialized in oral and maxillofacial surgery at the Catholic University of Leuven. Postgraduate training was additionally followed in Arnhem (Stoelinga), Aachen (Koberg), Copenhagen (Pindborg), Göteborg (Bränemark) and San Francisco (Marx). He also holds a master degree in management (MM) from the Applied Economic Sciences at the University of Hasselt and a master degree in Hospital Management (MHM) from the Catholic University of Leuven. He became a recognition as medical specialist in management of health care data and is now member of the National Council of Hospital Facilities. He is Secretary General of the Professional Union of Belgian Oral and Maxillofacial Surgeons. He is acknowledged trainer of OMFS trainees. He defended his doctor's thesis on the subject of complications of orthognathic surgery (PhD). His professional field of interest is in orthognathic and orthodontic surgery and trigeminal nerve dysfunction. Clinical research projects include prevention and repair of iatrogenic trigeminal nerve injury, transplantation of teeth and orthognathic surgery. He is member of the Belgian Royal Academy of Medicine.

*Joseph SCHOENAERS*

Joseph Schoenaers obtained his medical and dental degrees at the University of Leuven in 1977 and 1980 respectively. Subsequently he specialised in Stomatology (1982 in Arnhem, Nederland - KU Leuven Belgium) and Maxillo-Facial Surgery (1989 University of Texas, Health Science Center at Dallas USA) with an additional specialisation in plastic and reconstructive surgery (Erasmus University Rotterdam).

He was appointed professor in Stomatology and Maxillo-Facial Surgery at KU Leuven (University Hospital 1994). From 1997 to 2012, he was also Departmental Head of the Clinical Department of Maxillo-Facial Surgery at University Hospital Leuven. Up till today his main focus lays with plastic and reconstructive surgery (oncology, congenital deformities).

On 30.09.2017 we have celebrated the honorary celebration of Professor Joseph Schoenaers.

*Reinhilde JACOBS*

Reinhilde Jacobs is dentist (1990), Doctor in Dental Sciences (1993; PhD University of Leuven), periodontologist (1996; KU Leuven) and Master in Dental Radiology (2002; University of London). With a European fellowship (1994-1995), she performed postdoctoral research at the Dept Orthopaedics (prof B Rydevik, Salghrenska Sjukhuset, Göteborg) and at the Institute of Applied Biotechnology (prof P-I Brånemark), University of Gothenburg, Sweden. She is full professor at the University of Leuven, visiting professor at Karolinska Institutet Stockholm (Sweden) and Dalian Medical University in China. R. Jacobs is coordinating the OMFS-IMPACT Research Group ([www.omfsimpath.be](http://www.omfsimpath.be)) of the Department of Imaging & Pathology, meanwhile being responsible for research, education and clinical activities in dentomaxillofacial radiology (heading the dentomaxillofacial radiology center). She is Secretary General of the International Association of DentoMaxilloFacial Radiology and past president of the European Academy of DentoMaxilloFacial Radiology. She is section editor imaging of Clinical Oral Investigations and associate editor of European Journal of Oral Implantology, and Oral Radiology. She has received the D Collen Research Travel Award (1994), the IADR Young Investigators Award (1998) and the Belgian Joachim Award in the Odontostomatology (1999). In 2013, she received a Dr Honoris Causa at the "Iuliu Hatieganu" University of Medicine and Pharmacy in Cluj-Napoca. She is involved in many multidisciplinary and interuniversity research collaborations, with a specific focus on oral implant physiology and imaging research. She has been actively participating in European projects (ref. Pisa, Minosquare, Osteodent, SedentexCT and Dimitra). She is (co) author of 5 books and more than 350 publications in peer-reviewed journals besides multiple invited lectures and publications in other journals or books.

*Paul LEGRAND*

Prof. Dr. Paul Legrand studied medicine at the KU Leuven and graduated as medical doctor in 1982. Afterwards he studied dentistry and graduated in 1984. He was trained as an oral- and maxillofacial surgeon at the KU Leuven and at the Rheinisch-Westfälische Technische Hochschule in Aachen. In 1988 he became a certified oral and maxillofacial surgeon. In oktober 1988 he founded the oral and maxillofacial surgery department in the Maria Middelaers Hospital in Lommel. Professor Legrand is a certified OMFS instructor and a member of the OMFS accreditation committee. Furthermore, he is on the board of the association of Flemish oral and maxillofacial surgeons (VVMKA) and the VBS MKA. Since 2011 professor Legrand is parttime affiliated with the UZ Leuven and in 2016 he was appointed guest lecturer at the KU Leuven. In Belgium professor Legrand is a pioneer in intravenous sedation in the OMFS department and he has made this is most important area of interest. His principal activities are dentoalveolar surgery, implantology and further development of intravenous sedation techniques.

*Titiaan DORMAAR*

Titiaan Dormaar is a Cranio-Maxillofacial and Cleft surgeon currently working in the department of oral and maxillofacial surgery at UZ Leuven. He obtained his MD from Maastricht University, where he was involved in a research project focusing on liquid ventilation in neonatal respiratory distress syndrome. He obtained his DDS from the Radboud University Nijmegen (the Netherlands). Before continuing his specialist training he spent 2 years in the UK, where he worked as a senior house officer in ENT and OMFS in Guildford and London. He completed his OMFS training at Utrecht University (the Netherlands). During his training in Utrecht he was the lead surgeon in an animal model research project on alveolar bone grafting with beta-TCP bone substitute in alveolar clefts. Following this he did a 3 year Fellowship in Cleft Surgery at Guy's and St Thomas' Hospital, London (UK), whilst he also provided regular on-call duties at King's College Hospital, a tertiary trauma centre.

*Ruxandra Gabriela COROPCIUC*

Ruxandra Gabriela Coropciuc is a Romanian Maxillofacial Surgeon, graduated from the university of Medical and Pharmacy Carol Davila, Bucharest as a Dentist in 2007 and as a Medical Doctor in 2012. In 2013 she obtained her specialization in Oral and Maxillo-Facial Surgery (Clinical Hospital or Oral and Maxillo-Facial Surgery, Bucharest). She joined the Department of Maxillo – Facial Surgery at the UZ Leuven, Belgium in 2013. Her clinical research is focussed on bisphosphonate-related osteonecrosis of the jaw bone. She has been appointed in 2016 as Clinical Staff Member in Oral and Maxillofacial Surgery at UZ Leuven.

*Michel BILA*

Dr. Michel BILA graduated from Antwerp University in 2009 as Medical Doctor and graduated from Leuven University in 2012 as Master in Dentistry. He obtained his specialty degree in Oral and Maxillo-Facial Surgery in 2016. He further specialized in Head and Neck Oncology at the Maxillofacial and Head and Neck Service at University College London Hospitals. He is Clinical Staff Member in Oral and Maxillofacial Surgery at UZLeuven. His clinical focus is Head and Neck Oncology and Reconstruction. His PhD research covers the use of immunotherapy in resectable head and neck squamous cell carcinoma (HNSCC).

## B. RESEARCHERS

*Michael M. BORNSTEIN*

Michael Bornstein has been appointed in 2016 as Clinical Professor in Oral and Maxillofacial Radiology at the Faculty of Dentistry, The University of Hong Kong, Hong Kong SAR, China. He is also Visiting Professor at the OMFS-IMPATh Research Group, Department of Imaging and Pathology, University of Leuven, Belgium. He obtained his dental degree (1998) and thesis (Dr. med. dent., 2001) at the University of Basel. He continued with a specialisation in oral surgery and stomatology in Basel (1998-1999, Prof. Dr. J. Th. Lambrecht) and Bern (2000-2002, Prof. Dr. D. Buser). In 2004, he was visiting assistant professor at the Department of Periodontics (Prof. Dr. D. Cochran) at the University of Texas Health Science Center at San Antonio, USA, with a grant from the Swiss National Science Foundation. From 2007-2014 he was head of the Section of Dental Radiology and Stomatology, University of Bern. In 2009, he obtained the Habilitation (Privatdozent / PhD) and in 2014 he became Associate Professor in the field of „Oral Surgery and Stomatology“. His fields of research include cone beam computed tomography (CBCT) in clinical dental practice, diagnostic imaging, stomatology/oral medicine, GBR procedures and dental implants. He has published over 120 original articles, and is the author / co-author of numerous case reports, review articles, and book chapters.

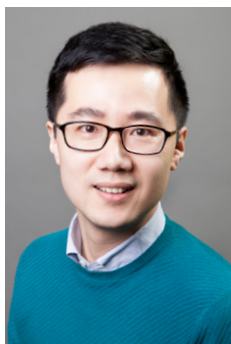
*Annelore DE GRAUWE*

Annelore De Grauwe was born on May 9th, 1977. She graduated as a dentist in 2001 at the University of Ghent, Belgium. After one year in private practice, she decided to obtain a Master degree in Paediatric Dentistry and Special Care at the University of Ghent, which she obtained in 2005, summa cum laude. She works as a paediatric dentist in her own private practice, and performs narcodontics in the hospitals of Bruges and Dendermonde. She is an active board member of the Belgian Academy of Paediatric Dentistry since 2005. She is also active member of the EAPF, IAPD, EADMFR, IADMFR, IADR and NVDMFR. From 2016 on, she works as a researcher at OMFS-IMPATh, with special interest in paediatric dentistry and imaging.

*Mostafa EZELDEEN*

Mostafa EzEldeen was born on July 19th, 1984 in Mansoura, Egypt. He obtained his Bachelor of Dental Medicine and Surgery (2007) from Mansoura University, Egypt and Master in Dentistry (2013), Summa cum laude, at the KU Leuven, Belgium. Further, he obtained a specialization in Paediatric Dentistry and Special Dental care (2012), at the KU Leuven under the guidance of Prof. Dr. Frans Vinckier and Prof. Dr. Dominique Declerck. In 2013, he obtained the diploma of Postgraduate studies in Advanced Medical Imaging at the KU Leuven under the guidance of Prof. Dr. Reinhilde Jacobs. He works as a dentist in private practice and UZ Leuven (department of Paediatric Dentistry and Special Dental Care). Currently he is a PhD candidate (OMFS-IMPACT, KU Leuven, Belgium) with Prof.

Dr. Reinhilde Jacobs as his promotor. His research topics are; assessment of the patterns of healing in teeth and bone after regenerative processes using Cone Beam Computed Tomography, developing of reliable teeth segmentation methods, bio-3D printing and chemokine-mediated regeneration in the oral and maxillofacial region.

*Yan HUANG*

Yan Huang is a dentist, graduated from Postgraduate Study of Advanced Medical Imaging and defended his PhD thesis of Biomedical Sciences in May 2014, at the Catholic University of Leuven, Belgium. He has been working at the OMFS-IMPACT research group for over 5 years, focusing on the use of Cone Beam CT for bone structural measurements. He is one of the principal researchers in the collaborative project from National Natural Science Foundation of China. At the moment he is Post-doc researcher in a FWO-funded research project.

*Alessandro LAMIRA*

Alessandro Lamira has qualified in Sao Paulo, Brazil 1998, awarded best student in Endodontics. He has trained in the Brazil, UK and Portugal. He is a Periodontist granted by University of Sao Paulo - Bauru. He was a clinical teacher at UNAERP University and King's College at Guys Hospital. He is currently a PhD student in endodontics at University of Sao Paulo - Ribeirao Preto doing part of his studies at Leuven University - Belgium.

*Laura NICOLIELO*

Laura Nicolielo is a Dental Surgeon (University of São Paulo, Brazil) (2009), Postgraduate in Oral Surgery (University of São Paulo, Brazil) (2010), Master in Applied Dental Sciences with focus in Stomatology and Radiology (University of São Paulo, Brazil) (2013), Implantologist (Opem Institute, Bauru, Brazil) (2013) and Postgraduate in Advanced Medical Imaging (KU Leuven, Belgium) (2014). In October 2013, she was granted by the Brazilian Government to start the PhD in the OMFS-IMPACT Research Group under supervision of Prof. Dr. Reinhilde Jacobs. Her main research topic is validation of 3D imaging modalities in the assessment of 1) Neurovascular structures of the jaw bones 2) Bone quality and quantity and 3) Condylar resorption after orthognathic surgery.



*Eman SHAHEEN*

Eman (Emmy) Shaheen was born on July 12th, 1982 in Giza, Egypt. She graduated with honor from the faculty of Computer Sciences and Information Technology (2003), Cairo University, Egypt where she also worked as a teaching assistant from 2003 till 2007 with major in Image Processing. Meanwhile, she obtained her Master's Degree in Video Processing (2007) from Cairo University. In 2008, she joined the team of Medical Physics where she finished with distinction her pre-doctoral studies about mammography and breast cancer (2009) in Biomedical Sciences at the KU Leuven, Belgium. She was granted a PhD scholarship from the OPTIMAM project (UK) in 2010 to develop, simulate and validate 3D models of breast lesions and tools to optimize the performance of breast tomosynthesis. She obtained her doctoral degree in 2014, KU Leuven, Belgium. In the same year, she started working in the department of Maxillo-facial surgery, University hospitals Leuven (Belgium) with Prof. Constantinus Politis as clinical engineer with focus on 3D planning of orthognathic surgeries. Next to the patient related work, she is the lead engineer of the research group of the OMFS-IMPATh (KU Leuven, Belgium) where she supervises students, supports different research projects related to 3D printing and 3D simulations. She is also collaborating with Materialise (Leuven, Belgium) as consultant to improve the CMF software for orthognathic surgeries next to other research related projects.

*Ali ALREEMAWI*

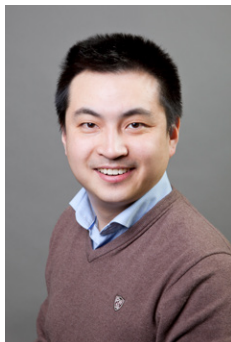
Ali Alreemawi was born in 1979 (Amman, Jordan). He obtained his Bachelor degree in Dental Surgery and medicine from University of Jordan in 2002. Then he joined The Royal Medical Services (Jordanian Armed Forces) where he got the specialization in endodontics (Jordanian National Board) in 2011. He is a visiting researcher in OMFS-IMPATh with a focus on the fields of Endodontics and Dental radiology.

*Bennaree AWARUN*

Bennaree Awarun is a graduated dentist from Chulalongkorn University, Thailand with the second class honor (2014). She was working as a general dentist in a private practice for two years in Bangkok (2015-2016). In 2017, she obtained her postgraduate diploma in Advanced Medical Imaging from KU Leuven, Belgium with great distinction. Her research focuses on CBCT exposure protocols in cleft lip and/or palate patients for diagnosis and treatment planning. From 2017 onward, she continues to work with OMFS-IMPATh group as specialation student under supervision of Prof. Jacobs.

*Andreas STRATIS*

Andreas Stratis was born in February 1981 in Larissa, Greece. He obtained his BSc in Physics at the Aristotle University of Thessaloniki, Greece in 2004 and his MSc in Medical Physics at the University of Surrey, UK. Since 2008 he is officially licensed to practice Medical Physics in Radiology, nuclear medicine and radiotherapy by the Hellenic Health Ministry. From 2008 to 2013 he was offering medical physics services in several radiology and nuclear departments in national and private hospitals in Greece. On January 2013 he moved to Belgium working for the Medical Physics Quality Assurance team of the UZ Leuven. He has served the Hellenic Association of Medical physicist as a Public Relations director (2010-2012) and Secretary Assistant (2012-2014). Since January 2014 he is a PhD student at the KU Leuven with his research focused on patient specific dosimetry via Monte Carlo simulations in dental Cone Beam CT.

*Yi SUN*

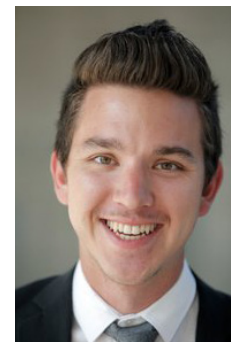
Yi Sun obtained his PhD in Biomedical Science, Master of Medical imaging and Bachelor in electronic engineering in China. Since 2007, he worked in the field of computer assistant surgery planning, with focus on oral and maxillofacial surgery. His main professional interest is template-based and image-guided solution for dental implant placement, design of digital splint for orthognathic surgery, mandible reconstruction using fibular bone. Currently he is responsible for the 3D surgical simulation team in the department of oral and maxillofacial surgery (UZ Leuven) and involved in development of image-guided surgical system (navigation system).

*Kostas SYRIOPOULOS*

Kostas Syriopoulos is dentist specialized in oral and maxillofacial radiology. He graduated as dentist from the University of Athens, Greece. He has a MSc degree (University of London) as well as a PhD degree (VU, Amsterdam) in Dental Radiology. He had an internship in the Dept. of Oral Radiology (Stellenbosch University, Cape Town). Further, he received the diploma in Health Physics level 3 (TU Delft). In the Netherlands Level 3 is a higher expert level of health physics, necessary for supervising in radionuclide laboratories or working in a medical profession with higher risk or responsibility, like clinical physics and nuclear medicine. From 2001 to 2016 he was a staff- member in the department of Dentomaxillofacial Radiology, ACTA, Amsterdam. Since February 2015 he has been a staff member in the Department of Imaging & Pathology, KU Leuven. His main professional interests are Diagnostic Radiology, Radiography Education and Radiation Protection.

*Giulia GALLO*

Giulia Gallo was born on 5 August 1990 in Italy. She graduated as a dentist in July 2016 from the University of Siena-Firenze, Italy. She was postgraduate research trainee at the OMFS-IMPATh Research Group (Department of Imaging and Pathology, Faculty of Medicine, KU Leuven) from September 2016 to March 2017. Her research topics was: Comparison Between 2D and 3D Facial Images for Clinical Assessment During Treatment Planning and Follow-up in Orthognathic Surgery. She is actually a resident student of Master Program in Prosthodontics Sciences at University of Siena and she works at her dental office.

*Jeroen VAN DESSEL*

Jeroen Van Dessel has a MSc in Biomedical Sciences (KU Leuven) and Msc in Advanced Medical Imaging (KU Leuven). Currently, he is a FWO-aspirant at Center for Developmental Psychiatry, KU Leuven, under promotorship of Prof. Dr. Marina Danckaerts. Where he studies the neural signature of delay aversion in adolescents with ADHD using Magnetic Resonance Imaging techniques. Besides his PhD in the psychiatry domain, he still remains active in dental radiology field as a researcher at the OMFS-IMPATh research group. He was a visiting researcher at University of São Paulo (Brazil), Pontifical Catholic University of Paraná (Brazil) and Karolinska Institutet (Sweden). His research topics include developing and validating tools for standardized bone quality assessment on CBCT, micro-CT analysis, finite element analysis and computer aided predictions.

*Ana Margarida RAMOS*

Ana Margarida Ramos is a 24-year old dentist, from Portugal. She recently graduated from her 5-year Dentistry degree by the University of Coimbra (July 2017). Starting on September 2017, she is participating in an ERASMUS+ Programme for recently graduated students at KU Leuven, integrating the OMFS-IMPATh Research Group as a visiting researcher, under the supervision of Professor Jacobs.

*Andres TORRES*

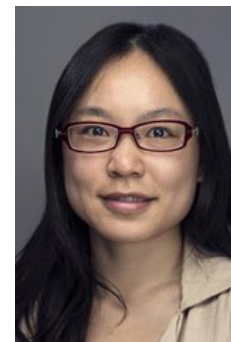
Andres Torres was born on July 4th, 1988 in Bogota, Colombia. He obtained his degree as General Dentist in 2012 from the University of Los Andes, Santiago, Chile. During the training in Dentistry, he participated twice in a research internship on CBCT in Endodontics at the KU Leuven, Leuven, Belgium, led by Professor Reinhilde Jacobs. In March 2014 he achieved the equivalence of foreign diploma "Titulo de Cirujano Dentista" with the Flemish degree of "Master of Science in Dentistry". In 2015 he obtained the diploma of Postgraduate studies in Advance Medical Imaging at the KU Leuven, Leuven, Belgium. Further, he obtained a specialization degree in Endodontics in July 2017, under the guidance of Professor Paul Lambrechts at the KU Leuven, Leuven, Belgium. He works as an

Endodontic specialist in private practice and currently he is a PhD candidate (OMFS-IMPATh, KU Leuven, Belgium) with Professor Reinhilde Jacobs as his promoter and Professor Paul Lambrechts as his co-promoter. His research topics are: Maxillary Sinus and Endodontics, 3-Dimensional Guided Endodontics, 3-Dimensional Assessment of Apical Radiolucencies and Characterisation of Root and Canal Morphology.

*Ruben PAUWELS*

Ruben Pauwels is a Master in Biomedical Sciences (2007), Master of Medical Imaging (2008) and PhD in Biomedical Sciences (2012). His research has focused on the use of CBCT in dentistry. His research topics include: 1. Radiation dosimetry 2. Technical image quality analysis 3. Optimization of exposures in CBCT 4. Applicability of Hounsfield Units in CBCT 5. Bone structure analysis in CBCT. As a Consortium member of the SEDENTEXCT project, he was a contributor to the European Guidelines on dental CBCT. He was a corresponding member of International Commission on Radiological Protection (ICRP) Task Group 88, and a co-author of ICRP Publication 129. He is currently acting as a consultant for the International Organization of Medical Physics (IOMP), the Thailand

National Electronics and Computer Technology Center (NECTEC) and the International Atomic Energy Agency (IAEA). He received the European Academy of Dentomaxillofacial Radiology (EADMFR) Research Award and Fellowship Grant in 2012. He is Associate Editor of the British Journal of Radiology.

*Ruiting ZHAO*

Ruiting Zhao is a specialisation student at the OMFS-IMPATh research group under supervision of Prof. dr. Reinhilde Jacobs. she studies the effect of bisphosphonates on the bone microstructure. She graduated in 2013 as dentist from the West China School of Stomatology in Sichuan, China. In 2016 she graduated as Master in Oral Sciences from the University of Bergen, Norway with a thesis investigating mechanisms leading to early aseptic loosening of implants.

*Dandan SONG*

Dandan Song was born on March 11th, 1990. She achieved her degrees in both Bachelor and Master of Oral Medicine from Dalian Medical University, China. During her Master, she worked on the effect of the different implant placement and loading protocols on the osseoperception around the implant. Currently she is a PhD Candidate in OMFS-IMPACT, KU Leuven, with professor Reinhilde Jacobs as her promoter. She is studying the effect of the bisphosphates and radiation on the jaw bone and blood vessel changes.

*Danieli Moura BRASIL*

Danieli Moura Brasil is dentist, Master in Dental Radiology (State University of Campinas, Sao Paulo, Brazil; 2015). Currently, she is PhD student in Dental Radiology at State University of Campinas-Brazil, doing part of her studies at KU Leuven, Belgium. Her research topic is optimization of CBCT scanning protocols: balancing dose and image quality.

*Karla DE FARIA VASCONCELOS*

Karla de Faria Vasconcelos is dentist, Doctor in Dental Radiology (PhD at State University of Campinas– Brazil, with a period of external internship at KULeuven - Belgium), Master in Dentistry (Federal University of Goiás - Brazil) and Specialist in Oral Radiology (University of Campinas). She has worked, as Radiologist, in a private radiology clinic. She is a collaborator professor of graduate program at Federal University of Goiás, teaching in the diagnostic imaging discipline. She has been involved in interuniversity research collaborations, with a specific focus on imaging research (digital radiography, cone beam computed tomography and microcomputed tomography). At present, she is a Post-doc researcher in an FAPESP - founded research project.

*Danilo SCHNEIDER*

Danilo Schneider is a dentist, Implantology specialist by Dentistry Brazilian Association (2002) and Master in Dentistry, area of Prosthodontics, by Pontifical Catholic University of Rio Grande do Sul (2015). Currently he is a PhD candidate at the same university. Since April, 2017 he is part of the OMFS-IMPACT research group as visiting PhD student. His research topic is CBCT and MicroCT image processing for bone quality and intensity quantitative analysis improvement, validation methods and tools with main focus on dental implants, reconstructive techniques and long-term follow-up of bone grafts, surgical and restorative aspects of dental implants. He was awarded first place for 2017 International Association for Dental Research (IADR), Implantology Research Group (IRG) Young Investigator Prize for Student Research - Clinical Sciences Division.



*Anna OCKERMANN*



Anna Ockerman is a PhD candidate at the OMFS-IMPATh research group in cooperation with the Department of Cardiovascular Sciences. She studies postoperative bleeding complications in patients taking new oral anticoagulants undergoing dental extractions, in the view of drafting guidelines concerning the use of these anticoagulants. Her promotors are Prof. dr. Reinhilde Jacobs, Prof. dr. Constantinus Politis (Department Imaging and Pathology, KU Leuven) and Prof. dr. Peter Verhamme (Department of Cardiovascular Sciences, KU Leuven).

Anna graduated in June 2017 as MSc in Biomedical Sciences (KU Leuven). Her Master's Thesis 'The eruption potential of wisdom teeth predicted by tooth inclination in a premature development stage', under promotorship of Prof. dr. Reinhilde Jacobs and Prof. dr. Constantinus Politis (Department Imaging and Pathology, KU Leuven), was awarded with the Best Master's Thesis Biomedical Sciences 2017, third place.

*Evelien EMBRECHTS*



Evelien Embrechts is a MSc in Biomedical Sciences, graduated in June 2017. She studied the age-related indications and complications of third molar removal during a one-year internship in our research group. Her promotor was Prof. dr. Reinhilde Jacobs.

*Mariana Quirino SILVEIRA SOARES*



Mariana Silveira is a dentist, Master in Dentistry, area of Dental Clinic (Federal University of Goiás, Goiânia, Brazil; 2013). Currently, she is Stomatology and Oral Biology PhD student at the University of São Paulo, Bauru, Brazil, doing parts of her studies at KU Leuven, Belgium. Her research topics are analysis of the influence of bisphosphonates in bone microarchitecture using Micro-CT and investigation of jaw bone grafts using Micro-CT.

*Isabela Bittencourt BASSO*



Isabela Bittencourt Basso is 23 years old. She comes from Curitiba, Brazil. She is in her last year of Dentistry education at Pontifícia Universidade Católica do Paraná, expecting to graduate in June 2018. Currently, she is doing an exchange program at KU Leuven (September 2017 - January 2018), where she is half of the time assisting in clinic, and half of the time doing research at OMFS-IMPATh research group with Professor Jacobs.

*Joeri MEYNS*

Dr. Joeri Meyns has a degree as a Medical doctor, Dentist and Maxillofacial surgeon. After obtaining his degree as a maxillofacial surgeon in 2011 he was a staff member at the Academic Hospital Maastricht (MUMC) for almost 4 years, where he further specialised in oral oncology and reconstructive surgery. He is currently working at the St Johns Hospital in Genk where he mainly focuses on orthognathic surgery and oncology. His research topic is growth modification of the face in children.

*Koenraad GRISAR*

Koenraad Grisar is a PhD Candidate at the OMFS-IMPATh Research Group (Department Imaging and Pathology, Faculty Medicine, Catholic University Leuven), where he studies the autogenous transplantation of maxillary canines. He received his Medical Degree from the Leuven University in 2013. He graduated in June 2016 as Master of Science in Dentistry at the Leuven University with a Master's Thesis in early dental implant survival and risk factors. He has had several articles published in internationally renowned journals on topics related to oral and maxillofacial surgery (Human papillomavirus and head and neck cancers; Osteoradionecrosis and medication-related osteonecrosis of the jaw; Dental implantology). Currently he is an oral and maxillofacial trainee at the University Hospital Leuven.

*Myrthel VRANCKX*

Myrthel Vranckx is a PhD candidate at the OMFS-IMPATh research group under promotorship of Prof. dr. Reinhilde Jacobs and Prof. dr. Constantinus Politis (Department Imaging and Pathology, KU Leuven). She graduated in June 2016 as MSc in Biomedical Sciences with a Master's Thesis in the use of CT imaging in Forensic Medicine (Faculty of Medicine, KU Leuven). She currently studies third molar pathology and postoperative complications associated with third molar surgery. Her multicentric research project is ongoing in 5 different hospitals in Belgium.

*Irem AYAZ*

Irem Ayaz was born on 27 February 1993. She graduated as a dentist in July 2016 from the University of Ankara, Turkey. She is a specialization student at the OMFS-IMPATh Research Group (Department of Imaging and Pathology, Faculty of Medicine, KU Leuven) since September 2016 and she is a student of Postgraduates Studies in Advanced Medical Imaging since September 2017. Her research topics are; Use of CBCT in Pediatric Orthodontics and Comparison Between 2D and 3D Facial Images for Clinical Assessment During Treatment Planning and Follow-up in Orthognathic Surgery.

*Emad ALI ALBDOUR*

Emad Ali Alb दौर born in 1979 (Amman, Jordan) . Obtained his Bachelor degree in Dental Surgery and medicine from University of Jordan in 2002, then joined The Royal Medical Services (Jordanian Armed Forces) where he got the specialization in prosthodontics (Jordanian National Board) in 2010, he is a visiting researcher in OMFS impath with a focus on the fields of Maxillofacial Implantology and Digital Dentistry.

*Ramy GABER*

Ramy Gaber, graduated from the Faculty of Dentistry; Ainshams University, Egypt 2005. Since 2007 he has been working at the Oral and Maxillofacial Surgery Department at the faculty where he received his surgical training and pursued his postgraduate studies. He completed his Master's degree in 2013 and the Doctorate Degree in 2017. In 2016, Ramy obtained a short term scholarship funded by the Egyptian ministry of Higher Education, to visit the OMFS-RESEARCH group for 6 months. His research interest is virtual planning and assesment in orthognathic surgery)

*Abdulhadi ALHELWANI*

Abdulhadi ALhelwani was born in 1990 (Damascus, Syria). He obtained his Bachelor degree in Dentistry from the International University of Science and Technology in 2013 with a full scholarship from the Syrian Ministry of Higher Education. He specialized in endodontics and practiced general dentistry in Damascus and Erbil for three years before he started in 2016 studying and researching in the field of advanced medical imaging as a postgraduate student in KU Leuven university (OMFS-IMPATh Research Group). His research focus is in the fields of dental 3D printing and 3D facial simulation in computer-aided maxillofacial planning systems.

*Daniel VASCONCELOS*

Daniel Vasconcelos was born on 16 May of 1993 in Viseu, Portugal. He graduated as a dentist in July 2016 from the University of Coimbra, Portugal. In September of 2016 started an exchange program at KU Leuven supported by the program Erasmus Plus, where he collaborated in the OMFS-IMPATh group under the supervision of Prof. Dr. Reinhilde Jacobs. In January of 2017, he started working in the hospital clinic until June of 2017.

*Els TIJSKENS*

Els Tijskens graduated as a dentist in 1984 at KU Leuven. She has been working as an endodontist since 2000, and has a second line practice for paediatric endodontics and traumata. In 2011 she obtained a license to use N2O-sedation, which she is applying on indication.

She is a Certified Member of the European Society for Endodontology (ESE), Fellow of the International Association for Dental Traumatology (IADT), founding board member and Past Secretary of the Flemish Society for Endodontology (FSfE vzw). She has been lecturing to GP's at NIVVT for more than a decade. She is involved in reading the CBCT images at UZ Leuven, and is teaching Medical Imaging at UCLL Opleiding Mondzorgkunde.

*Elke CLAERHOUT*

Elke Claerhout did a one-year internship in our research group, conducting a multicentric research project about third molar pathology and surgery. She graduated as MSc in Biomedical Sciences (KU Leuven) in June 2017. Her Master's Thesis was titled 'Epidemiological study of indications and complications of symptomatic versus prophylactic third molar extractions', and was written under promotorship of Prof. dr. Reinhilde Jacobs.

*Jimoh AGBAJE*

Jimoh Olumide AGBAJE is a dentist with a specialization in Oral medicine and pathology from University College Hospital Ibadan Nigeria. He was awarded the DAAD (Deutscher Akademischer Austauschdienst) scholarship to study in Germany from where he obtained Doctor of Medical Dentistry (Magna cum Laude) from Christian-Albrecht-University, Kiel, Germany. He graduated from Postgraduate Study of Advanced Medical Imaging and defended a PhD thesis of Biomedical Sciences in March 2012, at the Catholic University of Leuven, Belgium. He worked at the department of Oral and Maxillofacial Surgery Ziekenhuis Oost Limburg Schiepse Bos 6 Genk, Belgium where he coordinated research works in Orthognathic surgery and implant surgery between March 2011 and September

2012. He started working in the OMFS-IMPACT research group from June 2012. His research is focused on Reduction of Inferior alveolar nerve injury in bilateral sagittal split osteotomy (BSSO). At present, he is a Post-doc researcher in an FWO-funded research project.

*Laura-Lien POORTMANS*

Laura-Lien Poortmans is a Master Thesis student at the KU Leuven. She graduated as a BSc in Biomedical Sciences in June 2016 at the KU Leuven. She worked as a student researcher at the department of abdominal transplantation surgery in the University Hospitals Leuven on an animal study involving the pharmacological modulation of ischemia-reperfusion damage in the bowel (2016-2017). She is currently working on her Master's Thesis at OMFS-IMPACT research group under promotorship of Prof. dr. Peter Verhamme (Department of Cardiovascular disease), Prof. dr. Reinhilde Jacobs (Department Imaging and Pathology, KU Leuven) and Prof. dr. Constantinus Politis (Department of Oral and maxillofacial surgery). For her Master's thesis she studies postoperative bleeding complications

in patients taking new oral anticoagulants undergoing dental extractions. Her mentor is Anna Ockerman, PhD candidate at the OMFS-IMPACT research group.



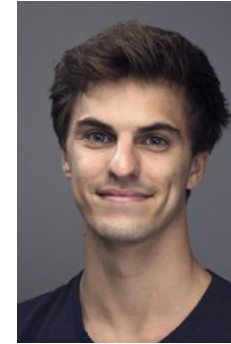
*Liesbeth LENAERTS*

Liesbeth Lenaerts is a Master Thesis student at KU Leuven. She graduated as BSc in Biomedical Sciences in June 2016 (University of Antwerp). For her Master's Thesis she studies the indications and postoperative complications associated with third molar surgery at the OMFS-IMPATh research group under promotorship of Prof. dr. Reinhilde Jacobs and Prof. dr. Constantinus Politis (Department Imaging and Pathology, KU Leuven). Her mentor is Myrthel Vranckx, PhD candidate at the OMFS-IMPATh research group. More info on [www.m3mka.be](http://www.m3mka.be).

*Maria Ignacia RUSQUE*

Maria Ignacia Rusque, was born on November 24th 1987 in Los Angeles, Chile. She is a graduated dentist (class 2013) from Universidad Mayor, Santiago, Chile. She worked as a general dentist in private practice and as a prosthodontist in a Public Medical Center in Santiago. In 2016, she started the specialization program in Oral and Maxillofacial Radiology at Universidad de los Andes, Chile.

During second year of her specialization program, she contributed in the research about the presence of the retromolar canal and its assesment with CBCT at the OMFS-IMPATh research group (KU Leuven, Belgium).

*Olivier VANDERHAEGHEN*

Olivier Vanderhaeghen is a Master Thesis student at KU Leuven. He graduated as BSc in Biomedical Sciences in June 2016 (University of Hasselt). He did an exchange program at the University of Eastern Finland (Winter 2016) where he worked for the research group in Neurobiology and Disease under supervision of Katja Kanninen. For his Master's Thesis he studies the effect of high dose bisphosphonate treatment on the microenvironment of the jaw bone and the development of jaw bone necrosis on a population of rats in comparison to clinical data from patients at the OMFS-IMPATh research group under promotorship of Prof. dr. Reinhilde Jacobs (Department Imaging and Pathology, KU Leuven).

*Sohaib SHUJAAT*

Sohaib Shujaat was born on November 29th, 1985. He achieved his degree in Bachelor of Dental Surgery (B.D.S) from Lahore Medical and Dental College, Lahore, Pakistan (2004 - 2008). After his graduation, he worked as an Internee in all clinical departments of dentistry at Lahore Medical and Dental College, Lahore, Pakistan (2009-2010). He obtained his "Master of Science" (MSc. Dent Sci) degree in Oral and Maxillofacial Surgery (360 credits) with merit from Glasgow Dental School and Hospital, University of Glasgow, Glasgow, United Kingdom, under the guidance of Professor Ashraf Ayoub (2010-2012). During his Masters, he worked on 4-Dimensional facial soft tissue changes in oncology patients. From March 2013 till September 2017, he worked as a Lecturer in the Department of

Oral and Maxillofacial Surgery and Course Director of Internal Medicine and Comprehensive Patient Management (CPM) for dental students at Imam AbdulRahman Bin Faisal University (Formerly University of Dammam), Dammam, Kingdom of Saudi Arabia. At the same instance, he served as a Specialist (Registrar) in the Department of Oral and Maxillofacial Surgery, King Fahd Hospital of the University. Currently he is a PhD candidate (OMFS- IMPATH, KU Leuven) with Professor Reinhilde Jacobs as his promotor. His research topic for PhD is related to three-dimensional analysis of hard and soft tissue changes in orthognathic surgery patients and to develop a start of art predictive model for treatment planning.

*Lesly Paola Gaitán ROMERO*

Lesly Paola Gaitán Romero is a PhD researcher at the OMFS-IMPATh Group. She is a dentist (University San Martín, Colombia), and an orthodontist (University Carabobo, Venezuela). She obtained Master of Health Care Management and Policy from KU Leuven. She was a lecturer of Orthodontics at the University of José Antonio Páez, Venezuela from 2010 - 2012. She was recognized for her Professionalism and Quality in delivering her knowledge and skills in the care of the Soldiers and Indigenous in Inírida - Colombia. She obtained high Average in the State Quality Examination of the National Higher Education Colombia 2007.

*Rogério Jardim CALDAS*

Rogério Jardim Caldas is a dentist (Federal University of Rio de Janeiro, Brazil), specialist in Stomatology (2002, Federal University of Rio de Janeiro, Brazil), Master in Morphological Sciences (2012, Federal University of Rio de Janeiro, Brazil) and PhD Student in Dental Sciences (2015, Bauru Dental School, University of São Paulo, Brazil). Since 2004, he has been stomatologist in the municipality of Angra dos Reis (Rio de Janeiro, Brazil). In 2010, he established the Dental Service at Mario Kroeff Cancer Hospital (Rio de Janeiro, Brazil), being the head and technical manager of it till now. In 2015, he became Member of the Hospital Dentistry Committee of the Regional Council of Dentistry of Rio de Janeiro (Rio de Janeiro, Brazil). He is one of the Founding Partner of the

Brazilian Society of Stomatology and Oral Pathology and Member of the Brazilian College of Hospital Dentistry and Intensive Care. Also, he is a Member of the Brazilian Association of Hematology, Hemotherapy and Cell Therapy and a Member of the Brazilian Association of Organ Transplantation. He has experience in the field of dentistry, with emphasis on Stomatology (Oral Medicine), acting on the following topics: hospital dentistry, cancer, medically compromised patients and HIV. He was awarded a grant by the Brazilian Federal Agency for Support and Evaluation of Graduate Education to spend six months in OMFS-IMPATh research group, taking part in researches focused on bone quality.

*Bart FALTER*

Bart Falter received an MD degree in 2009 and a DDS degree in 2012 from the Catholic University of Leuven. He was trained in Maxillofacial Surgery in Leuven, Arnhem and Bruges. He is currently working at the Jessa Hospital in Hasselt and as a consultant at the UZ Leuven. His interests are orthognathic surgery, traumatology and implantology, with special interests in three-dimensional imaging and treatment planning. His research topic is virtual planning in orthognathic surgery.

*Jardel Francisco MAZZI-CHAVES*

Jardel Francisco Mazzi-Chaves is a dentist, graduated at School of Dentistry of Ribeirão Preto, University of São Paulo, Brazil (2012). He has a Master in Endodontics (University of São Paulo) (2015) and is a Specialist in Endodontics (University of São Paulo) (2016). He has worked, as Endodontist, in a private clinic and, nowadays, he is a PhD student in Endodontics (University of São Paulo) and assistant professor of the endodontic specialization course (University of São Paulo). He is involved in several research collaborations using microCT and CBCT with expertise in root canal anatomy and root canals biomechanical preparation, physicochemical properties of root canal sealers, bond strength of endodontic materials and others. He is part of the OMFS Impath Research Group, doing part of his PhD in collaboration with Prof. dr. Reinhilde Jacobs, at KU Leuven (University of Leuven, Leuven, Belgium).

*Dorra CHAABOUNI*

Dorra Chaabouni was born on 18 March 1989 in Tunis, Tunisia. She graduated as a dentist in 2014 from the University of Monastir, Tunisia. She succeeded the national exam of specialization in dentistry. In 2015, she started her specialization training in oral and maxillofacial radiology in the university dental clinic of Monastir, Tunisia.

Dorra obtained in 2017 a scholarship funded by the Tunisian ministry of Higher Education, to visit the OMFS-impah RESEARCH group for 6 months. She is an adopt member in the IADMFR by the OMFS-impah. She is actually a resident in oral and maxillofacial radiology and practicing oral surgery. Her research interest are transalveolar transplantation of maxillary canines and French version of a glossary for international students.

*Anne Caroline OENNING*

Anne Caroline Oenning is dentist (Federal University of Santa Catarina – UFSC, Brazil) and dentomaxillofacial radiologist. She is Master in Dentistry (UFSC - Dentomaxillofacial Radiology) and Doctor in Oral Radiology (PhD, FOP / Unicamp). She was postdoctoral researcher sponsored by São Paulo Research Foundation (FAPESP) and associate researcher in the Department of Oral Diagnosis (FOP / Unicamp). She has worked as postdoctoral researcher at Paris Descartes Sorbonne University, collaborating with KU Leuven in the European project DIMITRA (Dentomaxillofacial pediatric imaging: an investigation towards low dose radiation induced risks). Recently, she has worked as visiting professor in the Oral Radiology area of the Piracicaba Dental School (Unicamp). Currently, she is

professor of the Oral Radiology Department of the Sao Leopoldo Mandic Dental School and Research Center (Campinas, Brazil). She is board member of the International Association of Dentomaxillofacial Radiology (IADMFR) representing Latin-American and Brazil.

*Lisanne GROENEVELDT*

Lisanne Groeneveldt obtained her Medical Degree at the Erasmus University, Rotterdam, Netherlands, in 2015 and graduated at this university as Master of Science in Molecular Medicine in 2017. She is currently studying dentistry at the KU Leuven in order to specialize in Oral and Maxillofacial Surgery. During her studies she was introduced to research into the molecular and cellular principles of the craniofacial area. She wrote both her Master theses about bone tissue engineering and participated in biomedical research focused on the prevention of osteoradionecrosis. Currently, she is performing research as a PhD candidate into craniofacial bone tissue engineering using periosteal cells.

## C. ADMINISTRATIVE COORDINATOR

### *Gabriela CASTEELS*



Gabriela Casteels is currently working as administrative research coordinator for the OMFS-IMPACT research group at the Department of Imaging and Pathology, KU Leuven. Her working experience is essentially situated within the organizational, coordinating and administrative support of organizations and professional societies.



**3**

**Research**

A. PROJECTS

B. AWARDS

C. PUBLICATIONS

- International peer-reviewed publications
- Book (chapter) publications
- Abstracts of congress presentations

D. CHAIRS

A. PROJECTS

National funding

**M3-Observatorium**

Epidemiological study on the surgical removal of third molars.

- Verbond der Belgische Beroepsverenigingen van Geneesheren-Specialisten MKA
- Koninklijke Belgische Vereniging Voor Stomatologie en Maxillo-Faciale Heelkunde (KBVSMFH).

*In samenwerking met Vlaams Ziekenhuisnetwerk KU Leuven*



**Innervation around implants**

Regeneration and remodeling of sensory innervation around dental implants treated with platelet-rich plasma.

- FWO



**Radiation dose simulations**

Patient-specific approach of CBCT imaging: custom made Monte Carlo simulations.

- OT



**Tooth autotransplantation**

The development and clinical application of CBCT-based tooth auto transplantation.

- FWO



**Trigeminal nerve injuries**

Reduction of Inferior alveolar nerve injury in bilateral sagittal split osteotomy (BSSO).

- FWO



**Computer-assisted maxillofacial surgery**

The development and clinical application of a computer assisted oral and maxillofacial surgery system.

- in collaboration with Materialise



**EXTRACT-NOAC**

Use of new oral anticoagulants in oral surgery



Bristol-Myers Squibb

## A. PROJECTS

### European funding

#### Dimitra

Dentomaxillofacial paediatric imaging: an investigation towards low dose radiation induced risks.

- Task 1: Characterising the risks
- Task 2: Quantifying the doses
- Task 3: Surveying the risks through epidemiology
- Task 4: Reducing risks through image quality optimization



## B. AWARDS

AUGUST 2017

XXI JABRO FIRST PRICE ORAL PRESENTATION

**Anne Oenning**, Reinhilde Jacobs,  
Ruben Pauwels, Andreas Stratis,  
Benjamin Salmon



JUNE 2017

BEST MASTER THESIS IN BIOMEDICAL SCIENCES 2017 - 3RD PLACE

**Anna Ockerman**

**KU LEUVEN**

JUNE 2017

1ST PRICE DENTSPLY SIRONA ORTHODONTIC RESEARCH AWARDS

**Véronique Christiaens**,  
Reinhilde Jacobs, Melissa Dierens,  
Stijn Vervaeke, Sebastiaan Koole,  
Jan Cosyn, Hugo Bruyn



## C. PUBLICATIONS

## INTERNATIONAL PEER-REVIEWED PUBLICATIONS

- Temmerman A., Vandessel J., Cortellini S., Jacobs R., Teughels W., Quirynen M. (2017). Volumetric changes of grafted volumes and the Schneiderian membrane after transcrestal and lateral sinus floor elevation procedures: a clinical, pilot study. *Journal of Clinical Periodontology*, 44 (6), art.nr. 10.1111/jcpe.12728, 660-671. (citations: 0) (most recent IF: 3.48).
- Nicolielo L., Van Dessel J., Shaheen E., Letelier C., Codari M., Politis C., Lambrichts I., Jacobs R. (2017). Validation of a novel imaging approach using multi-slice CT and cone-beam CT to follow-up on condylar remodeling after bimaxillary surgery. *International Journal of Oral Science*, 9 (3), art.nr. 10.1038/ijos.2017.22, 139-144. (citations: 0) (most recent IF: 3.93).
- Michael M. Bornstein M., Horner K., Jacobs R. (2017). Use of cone beam computed tomography in implant dentistry: current concepts, indications and limitations for clinical practice and research. *Periodontology 2000*, 73 (1), 51-72. (citations: 3) (most recent IF: 4.07).
- Stratis A., Zhang G., Lopez-Rendon X., Politis C., Hermans B., Jacobs R., Bogaerts R., Shaheen E., Bosmans H. (2017). Two examples of indication specific radiation dose calculations in dental CBCT and Multidetector CT scanners. *Physica Medica*, 41, art.nr. S1120-1797(17)30085-6, 71-77. (citations: 1) (most recent IF: 1.99).
- Agbaje J., Van de Castele E., Salem A., Anumendem D., Lambrichts I., Politis C. (2017). Tracking of the inferior alveolar nerve: its implication in surgical planning. *Clinical Oral Investigations*, 21 (7), 2213-2220. (citations: 1) (most recent IF: 2.31).
- Pittayapat P., Jacobs R., Michael M. Bornstein M., Odri G., Lambrichts I., Willems G., Politis C., Olszewski R. (2017). Three-dimensional Frankfort horizontal plane for 3D cephalometry: a comparative assessment of conventional versus novel landmarks and horizontal planes. *European Journal of Orthodontics, Ahead of print*, 1-10. (most recent IF: 1.62).
- Storms A., Vansant L., Shaheen E., Coucke W., Cadenas de Llano Perula M., Jacobs R., Politis C., Willems G. (2017). Three-dimensional aesthetic assessment of class II patients before and after orthognathic surgery and its association with quantitative surgical changes. *International Journal of Oral & Maxillofacial Surgery*, 46 (12), art.nr. YIJOM\_3745, 1664-1671. (citations: 0) (most recent IF: 1.92).
- Miclotte A., Grommen B., Lauwereins S., Cadenas de Llano Perula M., Alqerban A., Verdonck A., Fieuws S., Jacobs R., Willems G. (2017). The effect of headgear on upper third molars: a retrospective longitudinal study. *European Journal of Orthodontics*, 39 (4), 426-432. (citations: 0) (most recent IF: 1.62).
- Miclotte A., Grommen B., Cadenas de Llano Perula M., Verdonck A., Jacobs R., Willems G. (2017). The effect of first and second premolar extractions on third molars: A retrospective longitudinal study. *Journal of Dentistry*, 61, art.nr. S0300-5712(17)30074-X, 55-66. (citations: 0) (most recent IF: 3.46).
- Kustermans L., Van Buyten J., Smet I., Coucke W., Politis C. (2017). Stimulation of the Gasserian ganglion in the treatment of refractory trigeminal neuropathy. *Journal of Cranio-maxillo-facial Surgery*, 45 (1), art.nr. S1010-5182(16)30261-X, 39-46. (citations: 0) (most recent IF: 1.58).

## INTERNATIONAL PEER-REVIEWED PUBLICATIONS

- Widmann G., Bischel A., Stratis A., Bosmans H., Jacobs R., Gassner E., Puelacher W., Pauwels R. (2017). Spatial and contrast resolution of ultralow dose dentomaxillofacial CT imaging using iterative reconstruction technology. *Dentomaxillofacial Radiology*, art.nr. 10.1259/dmfr.20160452, 20160452. (citations: 0) (most recent IF: 1.59).
- Storms A., Miclotte A., Grosjean L., Cadenas de Llano Perula M., Alqerban A., Fieuws S., Sun Y., Politis C., Verdonck A., Willems G. (2017). Short-term hard and soft tissue changes after mandibular advancement surgery in Class II patients: a retrospective cephalometric study. *European Journal of Orthodontics*, 39 (5), art.nr. 10.1093/ejo/cjx003, 567-576. (citations: 0) (most recent IF: 1.62).
- Tanaka M., Bruno C., Jacobs R., Torisu T., Murata H. (2017). Short-term follow-up of masticatory adaptation after rehabilitation with an immediately loaded implant-supported prosthesis: a pilot assessment. *International Journal of Implant Dentistry*, 3 (1), art.nr. 10.1186/s40729-017-0070-x, 8. (citations: 0).
- Verquin M., Daems L., Politis C. (2017). Short-term complications after surgically assisted rapid palatal expansion: a retrospective cohort study. *International Journal of Oral & Maxillofacial Surgery*, 46 (3), art.nr. S0901-5027(16)30325-3, 303-308. (citations: 1) (most recent IF: 1.92).
- Dubron K., Meeus J., Grisar K., Desmet S., Dormaar T., Spaey Y., Politis C. (2017). Septic arthritis of the temporomandibular joint after acute otitis media in a child. *Quintessence International*, 48 (10), 809-813. (citations: 0) (most recent IF: 1.0).
- Shaheen E., Mowafy B., Politis C., Jacobs R. (2017). Semi-automatic forensic approach using mandibular midline lingual structures as fingerprint: a pilot study. *Journal of Forensic Odonto-Stomatology*, 35 (2), 41-47.
- Aerden T., Grisar K., Nys M., Politis C. (2017). Secondary hyperparathyroidism causing increased jaw bone density and mandibular pain: a case report. *Oral surgery, oral medicine, oral pathology and oral radiology, Ahead of print*, art.nr. S2212-4403(17)31202-6.
- Grisar K., Sinha D., Schoenaers J., Dormaar J., Politis C. (2017). Retrospective Analysis of Dental Implants Placed Between 2012 and 2014: Indications, Risk Factors, and Early Survival. *International Journal of Oral & Maxillofacial Implants*, 32 (3), art.nr. 10.11607/jomi.5332, 649-654. (citations: 2) (most recent IF: 2.26).
- Politis C., Agbaje J., Van Hevele J., Nicolielo L., De Laat A., Lambrichts I., Jacobs R. (2017). Report of Neuropathic Pain After Dental Implant Placement: A Case Series. *International Journal of Oral & Maxillofacial Implants*, 32 (2), art.nr. 10.11607/jomi.5241, 439-444. (citations: 0) (most recent IF: 2.26).
- Coopman R., Aerden T., De Temmerman G., Politis C. (2017). Re: Re: Mandibular Wing Osteotomy: technical modification. *The British Journal of Oral & Maxillofacial Surgery*, 55 (8), art.nr. S0266-4356(17)30271-1, 868-870. (citations: 0) (most recent IF: 1.22).
- Codari M., De Faria Vasconcelos K., Nicolielo L., Haiter Neto F., Jacobs R. (2017). Quantitative evaluation of metal artifacts using different CBCT devices, high-density materials and field of views. *Clinical Oral Implants Research*, 28 (12), art.nr. 10.1111/clr.13019, 1509-1514. (citations: 0) (most recent IF: 3.62).

- Jacobs R., Pauwels R., Scarfe W., De Cock C., Dula K., Willems G., Verdonck A., Politis C. (2017). Pediatric cleft palate patients show a 3- to 5-fold increase in cumulative radiation exposure from dental radiology compared with an age- and gender-matched population: a retrospective cohort study. *Clinical Oral Investigations, Epub ahead of print*, 1-11. (most recent IF: 2.31).
- Miclotte I., Vanhaverbeke M., Agbaje J., Legrand P., Vanassche T., Verhamme P., Politis C. (2017). Pragmatic approach to manage new oral anticoagulants in patients undergoing dental extractions: a prospective case-control study. *Clinical Oral Investigations*, 21 (7), 2183-2188. (citations: 1) (most recent IF: 2.31).
- Huang Y., Michael M., Bornstein M., Lambrichts I., Yu H., Politis C., Jacobs R. (2017). Platelet-rich plasma for regeneration of neural feedback pathways around dental implants: a concise review and outlook on future possibilities. *International Journal of Oral Science*, 9 (1), art.nr. 10.1038/ijos.2017.1, 1-9. (citations: 1) (most recent IF: 3.93).
- Aerden T., Grisar K., Neven P., Hauben E., Politis C. (2017). Numb chin syndrome as a sign of mandibular metastasis: A case report. *International Journal of Surgery Case Reports*, 31, art.nr. S2210-2612(17)30003-2, 68-71. (citations: 1).
- Khandelwal K., Ishorst N., Zhou H., Ludwig K., Venselaar H., Gilissen C., Thonissen M., van Rooij I., Dreesen K., Steehouwer M., van de Vorst M., Bloemen M., van Beusekom E., Roosenboom J., Borstlap W., Admiraal R., Dormaar T., Schoenaers J., Vander Poorten V., Hens G., Verdonck A., Bergé S., Roeleveldt N., Vriend G., Devriendt K., Brunner H., Mangold E., Hoischen A., van Bokhoven H., Carels C C. (2017). Novel IRF6 Mutations Detected in Orofacial Cleft Patients by Targeted Massively Parallel Sequencing. *Journal of Dental Research*, 96 (2), art.nr. pii: 0022034516678829 [Epub ahead of print], 179-185. (citations: 1) (most recent IF: 4.76).
- De Bruyn L., Coropciuc R., Coucke W., Politis C. (2017). Microbial population changes in patients with medication-related osteonecrosis of the jaw treated with systemic antibiotics. *Oral surgery, oral medicine, oral pathology and oral radiology, Ahead of print*, art.nr. S2212-4403(17)31204-X.
- Huang Y., Celikten B., De Faria Vasconcelos K., Nicolielo L., Lippiatt N., Buyuksungur A., Jacobs R., Orhan K. (2017). Micro-CT and nano-CT analysis of filling quality of three different endodontic sealers. *Dentomaxillofacial Radiology*, 46 (8), art.nr. 10.1259/dmfr.20170223, 20170223. (citations: 1) (most recent IF: 1.59).
- Coropciuc R., Grisar K., Aerden T., Schoenaers J., Politis C. (2017). Medication-related osteonecrosis of the jaw in oncological patients with skeletal metastases: conservative treatment is effective up to stage 2. *The British Journal of Oral & Maxillofacial Surgery*, 55 (8), art.nr. S0266-4356(17)30229-2, 787-792. (citations: 0) (most recent IF: 1.22).
- Reis Durão A., Morosolli A., Brown J., Jacobs R. (2017). Masseter muscle measurement performed by ultrasound: a systematic review. *Dentomaxillofacial Radiology*, 46 (6), art.nr. 10.1259/dmfr.20170052, 20170052. (citations: 0) (most recent IF: 1.59).
- Pauwels R., Sessirisombat S., Panmekiate S. (2017). Mandibular Bone Structure Analysis Using Cone Beam Computed Tomography vs Primary Implant Stability: An Ex Vivo Study. *International Journal of Oral & Maxillofacial Implants*, 32 (6), art.nr. 10.11607/jomi.6210, 1257-1265. (citations: 0) (most recent IF: 2.26).

## INTERNATIONAL PEER-REVIEWED PUBLICATIONS

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- Lobbezoo F., Jacobs R., De Laat T., Aarab G., Wetselaar P., Manfredini D. (2017). Kauwen op bruxisme. Associaties, gevolgen en behandeling. *Nederlands Tijdschrift voor Tandheelkunde*, 124 (-), 369-376.
- Nicolielo L., Jacobs R., Albdour E., Hoste X., Abeloos J., Politis C., Swennen G. (2017). Is oestrogen associated with mandibular condylar resorption? A systematic review. *International Journal of Oral & Maxillofacial Surgery*, 46 (11), art.nr. S0901-5027(17)31519-9, 1394-1402. (citations: 1) (most recent IF: 1.92).
- Christiaens V., Jacobs R., Dierens M., Vervaeke S., De Bruyn H., Koole S., Cosyn J. (2017). Intraoral radiography lacks accuracy for the assessment of peri-implant bone level - a controlled clinical study. *European Journal of Oral Implantology*, 4 (10), 435-441. (citations: 0) (most recent IF: 3.57).
- Chagas Nascimento M., de Almeida Boscolo S., Haite-Neto F., Dos Santos E., Lambrichts I., Pauwels R., Jacobs R. (2017). Influence of basis images and skull position on evaluation of cortical bone thickness in cone beam computed tomography. *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, 123 (6), 707-713. (citations: 0) (most recent IF: 1.42).
- Loyson T., van Cann T., Schöffski P., Clement P., Bechter O., Spriet I., Coropciuc R., Politis C., Vandeweyer R., Schoenaers J., Dumez H., Berteloot P., Neven P., Nackaerts K., Woei-A-Jin F., Punie K., Wildiers H., Beuselinck B. (2017). Incidence of osteonecrosis of the jaw in patients with bone metastases treated sequentially with bisphosphonates and denosumab. *Acta Clinica Belgica, Ahead of print*, art.nr. 10.1080/17843286.2017.1348001, 1-10. (most recent IF: 0.62).
- van Cann T., Loyson T., Verbiest A., Clement P., Bechter O., Willems L., Spriet I., Coropciuc R., Politis C., Vandeweyer R., Schoenaers J., Debruyne P., Dumez H., Berteloot P., Neven P., Nackaerts K., Woei-A-Jin F., Punie K., Wildiers H., Beuselinck B. (2017). Incidence of medication-related osteonecrosis of the jaw in patients treated with both bone resorption inhibitors and vascular endothelial growth factor receptor tyrosine kinase inhibitors. *Supportive Care in Cancer, Ahead of print*, art.nr. 10.1007/s00520-017-3903-5 (citations: 0) (most recent IF: 2.7).
- Mangione F., Ezeldeen M., Bardet C., Lesieur J., Bonneau M., Decup F., Salmon B., Jacobs R., Chaussain C., Opsahl-Vital S. (2017). Implanted Dental Pulp Cells Fail to Induce Regeneration in Partial Pulpotomies. *Journal of Dental Research*, 96 (12), art.nr. 10.1177/0022034517725523, 1406-1413. (citations: 0) (most recent IF: 4.76).
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- Esposito M., Jacobs R., Nieri M. (2017). Editorial. *European Journal of Oral Implantology*, 10 Suppl 1 (S2), 2-2. (citations: 0) (most recent IF: 3.57).
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- Oenning A., Salmon B., De Faria Vasconcelos K., Nicolielo L., Lambrichts I., Sanderink G., Pauwels R., Jacobs R. (2017). DIMITRA pediatric skull phantoms: development of age-specific pediatric models for dentomaxillofacial radiology research. *Dentomaxillofacial Radiology, Ahead of print*, art.nr. 10.1259/dmfr.20170285, 20170285. (most recent IF: 1.59).
- Pinto A., Daly A., Evans S., Almeida M., Assoun M., Belanger-Quintana A., Bernabei S., Bollhalder S., Cassiman D., Champion H., Chan H., Dalmau J., de Boer F., de Laet C., de Meyer A., Desloovere A., Dianin A., Dixon M., Dokoupil K., Dubois S., Eyskens F., Faria A., Fasan I., Favre E., Feillet F., Fekete A., Gallo G., Gingell C., Gribben J., Kaalund-Hansen K., Horst N., Jankowski C., Janssen-Regelink R., Jones I., Jouault C., Kahrs G., Kok I., Kowalik A., Laguerre C., Le Verge S., Lilje R., Maddalon C., Mayr D., Meyer U., Micciche A., Robert M., Rocha J., Rogozinski H., Rohde C., Ross K., Saruggia I., Schlune A., Singleton K., Sjoqvist E., Stolen L., Terry A., Timmer C., Tomlinson L., Tooke A., Vande Kerckhove K., van Dam E., van den Hurk T., van der Ploeg L., van Driessche M., van Rijn M., van Teeffelen-Heithoff A., van Wegberg A., Vasconcelos C., Vestergaard H., Vitoria I., Webster D., White F., White L., Zweers H., MacDonald A. (2017). Dietary practices in isovaleric acidemia: A European survey. *Molecular Genetics and Metabolism Reports*, 12, art.nr. 10.1016/j.ymgmr.2017.02.001, 16-22. (citations: 1).
- Stratis A., Touyz N., Zhang G., Jacobs R., Bogaerts R., Bosmans H. (2017). Development of a paediatric head voxel model database for dosimetric applications. *The British Journal of Radiology*, 90 (1078), art.nr. 10.1259/bjr.20170051, 20170051. (citations: 0) (most recent IF: 2.05).
- Gendviliene I., Legrand P., Nicolielo L., Sinha D., Spaey Y., Politis C., Jacobs R. (2017). Conservative management of large mandibular dentigerous cysts with a novel approach for follow up: Two case reports. *Stomatologija (Spausdinta)*, 19 (1), 23-32.
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- Liang X., Zhang Z., Gu J., Wang Z., Vandenbergh B., Jacobs R., Yang J., Ma G., Ling H., Ma X. (2017). Comparison of Micro-CT and Cone Beam CT on the Feasibility of Assessing Mandibular Trabecular Structures in Mandibular condyle. *Dentomaxillofacial Radiology*, 46 (5), art.nr. 10.1259/dmfr.20160435, 20160435. (citations: 0) (most recent IF: 1.59).

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- Van der Cruyssen F., Grisar K., Maes H., Politis C. (2017). Case of a cerebral abscess caused by *Porphyromonas gingivalis* in a subject with periodontitis. *BMJ Case Reports*, 2017, art.nr. bcr2016218845.
- Celikten B., Jacobs R., de Faria Vasconcelos K., Huang Y., Nicolielo L., Orhan K. (2017). Assessment of Volumetric Distortion Artifact in Filled Root Canals Using Different Cone-beam Computed Tomographic Devices. *Journal of Endodontics*, 43 (9), art.nr. S0099-2399(17)30371-0, 1517-1521. (citations: 0) (most recent IF: 2.81).
- Agbaje J., Castelee E., Salem A., Anumendem D., Shaheen E., Sun Y., Politis C. (2017). Assessment of occlusion with the T-Scan system in patients undergoing orthognathic surgery. *Scientific Reports*, 7 (1), art.nr. 10.1038/s41598-017-05788-x, 5356. (citations: 0) (most recent IF: 4.26).
- Ezeldeen M., Stratis A., Coucke W., Codari M., Politis C., Jacobs R. (2017). As Low Dose as Sufficient Quality: Optimization of Cone-beam Computed Tomographic Scanning Protocol for Tooth Autotransplantation Planning and Follow-up in Children. *Journal of Endodontics*, 43 (2), art.nr. S0099-2399(16)30749-X, 210-217. (citations: 1) (most recent IF: 2.81).
- Agbaje J., De Laat A., Constantinus P., Svensson P., Baad-Hansen L. (2017). Agreement between quantitative and qualitative sensory testing of changes in orofacial somatosensory sensitivity. *Journal of Oral Rehabilitation*, 44 (1), art.nr. 10.1111/joor.12455, 30-42. (citations: 1) (most recent IF: 2.1).
- Agbaje J., Sun Y., Salem A., Li Z., Politis C., Adu K. (2017). Achieved chin position after genioplasty follows the planned horizontal change better than the planned vertical change. *Journal of Cranio-maxillo-facial Surgery*, 45 (8), art.nr. S1010-5182(17)30196-8, 1287-1292. (citations: 0) (most recent IF: 1.58).
- Shaheen E., Khalil W., Ezeldeen M., Van de Castelee E., Sun Y., Politis C., Jacobs R. (2017). Accuracy of segmentation of tooth structures using 3 different CBCT machines. *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, 123 (1), 123-128. (citations: 0) (most recent IF: 1.42).
- Van Dessel J., Nicolielo L., Huang Y., Coudyzer W., Salmon B., Lambrichts I., Jacobs R. (2017). Accuracy and reliability of different cone beam computed tomography (CBCT) devices for structural analysis of alveolar bone in comparison with multislice CT and micro-CT. *European Journal of Oral Implantology*, 10 (1), 95-105. (citations: 1) (most recent IF: 3.57).
- Gaber R., Shaheen E., Falter B., Araya S., Politis C., Swennen G., Jacobs R. (2017). A Systematic Review to Uncover a Universal Protocol for Accuracy Assessment of 3-Dimensional Virtually Planned Orthognathic Surgery. *Journal of Oral and Maxillofacial Surgery*, 75 (11), art.nr. S0278-2391(17)30602-X, 2430-2440. (citations: 0) (most recent IF: 1.92).
- Politis C., Coropciuc R., Fedele S., Zhang J., Ma H., Saunders D. (2017). A multicenter case registry study on medication-related osteonecrosis of the jaw in patients with advanced cancer. Supportive Care in Cancer, Ahead of print, art.nr. 10.1007/s00520-017-4003-2 (most recent IF: 2.7). Christiaens V., De Bruyn H., De Vree H., Lamoral S., Jacobs R., Cosyn J. (2017). A controlled study on the accuracy and precision of intra-oral radiography in assessing interproximal bone defect morphology around implants. *Clinical Oral Implants Research*, 28 (S14), 287-287. (most recent IF: 3.62).

- De Faria Vasconcelos K., dos Santos Corpas L., da Silveira B., Laperre K., Padovan E., Jacobs R., Luiz de Freitas P., Lambrichts I., Boscolo N. (2017). MicroCT assessment of bone microarchitecture in implant sites reconstructed with autogenous and xenogenous grafts: a pilot study. *Clinical Oral Implants Research*, 00 (doi: 10.1111/clr.12799), 1-6. (citations: 3) (IF publication year: 3.62) (most recent IF: 3.62).
- Shaheen E., Sun Y., Jacobs R., Politis C. (2017). Three-dimensional printed final occlusal splint for orthognathic surgery: design and validation. *International Journal of Oral & Maxillofacial Surgery*, 46 (1), art.nr.S0901-5027(16)30275-2, 67-71. (citations: 0) (most recent IF: 1.92)
- De Mol A., Hauben E., Politis C. (2017). A Cystic Lesion of the Lower Lip. *JAMA Otolaryngology. Head & Neck Surgery*, 143 (5), art.nr. 10.1001/jamaoto.2
- Cockmartin L., Marshall N., Zhang G., Lemmens K., Shaheen E., Van Ongeval C., Fredenberg E., Dance D., Salvagnini E., Michielsen K., Bosmans H. (2017). Design and application of a structured phantom for detection performance comparison between breast tomosynthesis and digital mammography. *Physics in Medicine and Biology*, 62 (3), art.nr. 10.1088/1361-6560/aa5407, 758-780. (citations: 3) (most recent IF: 2.74).
- Meewis J., Govaerts D., Falter B., Grisar K., Shaheen E., Van de Vyvere G., Politis C. (2017). Reaching the vertical versus horizontal target position in multi-segmental Le Fort I osteotomy is more difficult, but yields comparably stable results to oneselement osteotomy. *International Journal of Oral & Maxillofacial Surgery*, Articles in Press, art.nr. S0901-5027(17)31643-0 (most recent IF: 1.92).

## BOOK (CHAPTER) PUBLICATIONS

- Politis C., Agbaje J., Jacobs R., Schoenaers J. (2017). Wondhelingsproblemen in de mond. *Het tandheelkundig jaar 2017*, Chapt. 3, (pp. 35-54) Bohn Stafleu van Loghum.  
**ISBN: 978-9-036-81029-6**
- Verquin M., Jacobs R., Willems G., Politis C. (2017). Kortetermijncomplicaties na chirurgisch geassisteerde snelle palatinale verbreding. *Het tandheelkundig jaar 2017*, Chapt. 6, (pp. 89-97) Bohn Stafleu van Loghum.  
**ISBN: 978-9-036-81029-6**
- Van Dyck J., Willemen E., Helsen L., Jacobs R., Bottenberg P., Jacquet W. (2017). De Belgische tandarts en radiologie. *Het tandheelkundig jaar 2017*, Chapt. 18, (pp. 235-246) Bohn Stafleu van Loghum.  
**ISBN: 978-9-036-81029-6**



## ABSTRACT OF CONGRESS PRESENTATIONS

- Celikten B., Jacobs R., De Faria Vasconcelos K., Huang Y., Shaheen E., Nicolielo L., Orhan K. (2017). Comparative evaluation of Cone Beam CT and Micro CT on volumetric distortion artefact in human teeth filled with bioceramic sealers. The 21st International Congress of Dental and Maxillo-Facial Radiology. Kaohsiung, 26-29 April 2017.
- Huang Y., Jacobs R., Celikten B., De Faria Vasconcelos K., Nicolielo L., Lippiatt N., Buyuksungur A., Orhan K. (2017). Assessment of filling quality of three root canal sealers using micro-CT and nano-CT images. The 21st International Congress of Dental and Maxillo-Facial Radiology. Kaohsiung, 26-29 April 2017.
- Ezeldeen M., Stratis A., Coucke W., Codari M., Politis C., Jacobs R. (2017). As low dose as sufficient quality: optimization of CBCT scanning protocol for tooth autotransplantation planning and follow-up in children. The 21st International Congress of Dental and Maxillo-Facial Radiology. Kaohsiung, 26-29 April 2017.
- Vansant L., Schoenaers J., Dormaar T., Cadenas de Llano Perula M., Verdonck A. (2017). Ankylosis of the temporomandibular joint after infection: report of four cases. Congress of the European Orthodontic Society. Montreux, Switzerland, 5-10 June 2017, Abstract No. 2163CP.
- Suryani I., Villegas Salvo N., Azhari A., Suhardjo S., Jacobs R. (2017). Anatomical and functional modeling of the upper airway in obstructive sleep apnea patient and controls. The 21st International Congress of Dental and Maxillo-Facial Radiology. Kaohsiung, 26-29 April 2017.
- Christiaens V., Jacobs R., Cosyn J., De Bruyn H. (2017). A controlled study on the accuracy and precision of intra-oral radiography in assessing interproximal bone defect morphology around implants. EAO Congress. Madrid, October 5th-7th, 2017.
- Shaheen E., Mowafy B., Politis C., Jacobs R. (2017). Semi-automatic forensic approach using mandibular midline lingual structures as fingerprint: a pilot study. IOFOS International Conference. Leuven, 13 - 16 September 2017.
- Huang Y., Zhaokai L., Van Dessel J., Salmon B., Huang B., Lambrechts I., Politis C., Jacobs R. (2017). Persistent benefit of platelet-rich plasma on trabecular architecture: a three-dimensional micro-computed tomographic study at 6-month follow-up. EAO Congress. Madrid, Spain, 5-7 October 2017.
- Politis C., Jacobs R. (2017). OMFS-IMPACT: Oral and Maxillofacial Surgery – Imaging & Pathology. Departmental Day. Leuven, Belgium, 26 October 2017.
- Thevissen P., De Tobel J., Hillewig E., Bogaert S., Deblaere K., Politis C., Verstraete K. (2017). Third molar MRI in Forensic Age Estimation: protocol Development and considerations for use. American Academy of Forensic Sciences. New Orleans, 16 February 2017, Abstract No. G7.
- Miclotte A., Grommen B., Cadenas de Llano Perula M., Jacobs R., Willems G. (2017). The effect of orthodontic treatment on the position and space available for upper and lower third molars. Congress of the European Orthodontic Society. Montreux, Switzerland, 5-10 June 2017, Abstract No. 2066 SP.
- Christiaens V., Dierens M., Vervaeke S., Koole S., Cosyn J., De Bruyn H., Jacobs R. (2017). Intra-oral radiography lacks accuracy for the assessment of peri-implant bone level - a prospective study. World Summit tour Dentsply-Sirona. Nice, June 25 - 2017.

- Jaeken K., Schoenaers J., Dormaar T., Cadenas de Llano Perula M., Verdonck A. (2017). Cystic malformation in upper and lower jaw: a case report. Congress of the European Orthodontic Society. Montreux, Switzerland, 5-10 June 2017, Abstract No. 2207CP
- Corpas L., Huang Y., Mowafey B., Semal P., Liang X., Lambrichts I., Politis C., Jacobs R. (2017). Morphological variability of the human mandible canal: A cone-beam computed tomography evaluation. International Conference on Forensic Odontology. Leuven, Belgium, 14-15 September 2017.
- Oenning A., Stratis A., Salmon B., Jacobs R. (2017). DIMITRA: Dentomaxillofacial paediatric imaging: an investigation towards low dose radiation induced risks by developing patient-and indication-specific imaging protocols. Junior Meeting EADMFR. Porto, Portugal, 5-8 February 2017.
- Ayaz I., Shaheen E., Gallo G., Politis C., Jacobs R. (2017). Comparison between 2D and 3D facial images for forensic identification. International Conference on Forensic Odontology. Leuven, Belgium, 13-16 September 2017.
- Gallo G., Shaheen E., Ayaz I., Jacobs R. (2017). Comparison between 2D and 3D facial images for clinical assessment during treatment planning and follow-up. Junior Meeting. Porto, Portugal, 5-8 February 2017.
- Belmans N., Gilles L., Vranckx M., Lambrichts I., Baatout S., Jacobs R., Moreels M. (2017). Age-related biological effects of dental cone-beam CT exposure. ICRP-ERPW. Paris, France, 10-12 October 2017.
- Belmans N., Gilles L., Vranckx M., Lambrichts I., Baatout S., Jacobs R., Moreels M. (2017). Age-related biological effects of dental cone-beam CT exposure. ERRS and GBS 2017. Essen, Germany, 17-21 September 2017.
- Belmans N., Gilles L., Vranckx M., Lambrichts I., Baatout S., Jacobs R., Moreels M. (2017). Age-related biological effects of dental cone-beam CT exposure. Knowledge for growth. Ghent, Belgium, 18 May 2017.
- Ayaz I., Agbaje J., Nicolielo L., Jacobs R. (2017). 4D jaw motion tracking: in vitro and in vivo validation to assess feasibility for clinical use. Junior Meeting EADMFR. Porto, Portugal, 5-8 February 2017.
- Rubira-Bullen I., Soares MS, Van Dessel J, Jacobs R, Santanna E, Lauris JP, Madeira M, Correa D, Yaeu R. (2017). Micro-CT comparison of bone remodeling using two different xenograft materials. IADR/AADR/CADR General Session & Exhibition, San Francisco, USA, March 22-25, 2017

## D. CHAIRS



### *ALEAMED KLS MARTIN CHAIR FOR OMFS*

Duration: 3 years (2013-2017)  
To support research in the field of trigeminal neuropathy in OMFS.



### *NOBEL BIOCARE CHAIR FOR ORAL AND MAXILLOFACIAL SURGERY*

Duration: 3 years (2013-2017)  
To support the research concerning the damage of the inferior alveolar nerve during mandibular surgery.



### *BICON CHAIR FOR ORAL AND MAXILLOFACIAL SURGERY*

Duration: 3 years (2014-2017)  
To help to cover the teaching and/or research expenses in oral rehabilitation after oncology therapy and treatment modalities after iatrogenic damage of the inferior alveolar nerve.



### *UEG CHAIR FOR NEW ADVANCES IN THREEDIMENSIONAL IMAGING FOR MAXILLOFACIAL DIAGNOSTICS AND THERAPY*

Duration: 3 years (2017-2019)  
To help to cover the teaching and/or research expenses in oral rehabilitation after oncology therapy and treatment modalities after iatrogenic damage of the inferior alveolar nerve.



### *STRAUMANN CHAIR FOR ORAL AND MAXILLOFACIAL SURGERY*

Duration: 3 years (2016-2019)  
The purpose of the Chair is prevention and treatment of nerve damage following implant surgery. Professor Politis is the chair holder and professor Jacobs is the co-chair holder.

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Lecturing

## A. SCIENTIFIC CONTRIBUTIONS AT CONGRESSES

- Oral presentations
- Poster presentations

## B. INVITED LECTURES

## A. SCIENTIFIC CONTRIBUTIONS AT CONGRESSES

### ORAL PRESENTATIONS

van Cann T., Loyson T., Constantinus Politis C., Debruyne P., Beuselinck B. INCIDENCE OF OSTEONECROSIS OF THE JAW IN PATIENTS BOTH TREATED WITH BONE RESORPTION INHIBITORS AND VASCULAR ENDOTHELIAL GROWTH FACTOR RECEPTOR TYROSINE KINASE INHIBITORS. Belgian Society of Medical Oncology, Brussels, Belgium, February, 14, 2017

Verhelst P.J., Van der Cruyssen F., Grisar K., Dormaar T., Schoenaers J., Coropciuc R., Politis C. TOOTH AVULSION AND REPLANTATION: OUT OF THE COMFORT ZONE. KBVSMFH meeting Brussels, Belgium, March, 18, 2017

Vranckx M., Politis C., Jacobs R., M3-OBSERVATORIUM PRELIMINARY RESULTS. KBVSMFH meeting Brussels, Belgium, March, 18, 2017

Piccart F., Dormaar T., Coropciuc R., Schoenaers J., Bila M., Politis C. DOG BITE INJURIES. KBVSMFH meeting Brussels, Belgium, March, 18, 2017

Shaheen E., Dormaar T., Coropciuc R., Schoenaers J., Jacobs R., Politis C. EVALUATING THE FEASIBILITY OF SOFTWARE TOOLS FOR VIRTUAL PLANNING OF FRACTURE MANAGEMENT. KBVSMFH meeting Brussels, Belgium, March, 18, 2017

Dormaar T., Sinha D., Schoenaers J., Coropciuc R., Politis C. FRONTAL SINUS FRACTURES: UZ LEUVEN EXPERIENCE. KBVSMFH meeting Brussels, Belgium, March, 18, 2017

Gruijthuijsen L., Dormaar T., Schoenaers J., Coropciuc R., Politis C. TRAUMATA TO THE FACIAL NERVE: FROM ANATOMY TO THERAPY. KBVSMFH meeting Brussels, Belgium, March, 18, 2017

Van de Steen L., Vanpoecke J., Grosjean L., Dormaar T., Schoenaers J., Coropciuc R., Politis C. TREATMENT OF CONDYLAR FRACTURES: THE CASE FOR – THE CASE AGAINST. KBVSMFH meeting Brussels, Belgium, March, 18, 2017

Shaheen E., Mowafey B., Politis C., Jacobs R. SEMI-AUTOMATIC FORENSIC APPROACH USING MANDIBULAR LINGUAL CANALS AS FINGERPRINT. Triennial IOFOS Conference on Forensic Odontology Leuven, Belgium, September, 14, 2017

Coropciuc R., Schoenaers J., Jacobs R., Legrand P., Politis C. Sialendoscopy: OLD PROCEDURE – NEW TECHNIQUES. KBVSMFH meeting Brussels, Belgium, November, 18, 2017

Sun Y., Shaheen E., Jacobs R., Politis C. ACCURACY OF LE FORT I SURGERY USING A CUSTOMIZED OSTEOSYNTHESIS PLATE. KBVSMFH meeting Brussels, Belgium, November, 18, 2017

Shaheen E., De Temmerman G., Falter B., Jacobs R., Politis C. ADVANCES IN 3D VIRTUAL PLANNING AND FOLLOW-UP OF ORTHOGNATHIC SURGERY. KBVSMFH meeting Brussels, Belgium, November, 18, 2017

Pauwels R., Politis C., Jacobs R. METAL AND MOTION ARTEFACT REDUCTION IN CONE-BEAM COMPUTED TOMOGRAPHY. KBVSMFH meeting Brussels, Belgium, November, 18, 2017

Ayaz I., Shaheen E., Gallo G., Politis C., JACOBS R. VALIDATION OF 3D FACIAL IMAGING VS 2D CLINICAL IMAGING FOR CLINICAL ASSESSMENT DURING TREATMENT PLANNING AND FOLLOW-UP. KBVSMFH meeting Brussels, Belgium, November, 18, 2017

EzEldeen M., Shaheen E., Politis C., Jacobs R. BIO-PRINTING OF SCAFFOLDS FOR DENTAL TISSUE REGENERATION. KBVSMFH meeting Brussels, Belgium, November, 18, 2017

Stratis A., Zhang G. Lopez-Rendon X., Hermans R, Politis C, Jacobs R, Bogaerts R, Bosmans H. A DOSE COMPARISON STUDY BETWEEN CBCT AND MSCT SCANNERS FOR TWO CLINICAL CASES VIA MONTE CARLO SIMULATIONS: ORTHOGNATHIC TREATMENT PLANNING AND TEMPORAL BONE ACQUISITIONS. Belgian Hospital Physicists Association - BHPA, 32nd Annual meeting, February 2016, Gent, BE

Groeneveldt L., Marechal M., Huylebroeck D., Luyten F., Politis C. BONE TISSUE ENGINEERING:MAPPING AND TESTING DIFFERENCES BETWEEN PERIOSTEAL CELLS FROM CRANIOFACIAL AND LONG BONES. KBVSMFH meeting Brussels, Belgium, November, 18, 2017

Coropciuc R., Huang Y., Shaheen E., Zhao R., Pauwels R., Schoenaers J., Jacobs R., Politis C. DETECTING EARLY BONE CHANGES BEFORE ANY CLINICAL EVIDENCE – PREDICTING MRONJ? KBVSMFH meeting Brussels, Belgium, November, 18, 2017

Van Hevele J., Nout E., Claeys T., Meyns J., Scheerlinck J., Politis C. BONE-ANCHORED CLASS III ELASTIC TRACTION: A MULTICENTRE STUDY. KBVSMFH meeting Brussels, Belgium, November, 18, 2017

## POSTER PRESENTATIONS

The 21st International Congress of Dental and Maxillo-Facial Radiology. Kaohsiung,  
26-29 April 2017Comparative Evaluation of Cone Beam CT and Micro CT on Volumetric Distortion Artifacts in Human  
Teeth Filled with Bioceramic SealersBerkan Celikten<sup>1,2\*</sup>, Reinilde Jacobs<sup>1,3</sup>, Karla deFaria Vasconcelos<sup>4,5</sup>, Yan Huang<sup>1,5</sup>, Eman Shaheen<sup>1</sup>, Laura Ferreira Pinheiro Nicolielo<sup>1</sup>, Kaan Orhan<sup>6</sup><sup>1</sup>OMFS IMPATH Research Group, Department of Imaging & Pathology, Faculty of Medicine, University of Leuven and Oral & Maxillofacial Surgery, University Hospitals Leuven, Leuven, Belgium<sup>2</sup>Ankara University, Faculty of Dentistry, Department of Endodontics, Ankara, Turkey<sup>3</sup>Oral facial diagnostics and surgery, Department of Dental medicine, Karolinska Institutet, Sweden.<sup>4</sup>Department of Oral Diagnosis, Division of Oral Radiology, Piracicaba Dental School, State University of Campinas, Piracicaba, Brazil.<sup>5</sup>State Key Laboratory of Oral Diseases, West China College of Stomatology, Sichuan University, Chengdu, China<sup>6</sup>Ankara University, Faculty of Dentistry, Department of DentoMaxillofacial Radiology, Ankara, Turkey

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## Objectives

The aim of this study was to assess the volume of volumetric distortion artifacts caused by root canal sealers using different CBCT devices in comparison to the gold standard micro CT imaging.

## Methods

Thirty extracted teeth which had no caries, root resorption, or fractures were selected. All teeth showed one straight round root canal.

A size #10 K-File (Maillefer, Ballaiges, Switzerland) was fitted in to the root canal until visible of file tip. Root canal working length was determined to subtracting 0.5 mm from this length. The canals were prepared with EndoSequence rotary nickel titanium files (Brasseler USA, Savannah, GA) using crown technique. The finishing file was 40/0.06.

## Root canal filling

The roots were divided randomly into 3 groups: AH Plus root canal sealer (Dentsply DeTrey, Konstanz, Germany) and 40/0.06 gutta-percha cones (Maillefer, Ballaiges, Switzerland), Total BC sealer (FKG Dentaire SA, Switzerland) and 40/0.06 Total BC points (FKG Dentaire SA, Switzerland), Sure Seal Root sealer (Sure Dent Corporation, Korea) and 40/0.06 gutta-percha cones (Maillefer, Ballaiges, Switzerland).

## CBCT Acquisition

Before images acquisition, root samples were placed in the empty tooth socket in a dry human mandible, covered with a soft tissue mimicking material. The dry human mandible was scanned using three CBCT devices, 3D Accutomo 170 (J. Morita, Kyoto, Japan), NewTom VGI EVO (NewTom, Verona, Italy) and Promax 3D Max (Planmeca Inc., USA).

## Micro CT Acquisition

To compare the filling volume of root canals from CBCT scanners, all teeth were scanned with a high-resolution, desktop micro CT system (Bruker Skyscan 1172, Kontich, Belgium). The scanning parameters were set at 100 kVp, 100-mA, 0.5-mm Cu filter, 13.67  $\mu$ m pixel size, 0.5 step rotation.

## CBCT and Micro CT Images Evaluation

All CBCT and Micro CT images were also imported to Mimics software (version 17.0, Materialise NV, Leuven, Belgium). To obtain the root canal filling volume, imaging segmentation was performed using automatic thresholding based on grey values (Fig. 1). Afterwards, the 3D model was generated and the filling volume was automatically calculated.

## Statistical analysis

Statistical analysis was performed by using SPSS 22.0 (SPSS Inc, Chicago, IL). Since the data were normally distributed, the analysis of variance (ANOVA) test was used to compare the inter-groups differences and paired t test was applied to compare intra-group differences.

## Results

The results of this study were shown in Tables 2 and 3. There was no significant difference among the bioceramic root canal sealers in terms of filling volume for the CBCT scans ( $p>0.05$ ). However, AH Plus had significant larger volume due to the volumetric distortion artifact than the other two bioceramic sealers ( $p<0.05$ ). These results were consistent for all CBCT devices. Filling volume measurements for each root canal sealer were found to be similar in micro CT examinations (Fig.1). Furthermore, no significant difference was found for the filling volumes among the tested root canal sealers in micro CT evaluations ( $p>0.05$ ).

In addition, CBCT devices showed more volumetric distortion artifact and obtained larger filling volumes than micro CT device ( $p<0.05$ ) (Fig 2-4). When contrasting the appearance of volumetric distortion artifacts using different CBCT devices, Accutomo 3D 170 and Newtom VGI Evo seemed to perform equally and significant better than the other machine tested.

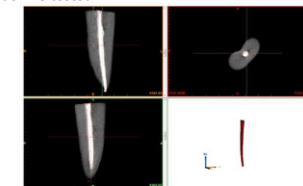


Figure 1

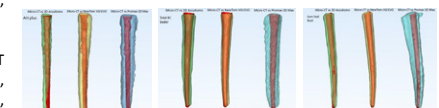


Figure 2

Figure 3

Figure 4

## Conclusion

The appearance of volumetric distortion artifact is CBCT-dependent and significantly worse than for micro CT. The artifact is also sealer-dependent. The differential effect of different sealers and distinct CBCT protocols should be further investigated to enable the use of bioceramic sealers without a significant impact on the post-treatment imaging.

## Acknowledgment

This study was supported by "The Scientific and Technological Research Council of Turkey" with support number: BIDEB 2219 under application number: 10598191501516

## Knowledge for growth. Ghent, Belgium, 18 May 2017

## Age-related biological effects of dental cone-beam CT exposure



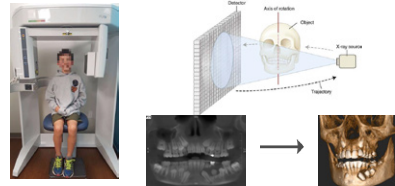
Niels Belmans<sup>1,2</sup>, Liese Gilles<sup>2</sup>, Myrthe Vranckx<sup>2</sup>, Ivo Lambrechts<sup>2</sup>, Sarah Baatout<sup>1</sup>, Reinhilde Jacobs<sup>2</sup>, Marjan Moreels<sup>1</sup>  
<sup>1</sup>Belgian Nuclear Research Centre, SCK-CEN, Mol, Belgium  
<sup>2</sup>Faculty of Medicine and Life Sciences, Biomedical Research Institute, Hasselt University  
<sup>3</sup>OMFS IMPATH Research Group, Department of Imaging and Pathology, Faculty of Medicine, University of Leuven and Department of Oral and Maxillofacial Surgery, University Hospitals Leuven, Leuven, Belgium  
 E-mail: nbelmans@sckcen.be



## Background

Cone Beam Computed Tomography (CBCT) is a multipurpose radiographic tool for diagnosis, treatment planning, follow-up and research in dental practice. CBCT is mostly used in the field of orthodontics, mainly in the pediatric population. Like conventional CT, CBCT uses X-rays to generate anatomical 3D images.

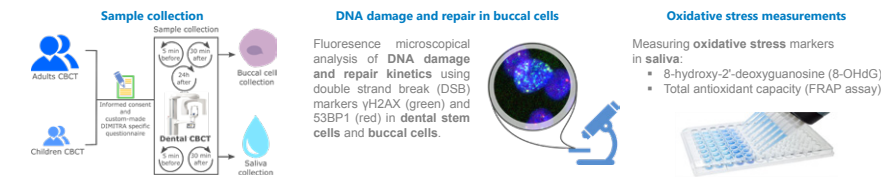
Although CBCT is considered a low dose imaging modality, it is uncertain that using CBCT is completely without risk. The doses used in CBCT can be up to 45 times higher than those used in dental X-rays. Investigating these low dose effects is of particular interest in pediatric CBCT examinations, since children are known to be more radiosensitive than adults.



## Objectives

The aim of this project is characterizing the potential biological effects involved in dental pediatric CBCT imaging. The focus is on measuring markers of the DNA damage & repair response and oxidative stress, using both *in vitro* and *ex vivo* analyses in the low dose region. Samples will be obtained from both pediatric and adult patients to check for age-dependent differences.

## Materials and methods



## Results

## DNA DSBs in buccal cells after CBCT exposure

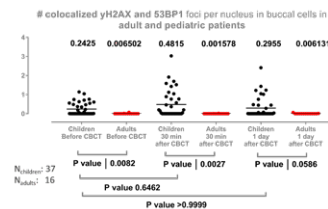


Figure 1. The amount of DNA DSBs in buccal cells before and after CBCT exposure in adults and children. No significant changes were observed in the amount of DNA DSBs in buccal cells after CBCT exposure in adults (data not complete) nor in children. However, the amount of DNA DSBs is significantly higher in children than in adults before ( $P = 0.0082$ ) and 30 minutes ( $P = 0.0027$ ) after CBCT exposure.

## Oxidative stress detection in saliva after CBCT exposure

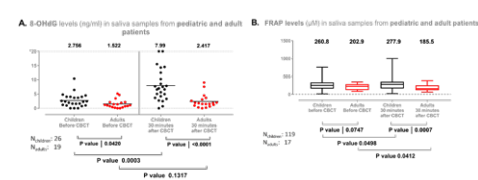


Figure 2. The amount of 8-OHdG and the total antioxidant capacity in saliva samples from adults and children before and after CBCT exposure. A. Increasing trends are seen in the 8-OHdG levels, though it is not significant in adults, it is in children ( $P = 0.1317$  and  $P = 0.0003$ ). The amount of 8-OHdG is higher in children, both before and after CBCT ( $P = 0.042$  and  $P < 0.0001$ ). B. The antioxidant capacity increases significantly in children ( $P = 0.0498$ ), it decreases significantly in adults ( $P = 0.0412$ ). It is also significantly higher in children after CBCT exposure ( $P = 0.0007$ ).

## Conclusion

Exposure to diagnostic CBCT:

- Does not significantly increase the amount of DNA DSBs in children and adults, though children have higher levels of DNA DSBs before and 30 minutes after CBCT exposure.
- Does not cause a significant increase in 8-OHdG levels in children and adults, though children have higher levels of 8-OHdG before and after CBCT exposure.
- Causes a significant decrease in antioxidant capacity in adults and a significant increase in children. The antioxidant capacity is significantly higher after CBCT exposure in children than in adults, but not at baseline.

Acknowledgements: The DIMITRA project has received funding from the FP7-OPERA project under grant agreement n°604984. Niels Belmans is a recipient of a SCK-CEN – UHasselt PhD grant.

SCK-CEN || Boeretang 200 || BE-2400 Mol || www.sckcen.be || info@sckcen.be || Posternr:

## Congress of the European Orthodontic Society. Montreux, Switzerland, 5-10 June 2017

## 2066 SP The effect of orthodontic treatment on the position and space available for upper and lower third molars

Miclotte A<sup>1</sup>, Grommen B<sup>2</sup>, Cadenas de Llano-Pérola M<sup>1</sup>, Jacobs R<sup>2</sup>, Willems G<sup>1</sup>

<sup>1</sup>Department of Oral Health Sciences – Orthodontics, KU Leuven and Dentistry, University Hospitals Leuven, Leuven, Belgium

<sup>2</sup>OMFS IMPATH, Department of Imaging & Pathology, Faculty of Medicine, University Leuven & Maxillofacial Surgery, University Hospitals Leuven, Leuven, Belgium

KU LEUVEN

Oral Health  
SCIENCES

ORTHODONTICS

## AIM

This retrospective study investigated the effects of headgear therapy and premolar extractions on the retromolar space and the position of third molars in growing patients.

## MATERIALS AND METHOD

To investigate the effects of headgear therapy, a sample of 294 Class II orthodontic non-extraction patients was collected, of which 160 patients were treated with headgear.

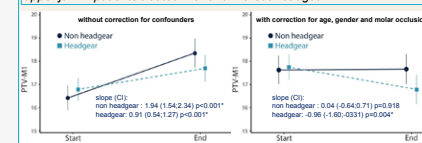
To investigate the effect of premolar extractions a sample of 296 patients was collected, of which 218 patients were treated without extractions and 78 patients were treated with extractions of first or second premolars.

The eruption space for third molars was measured on pre- and posttreatment lateral cephalograms, whereas the angulation, vertical position and the mineralization status of third molars was evaluated using pre- and posttreatment panoramic radiographs.

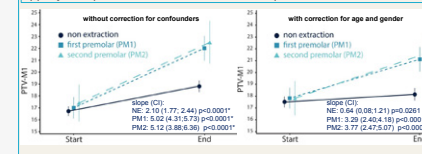
## RESULTS

In both samples, the eruption space for the third molars increased during treatment. In patients treated with premolar extractions this increase was significantly higher compared to patients treated without extractions, whereas in patients treated with headgear the increase in eruption space for the upper third molar was significantly lower compared to patients treated without headgear. After correction for age and gender, the retromolar space even decreased in patients treated with headgear.

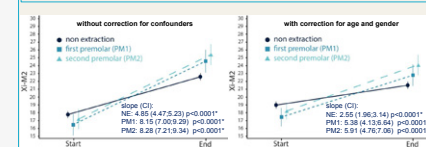
Results of a bivariate regression model for the retromolar space in the upper jaw in patients treated with and without headgear



Results of a bivariate regression model for the retromolar space in the upper jaw in patients treated with and without premolar extractions



Results of a bivariate regression model for the retromolar space in the lower jaw in patients treated with and without premolar extractions

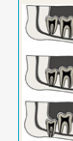


Additionally, significantly less third molars of patients treated with premolar extractions were situated under the cemento-enamel junction of the second molar after treatment.



variable	measurement	NE	PM1	PM2
Anchor (vertical)	start of treatment	5	8	6
	stage 1 and 3 (%)	95	92	94
	end of treatment	15	43	42
	stage 1 and 3 (%)	85	57	58

Pairwise comparison for change:  
 NE vs PM1:  $p = 0.0237^*$   
 NE vs PM2:  $p = 0.0021^*$   
 PM1 vs PM2:  $p = 0.542$



variable	measurement	NE	PM1	PM2
PMV	start of treatment	0	4	0
	PMV 1 (%)	5	0	0
	PMV 2 (%)	99	96	100
	end of treatment	2	16	5
PMV 1 (%)	PMV 1 (%)	10	10	33
	PMV 2 (%)	88	74	62
probability of PMV < a at end of treatment		88.7	73.5	61.7

Pairwise comparison:  
 NE vs PM1:  $p = 0.024^*$   
 NE vs PM2:  $p = 0.0001^*$   
 PM1 vs PM2:  $p = 0.331$

The change in angulation and the mineralization status did not significantly differ between patients treated with or without premolar extractions, neither in patients treated with or without headgear appliance.

## CONCLUSION

The retromolar space and the position of third molars significantly change during orthodontic treatment in growing patients. Orthodontic treatment with headgear has a negative effect on the eruption space for the upper third molars, whereas premolar extractions have a positive effect on the eruption space for the upper and lower third molars. It is therefore important to always take into account the position of third molars during orthodontic treatment planning.

## CORRESPONDING AUTHOR

Prof. Dr. G. Willems, Dept of Oral Health Sciences - Orthodontics, KU Leuven & Dentistry, UZ Leuven, Kapucijnenvoer 7, B-3000 Leuven, Belgium, g.willems@uzleuven.be



93<sup>rd</sup> Congress of the European Orthodontic Society  
 Montreux Switzerland  
 June 5-10, 2017





## 2207 CP CYSTIC MALFORMATION IN UPPER AND LOWER JAW: A CASE REPORT

KU LEUVEN

ORTHODONTICS  
@ KU LEUVENJaeken K<sup>1</sup>, Schoenaers J<sup>2</sup>, Dormaar T<sup>3</sup>, Cadenas de Llano P rula M<sup>1</sup>, Verdonck A<sup>1,3</sup><sup>1</sup>Department of Oral Health Sciences – Orthodontics, KU Leuven and Dentistry, University Hospitals Leuven, Leuven, Belgium  
<sup>2</sup>Department of Oral and Maxillofacial Surgery, University Hospitals Leuven, Leuven, Belgium  
<sup>3</sup>Multidisciplinary Cleft Lip and Palate Team, University Hospitals Leuven, Leuven, Belgium

## AIM

The aim of the present study is to describe the treatment of a cyst malformation in the upper and lower jaw, observed in 2 patients respectively.

## SUBJECTS AND METHOD

The first patient was a 10 year-old boy, with no previous medical history, seeking treatment at our department of orthodontics. Medical files, radiographs and dental casts were collected. The panoramic radiograph revealed a cystic structure with widening and radiolucency in the maxillary sinus.

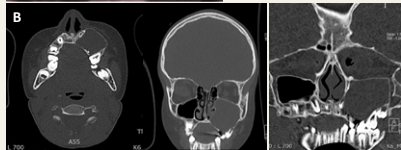


Fig 1. 10 year old boy with cystic structure in maxillary sinus. A: panoramic radiograph 20/9/2008. B: CBCT 22/9/2008.

The second patient was a 18 year-old girl, with no previous medical history, in retention follow-up after orthodontic treatment. When upgrading the medical files and collecting radiographs and dental casts a radiolucency was seen on the panoramic radiograph at the retromolar space. In both cases additional CBCT as well as biopsy were taken.

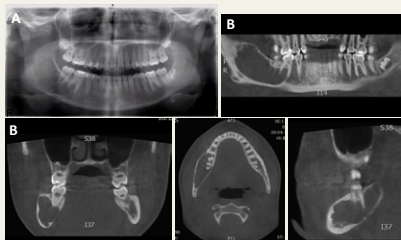


Fig 2. 18 year old girl with radiolucency at the retromolar space. A: panoramic radiograph 9/4/2013. B: CBCT 9/4/2013.

## TREATMENT RESULTS

In the first case the CBCT confirmed an extensive radiolucency located in the left sinus. The histology report gave evidence of an inflammatory dentigerous cyst. The cyst was treated by marsupialization at the department of maxillofacial surgery. After healing we started orthodontic treatment and finished with satisfactory results.

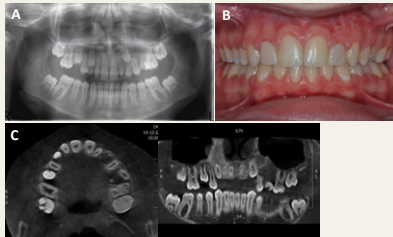


Fig 3. Boy with cystic structure in maxillary sinus after marsupialization. A: panoramic radiograph 9/12/2009. B: CBCT 16/12/2009.

In the second case the CBCT showed a substantial radiolucency, located in the right mandibular ramus. Histology revealed a giant cell reaction on the follicle of the lower right third molar. Treatment consisted of marsupialization with frequent recalls.

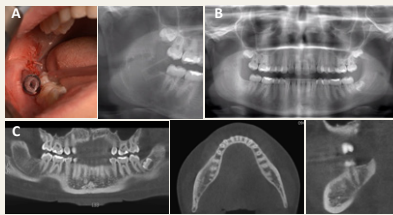


Fig 3. A: marsupialization of the inflammation at the retromolar space 10/06/2013. B: panoramic radiograph after healing 6-5-2014. C: CBCT after healing 6-5-2014.

## CONCLUSION

The use of radiographs, especially panoramic radiographs, in the orthodontic practice is of great importance in the diagnosis of bone pathology without any clinical symptoms.

## CORRESPONDING AUTHOR

Prof. Dr. G. Willems, Dept of Oral Health Sciences - Orthodontics, KU Leuven & Dentistry, UZ Leuven, Kapucijnenvoer 7, B-3000 Leuven, Belgium, guy.willems@uzleuven.be

Morphological variability of the human mandible canal:  
A cone-beam computed tomography evaluationLivia Corpas<sup>1</sup>, Yan Huang<sup>1</sup>, Bassant Mowafey<sup>1,5</sup>, Patrick Semal<sup>2</sup>, Xin Liang<sup>3</sup>, Ivo Lambrechts<sup>4</sup>, Constantinus Politis<sup>1</sup>, Reinhilde Jacobs<sup>1,\*</sup><sup>1</sup> OMFS IMPATH research group, Dept. Imaging & Pathology, Faculty of Medicine, KU Leuven and Oral and Maxillofacial Surgery, University Hospitals Leuven, Belgium.<sup>2</sup> Department of Paleontology, Royal Belgian Institute of Natural Sciences, Belgium.<sup>3</sup> Dalian Medical University, China.<sup>4</sup> Biomedical Research Institute, Laboratory of Morphology, Hasselt University, Campus Diepenbeek, Belgium.<sup>5</sup> Periodontology, Oral Medicine, Diagnosis and Oral Radiology Department, Faculty of Dentistry, Mansoura University, Egypt.

## ABSTRACT

- **Objective:** To evaluate regional variability in neurovascular structures of human mandibles from different geographical origins.
- **Materials & methods:** The anatomical variability of neurovascular canals and their relation to the tooth roots of 96 human mandibles deriving from different geographic regions. They were collected and analysed using CBCT.
- **Results:** Geographical analyses indicated that the neurovascular mandibular canals and the distance to tooth roots vary significantly amongst geographical areas. Discriminant analysis showed that Greenlandic mandibles could be differentiated from other geographically distributed human mandibles, while Brazilian and Belgian mandibles showed no distribution overlapping with Indian and Congolese mandibles.
- **Conclusions:** Specific neurovascular canal features may characterize specific geographic populations, which would assist in determining geographical origin of unidentified human beings, and in preventing the potential surgical and pathological risks.

## INTRODUCTION

►Mandibular anatomy has been extensively revisited by means of advanced imaging technologies such as Cone Beam Computed Tomography (CBCT). This image technique generates high quality image with a 3D visualization leading to a more complete set of anatomical information.

►Mandibular canal anatomy has been revisited by CBCT imaging with a focus on the mental foramen, mandibular canal, incisive canal, lingual canal, and other less frequently observed anatomical variations.

►The present study was aimed to evaluate mandibular neurovascular structures in mandibles of different geographical locations as it is assumed that a large variability exists.

## MATERIALS

►Ninety-six radiological images of mandibles belonging to adult humans from 7 geographical locations, corresponding to 4 continents, namely Africa, America, Asia and Europe, were used to assess geographical variability. Samples derived from Belgium (n=21), Brazil (n=20), China (n=8), Congo (n=8), Greenland (n=5), India (n=27) and Indonesia (n=7).

►CBCT images were taken for the mandibular of Brazilian and Belgian populations for the treatment planning. The remaining mandibular datasets consisted of dry adult mandibles were provided by the Royal Belgian Institute of Natural Sciences (Brussels, Belgium), which included mandibles from 5 other geographical locations (China, Congo, Greenland, India and Indonesia).

## METHODS

Fig 1 Cross-sectional images of mandibular canal at molar (A) and premolar (B) regions and of mental foramen (C). The first image at left (A) shows the measurements conducted at molar region, RL 38: root length 38; DA38: distance canal to root apex 38; MC38: mandibular canal diameter at molar region. The image (B) shows the measurements conducted at premolar region, RL 35: root length 35; DA35: distance canal to root apex 35; MC35: mandibular canal diameter at molar region. Image (C) shows a cross-sectional image of mental foramen (MF).

Fig. 1

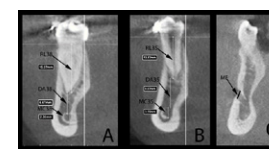


Fig. 2

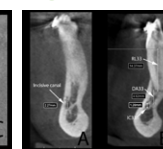
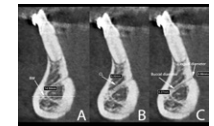


Fig 2. Image (A) shows the cross-sectional view of incisive canal at its start point and image (B) shows the cross-sectional view of the incisive canal below the canine tooth (IC33). The root length of the canine (RL33) and the distance canal to root apex (DA33) were measured.

Fig 3. Cross-sectional views from the lingual canal. Images (A), (B) and (C) show the measurement of bone width (BW), canal length (CL) and lingual canal diameter (buccal and lingual), respectively.

Fig. 3



## RESULTS

Table 1. Geographical variation of the horizontal and vertical position of the midline and lateral lingual canals, and occurrence of canals.

Group	Sample size	Total lingual canals	Horizontal location lingual canals			Vertical location lingual canals		
			LEFT	MIDLINE	RIGHT	LOWER	MIDDLE	UPPER
Belgian	21	32	4	25	3	8	6	18
Brazilian	20	38	6	29	3	18	4	16
Chinese	8	16	3	12	1	9	1	6
Congolese	8	19	5	10	4	7	1	11
Greenlandian	5	14	3	9	2	8	4	2
Indian	27	47	7	34	6	15	19	13
Indonesian	7	28	10	13	5	15	10	3
Total	96	194	38	132	24	80	45	69

Table 2. Geographical trends and surgical risk prediction based on study observations.

Features related to surgical risks	Brazilian	Belgian	Chinese	Indian	Indonesian	Congolese
Large canals	X (incisive) X (mandibular) X (mandibular)					
Long roots	X				X	X
Large mental foramen		X				
Small distances root to canal		X			X	X
Bifid canal	X	X		X		
Anterior loop	X		X	X		

## CONCLUSIONS

►The mandibular canal and its branches as well as the distance to the tooth roots may vary significantly amongst geographical areas.

►The present study could identify specific neurovascular canal features as the characteristics of specific geographic populations. The latter might be important in the diagnostic and presurgical assessment, such as to encounter potential surgical and pathological risks.





KU LEUVEN

## Comparison between 2D and 3D facial images for forensic identification

Irem Ayaz<sup>1\*</sup>, Eman Shaheen<sup>1</sup>, Giulia Gallo<sup>1</sup>, Constantinus Politis<sup>1</sup>, Reinhilde Jacobs<sup>1,2</sup><sup>1</sup>OMFS IMPATH research group, Dept. Imaging & Pathology, Faculty of Medicine, KU Leuven and Oral and Maxillofacial Surgery, University Hospitals Leuven, Leuven, Belgium<sup>2</sup>Dept. Dental Medicine, Karolinska Institutet, Stockholm, Sweden

### Introduction

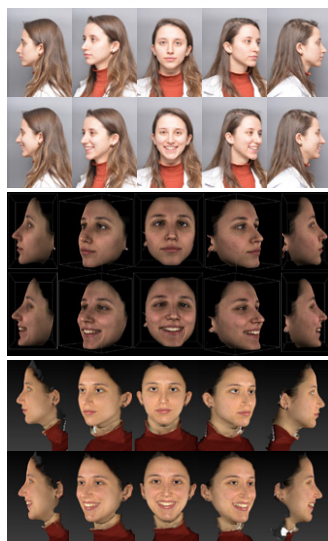
3D face scanning technology provides a realistic representation of the patient's face allowing analysis of maxillofacial deformities while it is non-invasive and non-ionizing. Moreover, it brings new opportunities for forensic identification increasing the reliability of identification by increasing the quality of images.

### Purpose

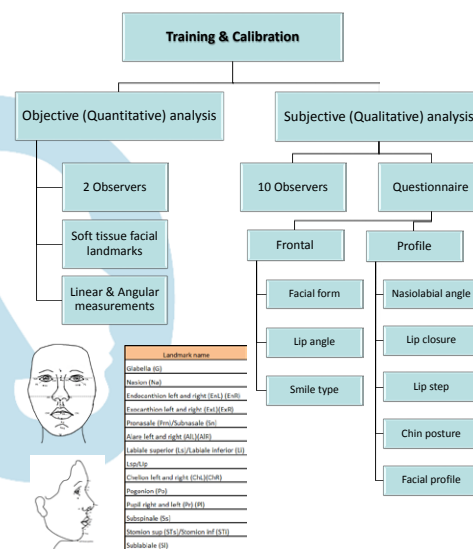
To comparatively assess and validate the accuracy of 3D and 2D facial imaging.

### Materials

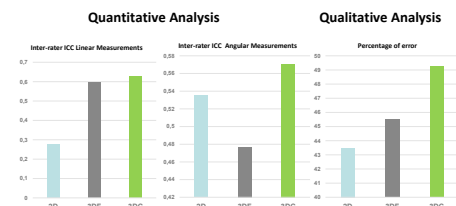
Imaging method	Subjects
2D clinical picture (2D)	Nikon camera
3D facial scan (3DF)	ProMax 3D max (Planmeca)
3D clinical picture (3DC)	Vectra H1 (Canfield Scientific)



### Methods



### Results



### Conclusion

In conclusion, this work sets the basis for accuracy assessment and a further evaluation of 3D clinical imaging for its use in forensic dentistry.

\*Corresponding Author Irem Ayaz [dt.iremayaz@gmail.com](mailto:dt.iremayaz@gmail.com)

## Persistent benefit of platelet-rich plasma on trabecular architecture: a three-dimensional micro-computed tomographic study at 6-month follow-up

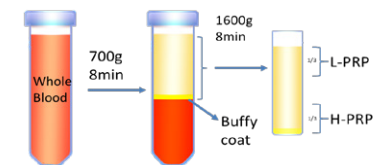
Yan Huang<sup>1,2</sup>, Zhaokai Li<sup>3</sup>, Jeroen Van Dessel<sup>1</sup>, Benjamin Salmon<sup>4</sup>, Bo Huang<sup>5</sup>, Ivo Lambrichts<sup>6</sup>, Constantinus Politis<sup>1</sup>, Reinhilde Jacobs<sup>1,7</sup><sup>1</sup>OMFS IMPATH research group, Dept. Imaging & Pathology, Faculty of Medicine, KU Leuven and Oral and Maxillofacial Surgery, University Hospitals Leuven, Leuven, Belgium; <sup>2</sup>State Key Laboratory of Oral Diseases, West China College of Stomatology, Sichuan University, Chengdu, China; <sup>3</sup>Dept. Clinical Medicine, Xiang Ya School of Medicine, Central South University, Changsha, Hunan, China; <sup>4</sup>Imaging & Oral Surgery, Paris Descartes Sorbonne University, Paris, France; <sup>5</sup>Implant Center, West China College of Stomatology, Sichuan University, Chengdu, China; <sup>6</sup>Group of Morphology, Biomedical Research Institute, Hasselt University, Diepenbeek, Belgium; <sup>7</sup>Dept. Dental Medicine, Karolinska Institutet, Stockholm, Sweden

### Aims

The influence of autologous platelet-rich plasma (PRP) on the assumed development of peri-implant bone structures has hardly been explored. The aim is to evaluate the peri-implant trabecular bone changes after the local application of a different concentration of PRP by high resolution micro-CT.

### Experiment design

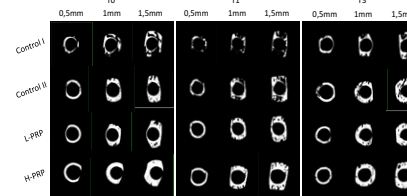
Nine beagle dogs randomly received 8 commercial threaded titanium implants (BLB system) at both sides of mandibular premolar regions from one out of 4 groups: delayed implant placement without any loading (control I); delayed implant placement with delayed loading (control II); low concentration of PRP + delayed implant placement with delayed loading (L-PRP); high concentration of PRP + delayed implant placement with delayed loading (H-PRP). Animals were euthanized at 1, 3 and 6 months afterwards, respectively.



**Figure 1:** PRP preparation. According to a double-centrifugation protocol, fresh whole blood (5ml) was drawn from the dogs before the breakfast and then centrifuged at 700g for 8min, resulting in three basic components: blood cells (bottom), buffer coat (middle) and plasma (top). Next, the supernatant plasma and buffy coat were collected for further preparation. Both components were centrifuged separately for a second time at 1600g for 8min.

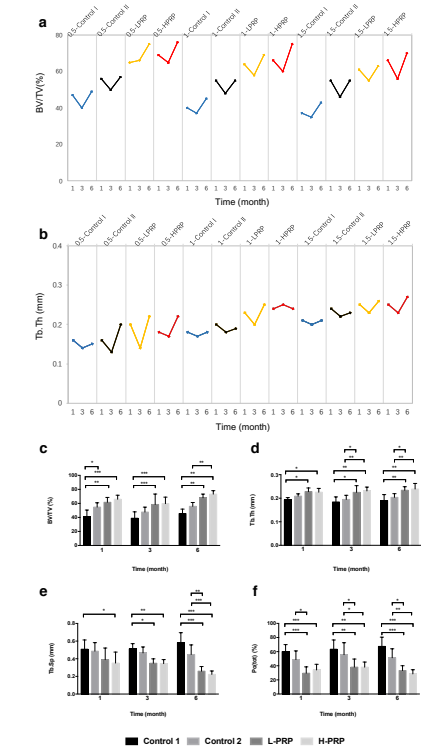
### Bone structure morphometry

The block biopsies were scanned under a resolution of 20 µm, 10 x 10 mm FOV by micro-CT (Caliper, USA). The bone structural parameters were calculated in three circular-shaped region (0.5, 1 and 1.5 mm W x 2mm H) around the middle level of implant. The bone structural parameters were calculated used a custom-made dedicated tool in CTAN software (Bruker, Kontich, Belgium) <sup>1,2</sup>.



**Figure 2:** 3D morphometric analyses based on binary segmentation of trabecular bone for different time points.

### Results



**Figure 3:** The bone structure parameters change accordingly with the distance from the implant (a, b). Comparison of 3D morphometric parameters (1mm of ROI around implants). The micromorphology of the trabecular bone in L-PRP and H-PRP groups were characterized by relatively high values in BV/TV (c) and Tb.Th (d) but a lower value in Tb.Sp (e) and Po (tot) (f) in each observation time point. The micromorphology in the L-PRP group was similar to that of the H-PRP group at all observation time points. \*\*, \*\*\* significant differences ( $p < 0.05$ ,  $p < 0.001$  and  $p < 0.0001$ , respectively).

### References:

- Huang, Y., Van Dessel, J., Depyere, M., et al. (2014). Validating cone-beam computed tomography for peri-implant bone morphometric analysis. Bone Research.
- Huang, Y., Van Dessel, J., Liang, X., et al. (2014). Effects of immediate and delayed loading on peri-implant trabecular structures: a cone-beam CT evaluation. Clinical Implant Dentistry and Related Research.

Contact: [yan.huang@kuleuven.be](mailto:yan.huang@kuleuven.be)

Departmental Day, Leuven, Belgium, 26 October 2017

KU LEUVEN

GROUP BIOMEDICAL SCIENCES  
DEPARTMENT OF IMAGING & PATHOLOGY  
O&N 1 – BOX 505  
HERESTRAAT 49  
3000 LEUVEN, BELGIUM

## 3D LAB MKA

### OMFS-IMPATh

(Oral & MaxilloFacial Surgery – Imaging & Pathology)



Departmental Day, Leuven, Belgium, 26 October 2017

KU LEUVEN

GROUP BIOMEDICAL SCIENCES  
DEPARTMENT OF IMAGING & PATHOLOGY  
O&N 1 – BOX 505  
HERESTRAAT 49  
3000 LEUVEN, BELGIUM



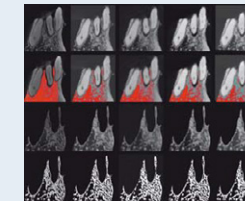
## OMFS-IMPATh

Oral and MaxilloFacial Surgery – Imaging & Pathology

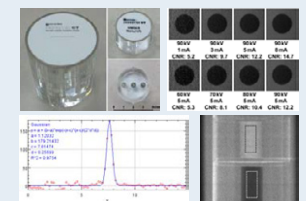
### RESEARCH ACTIVITIES



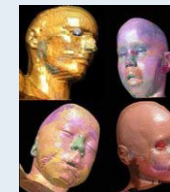
Trigeminal  
nerve injuries



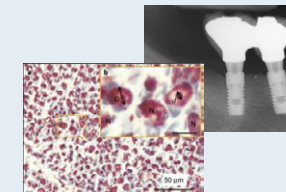
Bone quality  
assessment



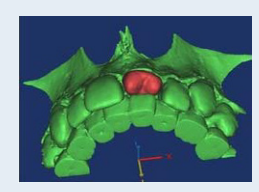
CBCT  
optimization



Radiation dose  
simulation



Innervation  
around implants



Tooth  
autotransplantation

### CONTACT

Prof. Dr. Constantinus Politis, constantinus.politis@uzleuven.be  
Prof. Dr. Reinhilde Jacobs, reinhilde.jacobs@uzleuven.be  
<http://www.omfsimpath.be>

## B. INVITED LECTURES

09-01-17	R. Jacobs	Two days course for radioprotection certification in dentistry	LUTV Leuven, Belgium
03-02-17	M. Vranckx	M3-observatorium preliminary results	VVMKA Upgrade, Lommel, Belgium
04-02-17	C. Politis	Relatie arts-zorgverzekeraar	VVMKA Upgrade, Lommel, Belgium
07-02-17	C. Politis	Extracties onder lokale anesthesie: durven en doen	NIVVT, Brussel, Belgium
08-02-17	R. Jacobs	How can image processing help dental research forward?	Karolinska University, Stockholm, Sweden
09-02-17	C. Politis	Do We Get What We Plan in the Vertical Plane in Orthognathic Surgery	15 th International Congress of the Iranian Society of Oral & Maxillofacial surgery, Tehran, Iran
09-02-17	C. Politis	Brainlab Navigation in Orthognathic Surgery	15 th International Congress of the Iranian Society of Oral & Maxillofacial surgery, Tehran, Iran
09-02-17	C. Politis	Condylar remodeling vs. condylar resorption	15 th International Congress of the Iranian Society of Oral & Maxillofacial surgery, Tehran, Iran
14-02-17	C. Politis	Extracties onder lokale anesthesie: durven en doen	NIVVT, Brugge, Belgium
15-02-17	R. Jacobs	Beyond CBCT: the era of 3D printing	Karolinska University, Stockholm, Sweden
23-02-17	R. Jacobs	What are the benefits of modern low dose CBCT protocols?	Symposium für Radiologie und Stomatologie, Bern, Switzerland
03-03-17	R. Jacobs	Diagnostiek in de kliniek	NVDMFR, Amsterdam, the Netherlands
03-03-17	R. Jacobs	Orale beeldvorming in de tandheelkunde	Oprichtingssymposium NVDMFR, Amsterdam, the Netherlands
08-03-17	C. Politis	Medische trends en toepasbaarheid rond inzet 3D - 4D printing	MIT-club SEMINAR, Materialise, Leuven, Belgium
08-03-17	C. Politis	3D planning- 3D/(4D) printing	MIT-club Materialize, Leuven, Belgium
05-04-17	R. Pauwels	Academic writing: tips from an author, reviewer and editor	School of Odontology of Piracicaba, University of Campinas, Brazil
07-04-17	R. Pauwels	Cone-beam CT: state of the art and future prospects	School of Odontology of Piracicaba, University of Campinas, Brazil
07-04-17	R. Pauwels	(R)evolution in clinical bone assessment using high-resolution 3D imaging	School of Odontology of Piracicaba, University of Campinas, Brazil
07-04-17	R. Pauwels	Radiation Protection in Dental Radiology: General Principles of Radiation Protection	School of Odontology of Piracicaba, University of Campinas, Brazil
18-04-17	C. Politis	Lokale anesthesie in de tandheelkunde	NIVVT, Lokeren, Belgium

24-04-17	R. Pauwels	How has dental cone beam CT impacted dental imaging practice and patient doses? International Conference on Radiation Protection in Medicine: Achieving Change in Practice	International Atomic Energy Agency (IAEA), 2017, Vienna, Austria
26-04-17	R. Jacobs	From the Virtual Patient to 3D bioprinting: the Era Beyond CBCT	IADMFR 2017, Kaohsiung, Taiwan
28-04-17	C. Politis	Do short implants work in the long run	International Academy of Oral and Facial Rehabilitation IAOFR, Manchester, UK
02-05-17	C. Politis	Extracties in de algemene praktijk	VVT Roeselare, Belgium
02-05-17	R. Jacobs	Curriculum Digital Dentistry	5th International Implantology days in Baden Baden, Germany
02-05-17	R. Jacobs	Image Collecting, Diagnosis with Cone Beam CT	Dental (R)evolution, Baden-Baden, Germany
05-05-17	R. Jacobs	Introduction to OMFS-IMPACT and its research activities	FANC, Brussel, Belgium
10-05-17	C. Politis	Basics of intra-operative navigation in orthognathic surgery	AOCMF European Forum and AOCMF Advanced Orthognathic Course, Leiden, the Netherlands
11-05-17	C. Politis	Computer-aided design and production of splints in orthognathic surgery	AOCMF European Forum and AOCMF Advanced Orthognathic Course, Leiden, the Netherlands
23-05-17	R. Jacobs	Open project for European Radioation Research Area	Budapest, Hungary
01-06-17	R. Jacobs	2 days inter-university programme on the use of cone beam CT for dentomaxillofacial diagnostics	LUTV Leuven, Belgium
07-06-17	C. Politis	Chirurgische mogelijkheden en valkuilen van het BICON-implantaat	Tandartsengroep, Aalter, Belgium
16-06-17	R. Jacobs	Straumann chair for Oral and Maxillofacial Surgery	UZ Leuven, Belgium
03-07-17	R. Jacobs	Workshop cone beam CT in de praktijk: basis Workshop cone beam CT in de praktijk: diagnostiek	LUTV Leuven, Belgium
04-08-17	C. Politis	Dermatologie in stomatologie	Stafvergadering Krans Dermatologie UZLeuven, Leuven, Belgium
04-08-17	C. Politis	Inflammatoire mucosa-aandoeningen van de mond	Staf en ASO's Dienst Dermatologie UZL-KUL, Leuven, Belgium
21-08-17	C. Politis	Complications after orthognathic surgery: prevention + treatment	9th's People Hospital Shanghai, China
22-08-17	C. Politis	Digital Planning with Proplan	9th's People Hospital Shanghai, China

22-08-17	R. Pauwels	Radiation Protection in Dental Radiology: Current Status	9th Iranian Oral and Maxillofacial Radiology Congress Teheran, Iran
22-08-17	R. Pauwels	HU in CBCT: (un)reliability, clinical applicability and future prospects	9th Iranian Oral and Maxillofacial Radiology Congress Teheran, Iran
26-08-17	C. Politis	Complications in the lower jaw after orthognathic surgery	9th's People Hospital Shanghai, China
02-09-17	C. Politis	Beperkte mondopenin	LUTV Leuven, Belgium
04-09-17	R. Jacobs	Two days course for radioprotection certification in dentistry	LUTV Leuven, Belgium
07-09-17	R. Jacobs	Workshop cone beam CT in de praktijk: presentatie van eigen casus	LUTV Leuven, Belgium
14-09-17	R. Jacobs	CBCT's bekijken om een diagnose te stellen: hoe beginnen we eraan?	LUTV Leuven, Belgium
15-09-17	R. Jacobs	La radioprotection pratiquée dans le cabinet dentaire	Chambre Syndical Dentaire, Bruxelles, Belgium
15-09-17	R. Jacobs	De la 2 D à la 3 D: indications et résultats du diagnostic	Chambre Syndical Dentaire, Bruxelles, Belgium
19-09-17	C. Politis	Lokale anesthesie in de tandheelkunde	NIVVT, Antwerpen, Belgium
23-09-17	C. Politis	Maxillo-mandibular advancement for treatment of obstructive sleep apnea: review of the literature with emphasis on long-term results	NIVVT, Knokke, Belgium
30-09-17	R. Jacobs C. Politis	The future of OMFS	LUTV Leuven, Belgium
06-10-17	R. Jacobs	CBCT Indications and Limits of the use in dental office	Digital Dentistry Society, Lyon, France
06-10-17	R. Jacobs	Le cone beam: ses indications et ses limiats au cabinet dentaire	Digital Dentistry Society, Lyon, France
12-10-17	R. Jacobs	Beyond dentomaxillofacial CBCT: virtual patients & 3D bioprinting	3D printing & bio-printing in Healthcare Conference, Düsseldorf, Germany
14-10-17	C. Politis	Propedeutiek van speekselklierklachten - Prof. Dr. C. Politis	LUTV Leuven, Belgium
14-10-17	C. Politis	Speekselklierafwijkingen	LUTV Leuven, Belgium
14-10-17	E. Shaheen	Semi-automatic forensic approach using mandibular lingual canals as fingerprint	Triennial IOFOS Conference Forensic Odontology, Leuven, Belgium
17-10-17	C. Politis	Extracties in de algemene praktijk	Oostende Tandheelkundige Kring, Ostend, Belgium
21-10-17	R. Jacobs	From ALARA to patient - specific and indication - oriented imaging	4° congreso de odontologia minimamente invasiva, Madrid, Spain
26-10-17	M. Ezeldeen	The virtual patient	ON1 Gasthuisberg, Leuven, Belgium

10-11-17	R. Jacobs	3D CBCT van beeld tot print.	Diagnostic tools in periodontology & oral implantology revisited, Ghent, Belgium
14-11-17	C. Politis	Lokale anesthesie in de tandheelkunde	NIVVT, Genk, Belgium
15-11-17	A. Stratis	Assessing radiation dose on MDCT and CBCT imaging. Eutempe RX- Module 6: The development of advanced QA protocols for testing radiological devices.	KU Leuven, Leuven, Belgium
16-11-17	R. Jacobs	Use of CBCT versus other imaging modalities to predict or assess perimplant complications	FOR, Leuven, Belgium
30-11-17	R. Jacobs	Cone Beam CT voor gevorderden	UZ Leuven, Belgium
02-12-2017	C. Politis	Zwellingen	LUTV Leuven, Belgium
07-12-17	A.Stratis	Cone beam dentale CT bij kinderen. PATIËNTENDOSIMETRIE IN CT-BEELDVOORMING.	Pentalfa sessions on Radiation Protection, KU Leuven, Leuven, Belgium
16-12-17	C. Politis	Iatrogene problematiek: update bone modifying anchors, chemotherapie en bestraling	LUTV Leuven, Belgium
20-12-17	R. Jacobs	Tandautotransplantatie in Leuven	20 years Maxillofacial Imaging, Gasthuisberg, Leuven, Belgium
21-12-17	R. Jacobs C. Politis	Imagination - Symposium n.a.v. 20 jaar dentomaxillofaciale beeldvorming	LUTV Leuven, Belgium

# 5

## 3D lab



**A. TEAM****B. PROJECTS****C. PUBLICATIONS**

- International Peer Reviewed Publications
- Oral presentations
- Poster presentations
- invited lectures

The 3D lab facility was officially introduced in autumn 2014, as an integrated part of the Department of Oral and Maxillofacial surgery at UZ Leuven. Together with the maxillofacial imaging center, the 3D-lab facility is fully integrated in the workflow of the daily clinic. The work started from simple segmentation and 3D printing of anatomical structures to 3D planning of complex surgeries. Currently, the 3D lab works in a multidisciplinary team that brings together the expertise of doctors, scientists, engineers to improve care for each individual patient. This closed cooperation enabled the surgeon and patient to maximize the benefits from 3D technology. The focus of our 3D lab is how to integrate 3D technologies in the clinical workflow to develop new medical treatment methods and to carry out clinical research in the field of oral and maxillofacial surgery. This involves computer assisted surgical planning, 3D printing of anatomic models and surgical templates, 3D metal printing of patient specific implant and image-guided surgery.

Besides Oral and Maxillofacial surgery, the 3D lab is collaborating internally within UZ Leuven departments, and externally with 9th People Hospital Shanghai, 4th Military Medical University Xi'an China, Department of Mechanical Engineering Jiao Tong University, Karolinska University Hospital Stockholm, etc.



## A. TEAM

*Constantinus POLITIS*

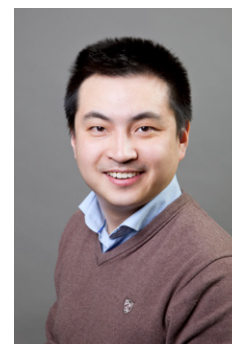
Constantinus Politis is Oral and Maxillo-Facial Surgeon. He is currently Full Professor and Chairperson of the Department of Oral and Maxillofacial Surgery at Leuven University, KU Leuven, Belgium. He is an invited Lecturer at the EHSAL in Brussels. He graduated at the Catholic University of Leuven in medicine (MD, summa cum laude), in dentistry (DDS, magna cum laude). He specialized in oral and maxillofacial surgery at the Catholic University of Leuven. Postgraduate training was additionally followed in Arnhem (Stoelinga), Aachen (Koberg), Copenhagen (Pindborg), Göteborg (Bränemark) and San Francisco (Marx). He also holds a master degree in management (MM) from the Applied Economic Sciences at the University of Hasselt and a master degree in Hospital Management (MHM) from the Catholic University of Leuven. He became a recognition as medical specialist in management of health care data and is now member of the National Council of Hospital Facilities. He is Secretary General of the Professional Union of Belgian Oral and Maxillofacial Surgeons. He is acknowledged trainer of OMFS trainees. He defended his doctor's thesis on the subject of complications of orthognathic surgery (PhD). His professional field of interest is in orthognathic and orthodontic surgery and trigeminal nerve dysfunction. Clinical research projects include prevention and repair of iatrogenic trigeminal nerve injury, transplantation of teeth and orthognathic surgery. He is member of the Belgian Royal Academy of Medicine.

*Reinhilde JACOBS*

Reinhilde Jacobs is dentist (1990), Doctor in Dental Sciences (1993; PhD University of Leuven), periodontologist (1996; KU Leuven) and Master in Dental Radiology (2002; University of London). With a European fellowship (1994-1995), she performed postdoctoral research at the Dept Orthopaedics (prof B Rydevik, Salghrenska Sjukhuset, Göteborg) and at the Institute of Applied Biotechnology (prof P-I Brånemark), University of Gothenburg, Sweden. She is full professor at the University of Leuven, visiting professor at Karolinska Institutet Stockholm (Sweden) and Dalian Medical University in China. R. Jacobs is coordinating the OMFS-IMPACT Research Group ([www.omfsimpath.be](http://www.omfsimpath.be)) of the Department of Imaging & Pathology, meanwhile being responsible for research, education and clinical activities in dentomaxillofacial radiology (heading the dentomaxillofacial radiology center). She is Secretary General of the International Association of DentoMaxilloFacial Radiology and past president of the European Academy of DentoMaxilloFacial Radiology. She is section editor imaging of Clinical Oral Investigations and associate editor of European Journal of Oral Implantology, and Oral Radiology. She has received the D Collen Research Travel Award (1994), the IADR Young Investigators Award (1998) and the Belgian Joachim Award in the Odontostomatology (1999). In 2013, she received a Dr Honoris Causa at the "Iuliu Hatieganu" University of Medicine and Pharmacy in Cluj-Napoca. She is involved in many multidisciplinary and interuniversity research collaborations, with a specific focus on oral implant physiology and imaging research. She has been actively participating in European projects (ref. Pisa, Minosquare, Osteodent, SedentexCT and Dimitra). She is (co) author of 5 books and more than 350 publications in peer-reviewed journals besides multiple invited lectures and publications in other journals or books.

*Eman SHAHEEN*

Eman (Emmy) Shaheen was born on July 12th, 1982 in Giza, Egypt. She graduated with honor from the faculty of Computer Sciences and Information Technology (2003), Cairo University, Egypt where she also worked as a teaching assistant from 2003 till 2007 with major in Image Processing. Meanwhile, she obtained her Master's Degree in Video Processing (2007) from Cairo University. In 2008, she joined the team of Medical Physics where she finished with distinction her pre-doctoral studies about mammography and breast cancer (2009) in Biomedical Sciences at the KU Leuven, Belgium. She was granted a PhD scholarship from the OPTIMAM project (UK) in 2010 to develop, simulate and validate 3D models of breast lesions and tools to optimize the performance of breast tomosynthesis. She obtained her doctoral degree in 2014, KU Leuven, Belgium. In the same year, she started working in the department of Maxillo-facial surgery, University hospitals Leuven (Belgium) with Prof. Constantinus Politis as clinical engineer with focus on 3D planning of orthognathic surgeries. Next to the patient related work, she is the lead engineer of the research group of the OMFS-IMPACT (KU Leuven, Belgium) where she supervises students, supports different research projects related to 3D printing and 3D simulations. She is also collaborating with Materialise (Leuven, Belgium) as consultant to improve the CMF software for orthognathic surgeries next to other research related projects.

*Yi SUN*

Yi Sun obtained his PhD in Biomedical Science, Master of Medical imaging and Bachelor in electronic engineering in China. Since 2007, he worked in the field of computer assistant surgery planning, with focus on oral and maxillofacial surgery. His main professional interest is template-based and image-guided solution for dental implant placement, design of digital splint for orthognathic surgery, mandible reconstruction using fibular bone. Currently he is responsible for the 3D surgical simulation team in the department of oral and maxillofacial surgery (UZ Leuven) and involved in development of image-guided surgical system (navigation system).

## Sohaib SHUJAAT



Sohaib Shujaat was born on November 29th, 1985. He achieved his degree in Bachelor of Dental Surgery (B.D.S) from Lahore Medical and Dental College, Lahore, Pakistan (2004 - 2008). After his graduation, he worked as an Internee in all clinical departments of dentistry at Lahore Medical and Dental College, Lahore, Pakistan (2009-2010). He obtained his "Master of Science" (MSc. Dent Sci) degree in Oral and Maxillofacial Surgery (360 credits) with merit from Glasgow Dental School and Hospital, University of Glasgow, Glasgow, United Kingdom, under the guidance of Professor Ashraf Ayoub (2010-2012). During his Masters, he worked on 4-Dimensional facial soft tissue changes in oncology patients. From March 2013 till September 2017, he worked as a Lecturer in the Department of

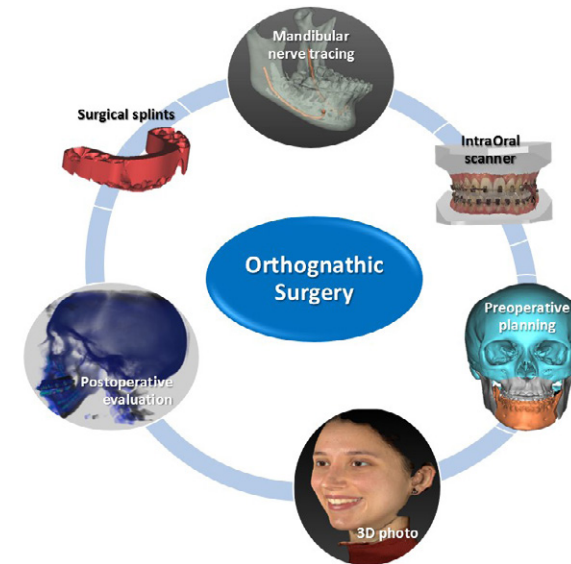
Oral and Maxillofacial Surgery and Course Director of Internal Medicine and Comprehensive Patient Management (CPM) for dental students at Imam AbdulRahman Bin Faisal University (Formerly University of Dammam), Dammam, Kingdom of Saudi Arabia. At the same instance, he served as a Specialist (Registrar) in the Department of Oral and Maxillofacial Surgery, King Fahd Hospital of the University. Currently he is a PhD candidate (OMFS- IMPATH, KU Leuven) with Professor Reinhilde Jacobs as his promotor. His research topic for PhD is related to three-dimensional analysis of hard and soft tissue changes in orthognathic surgery patients and to develop a start of art predictive model for treatment planning.

## B. PROJECTS

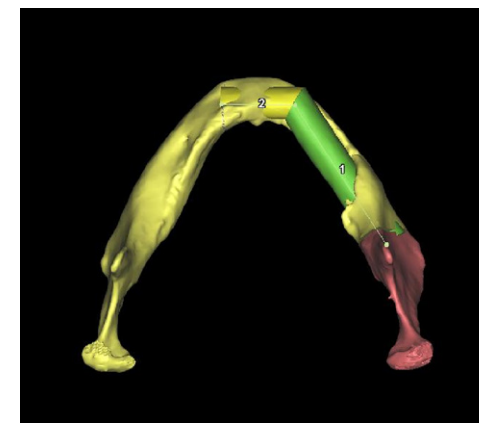
3D planning of orthognathic surgery

3D follow-up of hard and soft tissues of orthognathic patients (short and long term)

3D titanium printing of osteosynthesis plate for Le Fort I surgery



Computer assisted mandible / maxilla reconstruction with fibular or DCIA flap



## C. PUBLICATIONS

## INTERNATIONAL PEER-REVIEWED PUBLICATIONS

- Nicolielo L., Van Dessel J., Shaheen E., Letelier C., Codari M., Politis C., Lambrichts I., Jacobs R. (2017). Validation of a novel imaging approach using multi-slice CT and cone-beam CT to follow-up on condylar remodeling after bimaxillary surgery. *International Journal of Oral Science*, 9 (3), art.nr. 10.1038/ijos.2017.22, 139-144. (citations: 0) (most recent IF: 3.93).
- Stratis A., Zhang G., Lopez-Rendon X., Politis C., Hermans B., Jacobs R., Bogaerts R., Shaheen E., Bosmans H. (2017). Two examples of indication specific radiation dose calculations in dental CBCT and Multidetector CT scanners. *Physica Medica*, 41, art.nr. S1120-1797(17)30085-6, 71-77. (citations: 1) (most recent IF: 1.99).
- Storms A., Vansant L., Shaheen E., Coucke W., Cadenas de Llano Perula M., Jacobs R., Politis C., Willems G. (2017). Three-dimensional aesthetic assessment of class II patients before and after orthognathic surgery and its association with quantitative surgical changes. *International Journal of Oral & Maxillofacial Surgery*, 46 (12), art.nr. IJOM\_3745, 1664-1671. (citations: 0) (most recent IF: 1.92).
- Meewis J., Govaerts D., Falter B., Grisar K., Shaheen E., Van de Vyvere G., Politis C. (2017). Reaching the vertical versus horizontal target position in multi-segmental Le Fort I osteotomy is more difficult, but yields comparably stable results to one-segment osteotomy. *International Journal of Oral & Maxillofacial Surgery, Articles in Press*, art.nr. S0901-5027(17)31643-0 (most recent IF: 1.92).
- Shaheen E., Mowafey B., Politis C., Jacobs R. (2017). Semi-automatic forensic approach using mandibular midline lingual structures as fingerprint: a pilot study. *Journal of Forensic Odonto-Stomatology*, 35 (2), 41-47.
- Agbaje J., Castele E., Salem A., Anumendem D., Shaheen E., Sun Y., Politis C. (2017). Assessment of occlusion with the T-Scan system in patients undergoing orthognathic surgery. *Scientific Reports*, 7 (1), art.nr. 10.1038/s41598-017-05788-x, 5356. (citations: 0) (most recent IF: 4.26).
- Shaheen E., Khalil W., Ezeldeen M., Van de Castele E., Sun Y., Politis C., Jacobs R. (2017). Accuracy of segmentation of tooth structures using 3 different CBCT machines. *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, 123 (1), 123-128. (citations: 0) (most recent IF: 1.42).
- Gaber R., Shaheen E., Falter B., Araya S., Politis C., Swennen G., Jacobs R. (2017). A Systematic Review to Uncover a Universal Protocol for Accuracy Assessment of 3-Dimensional Virtually Planned Orthognathic Surgery. *Journal of Oral and Maxillofacial Surgery*, 75 (11), art.nr. S0278-2391(17)30602-X, 2430-2440. (citations: 0) (most recent IF: 1.92).
- Shaheen E., Sun Y., Jacobs R., Politis C. (2017). Three-dimensional printed final occlusal splint for orthognathic surgery: design and validation. *International Journal of Oral & Maxillofacial Surgery*, 46 (1), art.nr.S0901-5027(16)30275-2, 67-71. (citations: 0) (most recent IF: 1.92)
- Agbaje J., Sun Y., Salem A., Li Z., Politis C., Adu K. (2017). Achieved chin position after genioplasty follows the planned horizontal change better than the planned vertical change. *Journal of Cranio-maxillo-facial Surgery*, 45 (8), art.nr. S1010-5182(17)30196-8, 1287-1292. (citations: 0) (most recent IF: 1.58).
- Cockmartin L., Marshall N., Zhang G., Lemmens K., Shaheen E., Van Ongeval C., Fredenberg E., Dance D., Salvagnini E., Michielsen K., Bosmans H. (2017). Design and application of a structured phantom for detection performance comparison between breast tomosynthesis and digital mammography. *Physics in Medicine and Biology*, 62 (3), art.nr. 10.1088/1361-6560/aa5407, 758-780. (citations: 3) (most recent IF: 2.74).

## ORAL PRESENTATIONS

Shaheen E., Dormaar T., Coropciuc R., Schoenaers J., Jacobs R., Politis C. EVALUATING THE FEASIBILITY OF SOFTWARE TOOLS FOR VIRTUAL PLANNING OF FRACTURE MANAGEMENT. KBVSMFH meeting Brussels, Belgium, March, 18, 2017

Shaheen E., Mowafey B., Politis C., Jacobs R. SEMI-AUTOMATIC FORENSIC APPROACH USING MANDIBULAR LINGUAL CANALS AS FINGERPRINT. Triennial IOFOS Conference on Forensic Odontology Leuven, Belgium, September, 14, 2017

Sun Y., Shaheen E., Jacobs R., Politis C. ACCURACY OF LE FORT I SURGERY USING A CUSTOMIZED OSTEOSYNTHESIS PLATE. KBVSMFH meeting Brussels, Belgium, November, 18, 2017

Shaheen E., De Temmerman G., Falter B., Jacobs R., Politis C. ADVANCES IN 3D VIRTUAL PLANNING AND FOLLOW-UP OF ORTHOGNATHIC SURGERY. KBVSMFH meeting Brussels, Belgium, November, 18, 2017

Ayaz I., Shaheen E., Gallo G., Politis C., JACOBS R. VALIDATION OF 3D FACIAL IMAGING VS 2D CLINICAL IMAGING FOR CLINICAL ASSESSMENT DURING TREATMENT PLANNING AND FOLLOW-UP. KBVSMFH meeting Brussels, Belgium, November, 18, 2017

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## POSTER PRESENTATIONS

International Conference on Forensic Odontology. Leuven, Belgium,  
13-16 September 2017



KU LEUVEN

## Comparison between 2D and 3D facial images for forensic identification

Irem Ayaz<sup>1\*</sup>, Eman Shaheen<sup>1</sup>, Giulia Gallo<sup>1</sup>, Constantinus Politis<sup>1</sup>, Reinhilde Jacobs<sup>1,2</sup>

<sup>1</sup>OMFS IMPATH research group, Dept. Imaging & Pathology, Faculty of Medicine, KU Leuven and Oral and Maxillofacial Surgery, University Hospitals Leuven, Leuven, Belgium

<sup>2</sup>Dept. Dental Medicine, Karolinska Institutet, Stockholm, Sweden

### Introduction

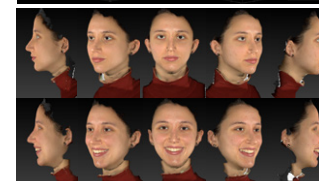
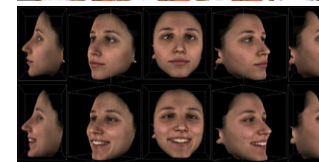
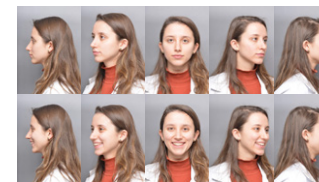
3D face scanning technology provides a realistic representation of the patient's face allowing analysis of maxillofacial deformities while it is non-invasive and non-ionizing. Moreover, it brings new opportunities for forensic identification increasing the reliability of identification by increasing the quality of images.

### Purpose

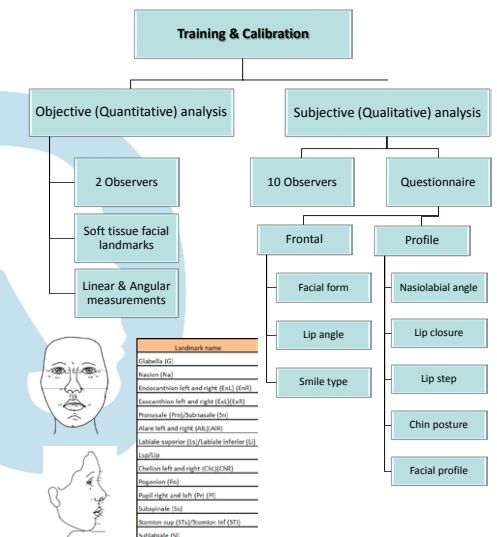
To comparatively assess and validate the accuracy of 3D and 2D facial imaging.

### Materials

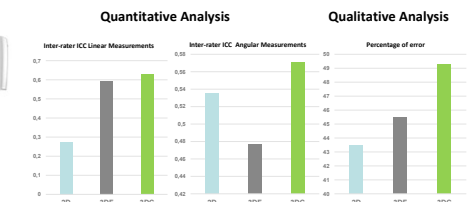
Imaging method		Subjects
2D clinical picture (2D)	Nikon camera	50
3D facial scan (3DF)	ProMax 3D max (Planmeca)	50
3D clinical picture (3DC)	Vectra H1 (Canfield Scientific)	50



### Methods



### Results



### Conclusion

In conclusion, this work sets the basis for accuracy assessment and a further evaluation of 3D clinical imaging for its use in forensic dentistry.

\*Corresponding Author Irem Ayaz [dt.iremayaz@gmail.com](mailto:dt.iremayaz@gmail.com)



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**KU LEUVEN**

GROUP BIOMEDICAL SCIENCES  
DEPARTMENT OF IMAGING & PATHOLOGY  
O&N 1 – BOX 505  
HERESTRAAT 49  
3000 LEUVEN, BELGIUM

## 3D LAB MKA OMFS-IMPATh

(Oral & MaxilloFacial Surgery – Imaging & Pathology)



### INVITED LECTURES

09-02-17	C. Politis	Do We Get What We Plan in the Vertical Plane in Orthognathic Surgery	15 th International Congress of the Iranian Society of Oral & Maxillofacial surgery, Tehran, Iran
09-02-17	C. Politis	Brainlab Navigation in Orthognathic Surgery	15 th International Congress of the Iranian Society of Oral & Maxillofacial surgery, Tehran, Iran
10-05-17	C. Politis	Basics of intra-operative navigation in orthognathic surgery	AOCMF European Forum and AOCMF Advanced Orthognathic Course, Leiden, the Netherlands
11-05-17	C. Politis	Computer-aided design and production of splints in orthognathic surgery	AOCMF European Forum and AOCMF Advanced Orthognathic Course, Leiden, the Netherlands
31-01-17	E. Shaheen B. Falter	3D virtual orthognathic surgery: planning and follow-up	3D Dental Printing Conference at MECC Maastricht, the Netherlands



Prof. Politis - Prof. Schoenaers - Prof. Bossuyt - Prof. Fossion



University of Leuven  
Department of Imaging & Pathology  
OMFS IMPATH Research Group  
Kapucijnenvoer 7 blok a - box 7001  
3000 Leuven  
BELGIUM  
+32 16 33 24 52  
+32 16 33 27 48  
[www.omfsimpath.be](http://www.omfsimpath.be)



