2022

ICDigest

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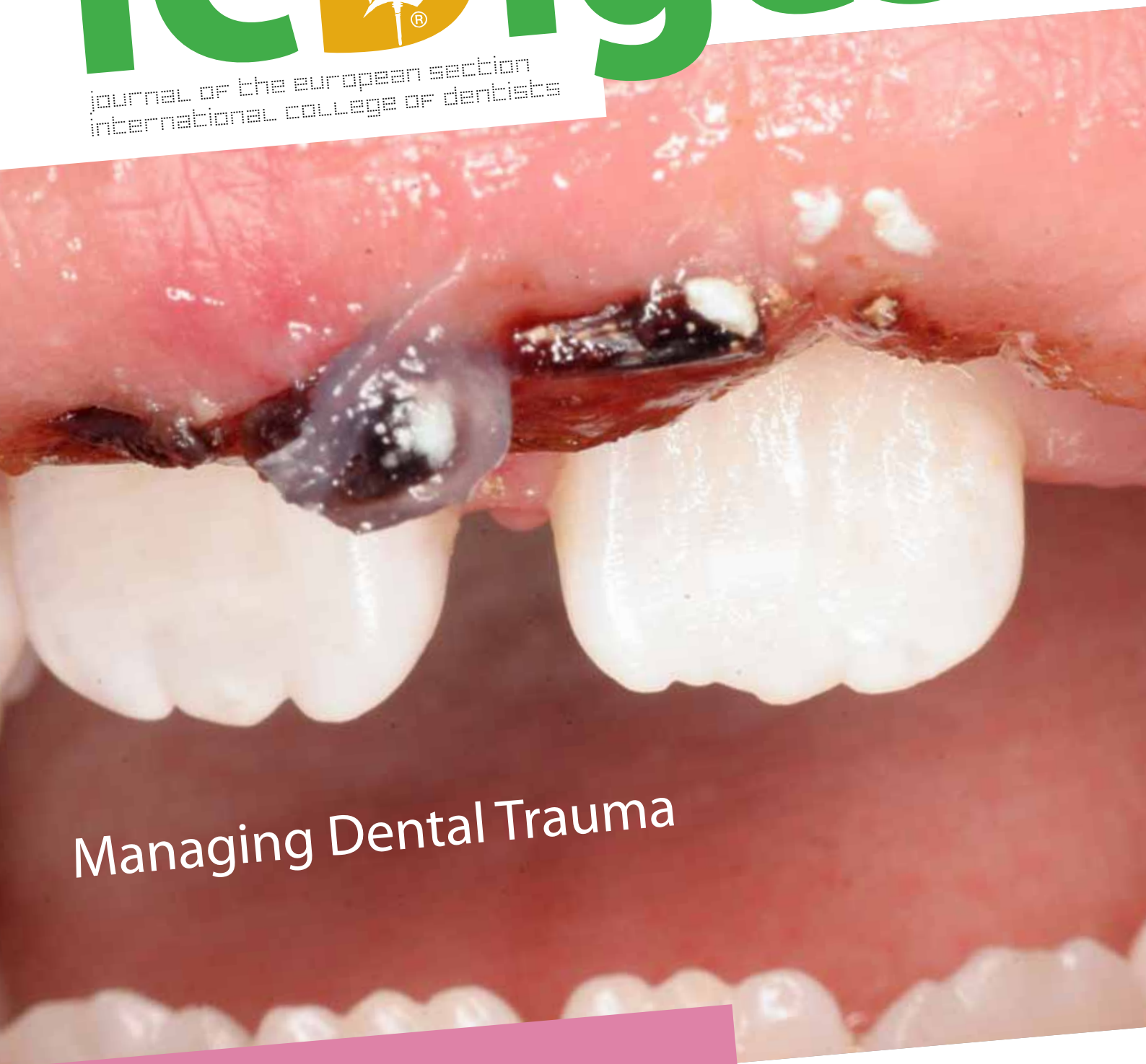

Managing Dental Trauma

Fellowship, Science, Humanitarism and Recognising Service

Dentistry 2022

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The International College of Dentists is the preeminent global dental honor society recognising outstanding professional achievement and meritorious service while advocating for humanitarian and educational initiatives.

Motto
Recognising service as well as the opportunity to serve.

Core Values
Leadership: Uphold the highest standard of professional competence and personal ethics.

Recognition: Recognise distinguished service to the profession and the public worldwide.

Humanitarianism: Foster measures for the prevention and treatment of oral disease by encouraging and supporting humanitarian projects.

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Provide a universal forum for the cultivation of cordial relations within the profession and to assist in preserving the highest perception of the profession worldwide.

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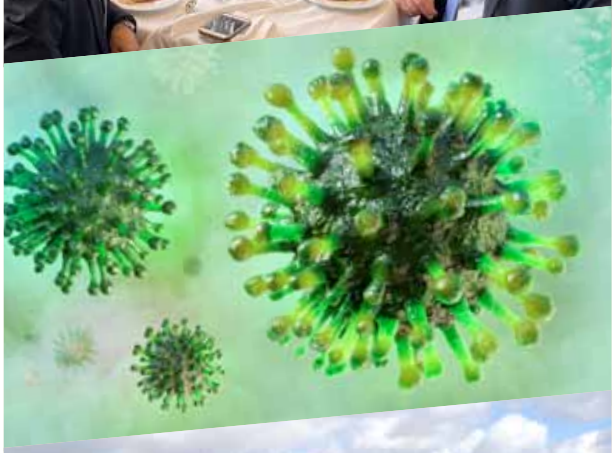

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WHO resolution on oral health

The recent WHO (World Health Organisation) resolution on oral health[1] has far reaching consequences. The resolution stemmed from recognition that more than 3.5 billion people suffer from oral diseases and, amongst other stark statistics, the annual, global, economic burden of the largely preventable oral and dental diseases is US$545 billion – one of the costliest health domains, comparable to diabetes and cardiovascular diseases.

Member states of the WHO have been urged to address, amongst other issues, key risk factors, the integration of oral health into national health policies, a shift to minimum intervention approaches to oral healthcare, the promotion of efficient workforce models, and the strengthening of oral health services as part of the essential health services package for universal health coverage. And, in addition, member states have been urged to raise stubbornly low levels of public awareness to the benefits of a functional dentition and oral health throughout life.

In the meantime, the WHO has been tasked to draft a global strategy to tackle oral diseases by 2022, with a view to translating this strategy into an action plan by 2023. This action plan, which should "leave no one behind" (I.e., not exacerbate already unacceptable oral health inequalities) and fully utilise modern digital technologies, specifically in the field of telehealthcare, is required to be environmentally friendly and develop "best buy" minimum interventions, including supportive preventative programmes. No small challenge!

If all of the above is achieved in the incredibly tight timeframe, dentistry, specifically state-funded dentistry could face rapid, dramatic transformative change across the world. Will the strategy and action plan have the support of professional associations? Will the necessary funding be made available? Will dental teams, recovering from the bruising experience of the COVID-19 pandemic, have the will and capacity to reinvent their services and approach, and do it quickly? Can public awareness be raised to the desired level? These are 'big' questions. In the interests of those suffering the effects of high levels of dental disease and oral health inequalities, it is hoped that there will be 'big answers' to help achieve the laudable goals of the resolution.

As recognised leaders, ICD Fellows, individually and collectively, can help drive the WHO's ambitious agenda, possibly focussing on one element of the action plan, be it, for example, becoming more environmentally friendly practitioners, or supporting transformative humanitarian programmes. Every positive action, however small, will help diminish the enormity of the global challenge and lead to positive change. The bigger the part ICD Fellows play in affecting the desired changes, the greater the standing and status of the College in the future.

So, in adapting to the 'new norm' the other side of the pandemic, Fellows are encouraged to consider positive actions, however small and apparently inconsequential, to modernise their clinical practice and improve oral health. Hopefully these actions, in addition to realising local benefits, will have so-called 'butterfly effects', i.e., a butterfly flapping its wings – a small action - causing dramatic effects the other side of the world.

Never underestimate the power of positive actions, however small – every little bit helps!

Nairn Wilson FICD
Editor-in-Chief

Reference
1. Oral health. World Health Organisation, 2021; EBI148.R1

New Editor-in-Chief

Michael Thomas FICD, Associate Editor, was unanimously appointed by the European Section's Board of Regents in June 2021 to succeed Nairn Wilson as the Section's Editor-in-Chief. Michael, who has played an important part in the production of ICDigest 2022, will become Editor-in-Chief following the conclusion of the Section's Annual Meeting in Porto, Portugal in June 2022.

See page 50 to meet the new Editor-in-Chief.

News from the Districts 2022

The news from the Districts feature was revived in the 2020 issue of ICDigest. This was well received and hence has been restored as a regular feature of ICDigest.

Michael Thomas – FICD
Member ICDigest Editorial Board

As with 2020, 2021 was a challenging year given the worldwide Coronavirus pandemic. The Annual Meeting of the Section, which had been scheduled to take place in Porto, had to be postponed for a further 12 months. However, many of the 15 districts of the Section were able to hold their own meetings in 2021 and carried out induction ceremonies for their new Fellows. At these meetings, a message was given by the Section President, Gil Alcoforado (Fig. 1), to welcome all new Fellows to the Section. This took the form of a recorded message, if Gil was not available for a live internet presence.

On Friday 12th November the induction ceremony for the nine inductees of District 11 (Portugal) took place in Lisbon, when Gil was able to attend in person. Although attendance at the ceremony was limited, given pandemic restrictions, it was described as a beautiful, emotional occasion, with the ceremony befitting our College, inspired by the College motto: "Recognising service and the opportunity to serve".

District 7 (Greece and Cyprus) held a meeting at the Electra Palace Hotel, Athens, on 14th November. An introductory speech was given by the Regent, Professor Aris Petros Tripodakis, providing a concise history of the District and acknowledging the founding service provided by Dr. Papasotiriou and ICD Master Professor Tsoutsis. Three new Fellows were inducted in the presence of 12 attendees. A meal followed the induction in a venue with a view of the Acropolis in the background (Fig. 2).

District 6 (Germany) held a meeting on 1st October in Munich. Five new Fellows were inducted in the office of the interim Regent, Wolfgang Bockelbrink, followed by a meal together in downtown Munich.
Earlier in 2021, Professor Reinhard Hickel, Fellow and Dean of the Medical Faculty of the University of Munich, received the Golden Badge of Honour of the German Dental Chamber, the highest honour awarded by the Chamber. Professor Hickel is also a member of the Leopoldina, the German National Academy of Sciences, and

Fig. 1: Gil Alcoforado, the President, makes a virtual appearance at the District 1 (Austria) induction ceremony, with Regent Werner Gil in the foreground.

Fig. 2: Fellows, new inductees and guests of District 7 (Greece and Cyprus) enjoying a meal following the induction ceremony.

Fig. 4: The Induction Ceremony for District 4 (England, Scotland and Wales).

has received the Hollenbeck Memorial Prize from the Academy of Operative Dentistry. He is a member of the Scientific Committee of the FDI and an active member of the Munich Desturi Foundation, which provides education and support to orphans in Kenya.

In District 3 (Scandanavia) the borders between the countries of the region were closed for much of 2021. Hence a virtual ceremony was held on October 30th to induct the District's two new Fellows. The Regent, Anders Skoglund, noted that there has been a trend in the District towards non-dental investors purchasing private dental offices. This has resulted in a focus on the business of dental offices rather than the quality of care provided. The availability of dental care has also been reduced during the pandemic, with emergency care only being provided by many offices and clinics. This has been an issue throughout Europe in 2021, and presents an ongoing challenge to the profession as gradual moves towards a recovery continue. When and how the substantial backlog of non-urgent care will be addressed remains uncertain.

District 15, Central and Northern Europe, also held a virtual induction ceremony (Fig. 3). This district is, geographically, the largest district in the Section, but the virtual ceremony allowed eleven new Fellows from six countries to be inducted. At the end of the Ceremony, the famous violinist Yuri Kyrychenko performed, playing "Storm" by Vivaldi, reflecting the circumstances of the time and the uncertainties in hearts and minds!

The induction ceremony for **District 10** (Italy) took place in Milan on 17th July 2021. Ten new Fellows were inducted following an informal lunch. Regent, Mauro Labanca, introduced the new Fellows to a total of forty two attendees from all regions of Italy. One of the inductees, Francesco Giachi Carù, described the ceremony as a "family atmosphere that motivated me to give my best in this new life experience and has spurred me to invest my strength in the purposes of the College to be committed to others."

On Thursday 4 November 2021, **District 2** (the Benelux countries) held its induction ceremony at the Groote Industrieele Club in Amsterdam. Four new Fellows were inducted. Master Fellow Frans Kroon gave a passionate speech about the history of the ICD and its goals and aims. Walter van Driel, President-Elect of the Section, read out the pledge with great conviction. The ambiance of the library of the Groote Industrieele Club contributed to the importance and significance of the ceremony. The new Fellows and attendees considered the occasion and experience to be very special.

District 9 (Israel and Malta) held an induction ceremony in Herzliya, Israel on 9th July. Six new Fellows were inducted. Thirty Fellows and their spouses attended the ceremony. Regrettably, travel restrictions prevented Fellows from Malta being able to attend.

Fig. 3: Regent Serhiy Radlinski prepared to conduct the District 15 (Central and Northern Europe) virtual ceremony.

Figure 5: The District 12 (Spain) induction, held in the Academy of Medicine of the Balearic Islands.

District 4 (England, Scotland and Wales) inducted fourteen new Fellows (Fig. 4) at an event held over the weekend of 20th/21st November at Brooklands -the site of a famous former motor-racing circuit. Over eighty attendees were entertained by an enlightening talk by retired Fellow, Dr John Mew, who gave a fascinating account of his escapades motor racing on the original Brooklands racing circuit and around the world during his career as an orthodontist. He informed the attendees that he still holds the lap record at the Brands Hatch motor racing circuit for the class of racing car he drove. Professor Phillip Dowell presented an update on projects and initiatives supported by the College's Global Visionary Fund. The District Regent, Mark Wright, was honoured to present Master Fellow Phillip Dowell with a Life Membership of the College. An enjoyable day culminated in a black-tie dinner to welcome the new Fellows.

Seven new Fellows were inducted by **District 12** (Spain) on 24th September at a ceremony held in Palma de Mallorca at the Academy of Medicine of the Balearic Islands. Like other District induction ceremonies, the event aimed to replicate the splendour of the traditional Section-wide induction ceremony (Fig. 5).
On November 6, the Second Scientific-Solidarity meeting, organized by Dr Antonio Castaño, was held in Seville for the benefit of the Philip Dear Foundation. One hundred and thirty people attended. The speakers were the new Fellows of the College.

The Austrian District, **District 1**, held a meeting at the home of the Regent, Werner Lill. Twenty four Fellows were present and took the opportunity to meet in person the District's three new Fellows inducted at the event. Past President of the Section, Peter Brandstätter, acted as the master of ceremonies, assisted by the Vice Regent, Hans Mayr.

District 8 (Ireland) held its induction ceremony in the beautiful Castle Leslie in County Monaghan on 11th November. A total of 39 Fellows and guests booked out the whole castle for a prosecco reception and the induction of six new Fellows (Fig. 6), followed by a six course meal in the great hall of the castle.

Concluding remarks

The ICD has been honouring the world's leading dentists since 1920. The European Section has continued to support this endeavour during 2021, despite the challenges of the Covid-19 pandemic. Each District held an induction ceremony to enrol new Fellows who undertook to support the primary objective of the College: "To advance the science and art of dentistry for the health and welfare of the public internationally".
Whilst it was not been possible for the Section to hold the planned Annual Meeting in Porto, much hope is placed on there being a positive change in circumstances in 2022, allowing the postponed Porto meeting to go ahead. ■

Fig. 6: The 6 new Fellows for District 8 (Ireland) with Regent, Dr. Richard Graham.

Humanitarian Activities 2021

As may have been noted in newsletters and on the website, many Fellows, despite pandemic restrictions, have remained active locally or, in some cases internationally in maintaining established humanitarian projects.

Frans Kroon – MICD
Past-President European Section

Regrettably, postponed gatherings have denied us the opportunities to meet to exchange information about these activities, applaude their outcomes and encourage further developments. Also, disappointingly, there have been no new applications for support from the Philip Dear Foundation, one of many, different regrettable negative effects of the ongoing pandemic. Hopefully, come the 'new norm' the Section will return to being proactive in providing support to sustain and expand the Section's humanitarian activities and to sharing and celebrating positive outcomes in this important endeavour.
In the meantime I am pleased to report updates on three projects supported by the Section.

Vincente Lozano de Luaces
Vice-Regent Spain

Project India

It was not possible to carry out my project in India in 2021, because my team and I were unable to obtain permission from the government of India to be granted a work visa. I´m sorry.
I think my team (6 doctors, 1 nurse and 1 hygienist) and I will go to Himachal Pradesh (North India) in August 2022 to work in Dharamsala -the Saint Residence of the XIV Dalai Lama. Also, over the summer, I plan to work in North Delhi in the Tibetan Colony treating disadvantaged Tibetan people, including elderly monks and children with disabilities.
If possible, around Easter (April), I will go to Tibetan Colony in N Delhi and Dharamsala, ahead of presenting a report on my project at the meeting in Porto.

Mariana Dolores
Mundo A Sorrir

Mundo A Sorrir

Mundo A Sorrir is a non-governmental organization founded in 2005 in Oporto, with the mission of promoting health and oral health as a universal right. We develop activities for prevention and health literacy, medical assistance, training of health professionals and research.
2021 was a year severely affected by the COVID-19 pandemic worldwide, nevertheless Mundo A Sorrir kept developing activities in Portugal and three African countries: Cape Vert, St. Tomé and Principe and Guinea-Bissau. Also, this year, we saw our work recognized by several public and private institutions, including the City Hall of Oporto that awarded us the Town Gold Medal (Fig. 1) and nationally the Maria José Nogueira Pinto Award (Fig. 2), a well-recognized award that recognizes innovation in the health sector in Portugal.

In Portugal in 2021 we had nine projects in development:

Learning to be healthy, develops preventive activities in kindergarten and primary schools, working with the children, teachers and parents. The main objective is to promote healthy lifestyles amongst the children and to prevent oral diseases (Fig. 3). In 2021, 11,313 people benefitted.

Fig.1: The award of the Porto Gold Medal.

Fig. 2: Receiving the Maria José Nogueria Pinto Award.

Fig. 3: Mundo A Sorrir toothbrushes.

Door to door smiles, aims to improve the oral health of elderly residents in nursing homes and day care centers and amongst those with home support. In addition to providing direct support for elderly individuals, this programme provides training sessions for careers, including instruction on the early detection of oral cancer. It benefitted 1,335 individuals in 2021 (Fig. 4).

Fig. 4: 'Door to door smiles' care.

Four Oral Support Centers: Dental clinics in Oporto, Braga, Lisbon and Cascais promote social inclusion through the improvement of oral health in socially disadvantage people. The care provided intends to enhance self-esteem and quality of life and provide better job opportunities. In 2021, 536 people benefited (Fig. 5).

Fig. 5: Care in a Mundo A Sorrir Oral Support Centre.

Train, prevent and include: The main aim of this social innovation project is to prevent and treat oral disease amongst the homeless. Some of this work is undertaken in institutions; some in the streets. Some patients are referred to one of our oral health support centers to receive dentures and specialised treatment. In 2021, 272 people benefited from this project (Fig. 6).

Fig. 6: A homeless person receiving treatment.

FOCA-TE (Fight oral cancer amongst teenagers). This project benefits the young, focusing on the prevention of oral cancer by minimizing the risk associated with, amongst others drugs, alcohol and tobacco consumption. The project has an innovative methodology and substantial capacity to be replicated throughout Portugal and in other countries. A total of 1,130 people benefited from this project in 2021 (Fig. 7).

Fig. 7: Oral cancer counselling.

Smile Cascais. This project focuses on preventing oral disease and promoting healthy lifestyles amongst the most disadvantaged of the population of Cascais. The project benefits children, adults of all ages, specifically those with special needs. In 2021, 2,375 benefited from this project (Fig. 8).

Fig. 8: Promoting healthy lifestyles in Cascais.

In Africa our approach is very similar that in Portugal. We rely on lots of volunteers. In 2021, 25 volunteers participated in our African missions. We seek partnerships with governments and with local community and private institutions to promote the development of the country.

In **Guinea Bissau,** we have four projects:

A social clinic, funded by the ICD Global Visionary Fund, provides the population of the Antula region in Bissau to oral and medical health care (Fig. 9). In 2021, we had one volunteer who worked in the clinic throughout the whole year, together with a team local doctors, dental assistants and administrators. Between January and November, 1,272 people benefitted from this project.

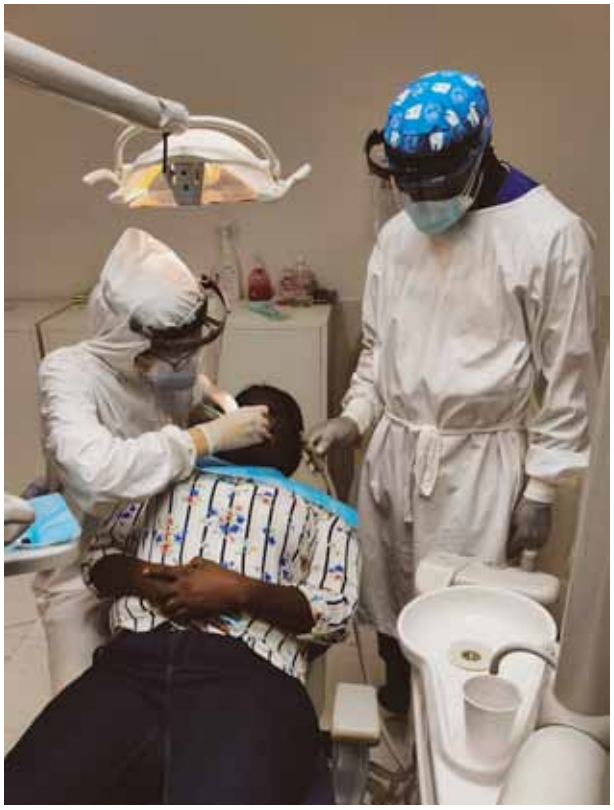

Fig. 9: Dental treatment being provided in the Antula social care clinic.

Healthy smiles. This project aims to improve the oral health of the population of the Bijagós Islands. The project is funded by the Phillip Dear Foundation. In 2021 there were two volunteers and more than 1,000 beneficiaries (Fig. 10).

Fig. 10: Bijagós Islands children receiving instruction in healthy lifestyles.

Health education, provides training for health professionals in the fields of oral health, ophthalmology and mental health. The aim is support and enhance the knowledge of local health professionals. In 2021, 32 health professionals and 179 nursing and medical students benefitted. Eight volunteers were involved. More than 157 hours of lectures were presented.

In **Cape Vert,** we have been developing activities since 2005. At present work is being undertaken on two islands: S. Vicente and S. Antão. The project focus on developing preventive activities in the schools, screening the children and treating the ones with most need. This project, supported by local dentists, illustrates the beneficial impact that a long-term project can have on a community. In 2021 around 1,100 children benefited (Fig. 11)

Fig. 11: Screening of children in Cape Vert.

In St. Tome and Principe, the focus is on prevention, training and medical assistance, together with specialist dental treatments. More than 1000 people in 2021 (Fig. 12).

Fig. 12: Dental treatment being provided in St. Tome and Principe.

Continuing humanitarian activities of ICD Europe in the Philippines

Dr Farr is to be congratulated on the success and sustainability of his project in the Philippines. He can be proud to have achieved so many positive results and long-lasting effects. The Philip Dear Foundation will hopefully be able to continue to support this project.

Hani Farr - FICD

Your request came at the time of the ten-year anniversary of the GK Hope Village project. To mark this special occasion, I am sending you a selection of highlights and pictures from previous reports.
Given the worldwide pandemic and the dangers it has posed, the project activities have been curtailed over the last two years. It is hoped that the activities can be resumed in 2022.

The GK Hope Village project – the first ten years

Gawad Kalinga (GK) Hope Village, a remote village in Barangay Cabatangan, Talisay, Negros Occidental in the Philippines, acquired its first-ever, fully functional dental clinic in 2012, supported by funding from the Philip Dear Foundation. GK Hope is a small village, comprising around 300 families. It is located in the middle of a sugarcane plantation, seven kilometers from the city of Talisay.

The clinic was erected and fitted out within 14 days in late June, early July 2012. Hani, a periodontist from Vienna, travelled to the Philippines to inspect local conditions and personally supervise the construction and commissioning of the clinic. As a long-standing and respected member of the European Section of ICD, who had successfully initiated similar projects for the ICD in Mexico and the Dominican Republic, he was well-placed to lead the project in the Philippines.

With financial support from the European Section, Hani was able to purchase all the necessary dental equipment and instruments in Manila and have them transported to Talisay at short notice. Together with Talisay City Mayor Eric Saratan, Hani oversaw the official opening of the clinic on 7 July 2012 (Figs. A and B).

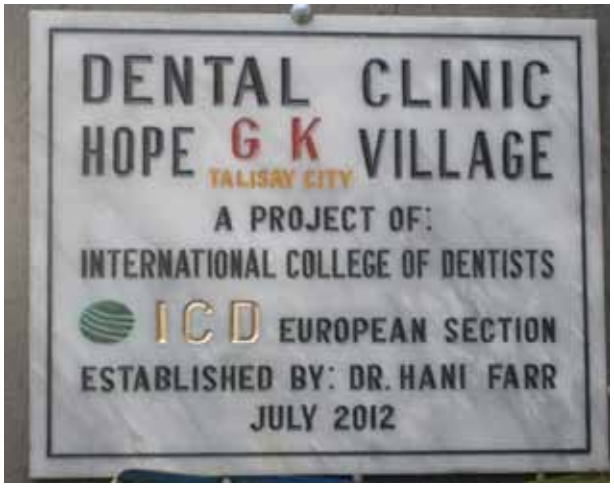

Fig. A: Plaque commemorating the start of the Hope GK Village project.

Fig. B: Dental equipment in the GK Dental Clinic.

With the cooperation of several local dentists, free dental care was offered both to the residents of the village and residents of neighboring villages. Soon the clinic was benefitting over a thousand families within a 15-kilometer radius.

During his trip, Hani was also able to visit the Iloilo Doctor's College of Dentistry, where he agreed arrangements with school officials to involve the young graduates in the project. The arrangements including provision for on-site training at the GK Hope Dental Clinic in areas such as periodontics and prophylaxis, endodontics, surgery and implant dentistry. In this way, the dental clinic project could provide free dental care for GK residents and the neighboring population and will provide dental education and training.

Gawad Kalinga

The term 'gawad kalinga' means support or assistance. Gawad Kalinga (GK) is a non-governmental organisation (NGO) in the Philippines, which has set itself the task to provide the poor and needy people of the Philippines with decent homes, and to improve their living standards and quality of life through education, livelihood and free medical care. GK recipients are the poorest of the poor - the homeless and those living on the edges of society in so-called slums. GK supports more than 2,000 villages spread over the Philippine archipelago. Three to five hundred families live in each of the villages.

Negros

On Negros -one of the Philippine islands, the main source of income is agriculture -sugarcane. The city on Negros, Talisay has c.600,000 inhabitants. In the Barangays (Barrios) – the rural area of the island, where the dental clinic is located there are 230,000 to 250,000 inhabitants. There are no government medical or dental care facilities within a 15-kilometre radius. In emergencies, people travel to the nearest government dental clinics, but they are not always open. Treatment options are limited to pain relief, typically tooth extraction. Dentures are a foreign concept to the local inhabitants, as the population barely has resources to exist. There are no dental practices, as dental treatments are unaffordable for the average citizen.

Sustainability

During Hani Farr's visit to GK Hope Village in July 2014, the dental clinic project took an important step towards a sustainable and promising future with the introduction of the GK educational dental hygiene programme. Arrangements to introduce this initiative at other schools in the area were discussed.

Prophylaxis and oral hygiene are central elements of the GK Hope Village Dental Clinic Project. It is not enough to provide free dental services to the inhabitants of GK Hope Village. The services must be supported by continuous training of the local teachers, as their knowledge of the causes and consequences of dental disease and commitment to hygiene, specifically oral hygiene and healthy eating is critical to changing the student perspective on personal and dental hygiene and the importance of oral health. Hani has personally undertaken most of the training.

The children at GK learn about personal hygiene and dental issues in a playful manner. Through role-playing at the Dental Clinic, they can take on the role of the dentist, the patient or the assistant (Fig. C). Furthermore, the children are provided with a range of hygiene products and practice brushing their teeth at school (Fig.D). Regrettably, the children lack sanitary facilities at home to continue personal and oral hygiene routines outside school. As a consequence, one of the current priorities at GK Hope Village is to set up 'sanitary/hygienic corners' outside the dental clinic. Each 'corner' will consist of six to eight wash bowls and mirrors and will be available for use by all the students of the school. The plan is ready and the feedback both locally in GK and from the European Section of ICD has been very positive.

Fig. C: Children learning through role-playing.

Fig. D: Children brushing their teeth at school.

Recent cooperation with the Philippine Dental Association – which contributed greatly to the success of events to mark annual dental health days in GK – provides new opportunities to involve dentists in the project (Fig. E).

Fig. E: Volunteers from the Philippine Dental Association.

It gives great pleasure that GK inhabitants show a growing interest in their children being dentally aware. Indeed, there has been a paradigm shift: most children are no longer afraid of seeing the dentist, as they now associate dental visits with enhanced oral health rather than pain.

Long-term strategies

The long-term strategies for the project remain:

- Reducing the burden of oral disease amongst the population of GK and neighboring villages.
- Promoting healthy lifestyles and oral health and reducing risk factors.
- Developing the provision of oral health services.
- Integration of oral health into national and local community health programmes. ■

The Philip Dear Foundation

The Philip Dear Foundation (PDF) is a charitable fund for educational and humanitarian purposes which the European Section established in June 2005 to celebrate its 50th anniversary and to commemorate Philip Dear, considered by many to be one of the key Founding Fathers of the European Section. Anyone wishing to make a donation, or give notice of a legacy to the PDF, possibly in memory of a family member,friend or colleague, in the event of some monetary good fortune, or simply out of personal generosity to allow the Foundation to expand and enhance its activities, may do so by contacting the Treasurer of the European Section, Maren de Wit (medewit@witmede.nl), or by making an electronic transfer to ICD European Section NL22 ABNA 0414 5452 81. It is always enriching to give!

Lessons for today from Pierre Fauchard 1678-1761

What can we possibly learn, that would be relevant today in the 21st century, from a dentist working in 18th century France? Looking back at historic text books and papers, it is all too easy to dismiss many of the strange treatments and procedures practised at that time as being useless or barbaric.

Margaret Wilson
Honorary Curator, British Dental Association Museum
Editor, Dental Historian

Over the decades our profession, and the way dental treatment is provided has tended to evolve slowly, punctuated by some notable advances. However, what is so intriguing in the history of dentistry is that in most era someone emerges who almost single-handedly rapidly progresses the profession and changes the practice of dentistry. It is my belief that Pierre Fauchard, the "Father of Modern Dentistry", was just such a man. He challenged many of the ways dental treatment was provided, and could be considered as a revolutionary practitioner whose influence became global. The year 2021 was the 260th anniversary of the death of Pierre Fauchard, so it is timely that we review what we have learned from his life.

Who was Pierre Fauchard?

Pierre Fauchard was born in France during the age of the Enlightenment. The Enlightenment or Age of Reason was a period in Europe which saw great changes occurring in science and philosophy. Old ideas and superstitions were discarded in favour of scientific study and observation. This environment probably set the scene for Fauchard to reconsider how patients were treated and what treatments were successful.

Fauchard was born in Brittany, France in 1678. He served as a trainee surgeon in the Navy of the King of France. In the French Navy Fauchard was the pupil of the Surgeon

Fig.1: Pierre Fauchard.

Fig. 2: Frontispiece of "The Surgeon Dentist or Treatise on the Teeth".

In 1719, as a well-established practitioner, with the reputation of being a skilled surgical operator, he moved to Paris.

Major A Poteleret, whom he described as an able man who imbued an enthusiasm for his future career[1]. It is thought that Fauchard may have developed his interest in diseases of the mouth and teeth during the time he spent as a naval surgeon. As a ship's surgeon he would have seen and treated many sailors suffering the oral effects of scurvy. He left the Navy in 1696 and set up practice in Angers. By1700 he was restricting his practice mainly to dental treatment. In 1719, as a well-established practitioner, with the reputation of being a skilled surgical operator, he moved to Paris.

At that time the development of the dental profession and dental treatments and techniques was not progressing at the same rate across Europe. For example, in England in the 18th century the Guild that united the barbers and surgeons was not dissolved until 1745, with some barbers continued to extract teeth, calling themselves *tooth drawers*. It was a direct result of the work of Fauchard and his publications that by the end of the 18th century the terms *dentist* and *operator for the teeth* started to be used. Fauchard was the first to call himself a *'surgeon-dentist'.*

Fauchard on knowledge and fellowship

When Fauchard was practicing, there were no text books available to enable dentists to learn new skills. Practitioners worked independently, jealously guarding their successes and not sharing ideas in case they lost a patient to a competing practitioner. What was so special about Fauchard was that he shared his knowledge. He recorded all his techniques and observations from treating patients. He drew diagrams of instruments he had designed and found useful and shared the techniques that he had found ▶

to be successful. All the valuable information that he had accrued over the years was carefully documented, peer reviewed and recorded in a book. The book, for which he is most famous , entitled, "Le Chirurgien Dentiste ou Traite des Dents" "The Surgeon Dentist or Treatise on the Teeth" (Fig. 2) , published in 1728, was hailed as a major professional medical event.

In his book Fauchard considered: anatomy of the teeth and supporting structures, soft tissues, diseases of the teeth and gingivae, clinical observations from dental practice, orthodontics, surgery, new instruments, construction of prosthesis, methods of manufacturing dentures, material for making dentures out of gold silver or ivory, and enamelling techniques to improve the appearance of replacement teeth.

He also described how instruments and processes used in other arts and trades such as mechanics, jewellery making and enamelling could be used in dentistry.

Not all the work in his book was exclusively by Fauchard. He also included any established methods which he had found to be successful. He also described how instruments and processes used in other arts and trades such as mechanics, jewellery making and enamelling could be used in dentistry. Before publishing, he had his book reviewed by an existing practitioner, possibly the first form of peer review in dentistry. It could also be considered the beginning of evidence-based practice where expert opinion forms the basis of the hierarchy of evidence.

Fauchard on training

You may think modern dentistry is nothing like the unregulated profession of two and a half centuries ago. Today we have formal dental education, tested by examinations, new skills are shared and we have regulation for the protection of the public. In the days of Fauchard, there was little or no education in dentistry, charlatans plied their trade from village to village, with patients offered no protection from uneducated, untrained operators and potentially dangerous or ineffective materials or procedures. In a paper read in 1922 at the Sorbonne, Paris to commemorate the bicentenary anniversary of the publication of Fauchard's work, Viau (1923) noted that Fauchard stated: *"…a fundamental requirement to enter our profession and to become a credible and useful practitioner worthy of its name would require a long period of study and manual dexterity of the highest order".* Few would disagree with that statement today, especially our patients. Fortunately, we now have dental schools offering superb education. We also have regulation governing the training of our dental graduates and conscientious dental manufacturers voluntarily complying with evidence-based standards, resulting in high quality dental products.

Fauchard on quacks and charlatans

What could we learn from Fauchard? We tend to think of quacks and charlatans as part of dentistry's dark history, but maybe there are still charlatans operating under another guise. Could the internet, which enables the sharing of knowledge, be the home of modern-day quackery? Fauchard didn't recommend any treatment procedure or instrument that had not been personally tried and tested. In fact, he specifically mentioned that he would not give any space in his text book for the claims of charlatans.[2]

A superficial surf of the internet reveals a plethora of information under the broad heading of dentistry. The public are enticed to use untested cures for dental ailments, tooth whitening and bleaching and, amongst many other things, toothpastes that probably have little to recommend them for either protecting against dental caries or periodontal diseases. Also, the public are encouraged to undertake procedures – 'DIY dentistry', with no professional supervision, let alone a full oral health assessment, or consideration of their medical history.

In addition, dentists can be seduced into buying cheap dental instruments, materials and other consumables that have not been manufactured to national or international manufacturing standards, typically putting their patients at risk. So, the travelling quack and charlatan of yesteryear, travelling from town to town, may be considered to have been replaced by the internet which we have welcomed into our homes. Now more than ever, it is vital that the profession protects itself and the public from the modern-day charlatan. As encouraged by Fauchard, practitioners and patients should use only tried and tested techniques, backed up by sound scientific research. Evidence and informed professional judgement must underpin advances in clinical practice and patient care. ■

References

[1] *Viau G. The life of Pierre Fauchard (1678-1761). Dental Cosmos,1923; 65: 797-808.*

[2] *Walsh JJ. Fauchard, the father of modern dentistry. Dental Cosmos, 1923; 65: 809-823.*

Managing dental trauma

Dental trauma causes stress. The injured patient is afraid, has pain and is often uncooperative. Accompanying persons, typically one or both parents, are worried and upset. The dental team is not prepared for the patient, must change the planned schedule at short notice and try to calm the patient and the accompanying persons. This is a breeding ground for mistakes. By following a well-rehearsed protocol, these can be avoided.

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Acute damage and injury to teeth, the periodontium and oral and adjacent facial soft tissues is challenging for everyone involved. Dental injuries may occur at any age and to all teeth, but the incidence is high in the permanent dentition of young people of 10-14 years of age.

Bleeding, swelling, and pain are very unpleasant in themselves for most children. In addition, the consequences of dental trauma at a young age usually become the first, possibly unpleasant dental treatment experience for the patient. Fear of the unknown plays an important role here. Parents suffer great anxiety about the necessary treatment and 'will everything be alright'. They are used to seeing their children with intact, well-formed teeth and are suddenly confronted with unsightly dental injuries. The blood and bleeding, which may be present, make it all the more more frightening for both patient and the accompanying persons (Fig. 1).

Fig.1: Dental trauma in a young child caused by a fall while playing. The immediate appearance can look serious, compounded by profuse bleeding from the injury to the upper lip, but after cleaning and control of the bleeding the injury appears less dramatic. It is important, however, to check the integrity of the teeth to ensure that no pieces have broken off and become embedded in the lip. If a piece of the crown is missing, the wound in the lip continues to bleed, or a lump, possibly a foreign body can be palpate in the injured tissues, a soft tissue radiograph of the lips is indicated.

In the circumstances, the dentist must take command of the situation and make time, irrespective of other commitments, for the necessary examination and immediate (emergency) care. Booked patients, whose treatment will be delayed, will hopefully be understanding, once the situation has been explained.

Creating order – classification, first aid and addressing immediate issues

Dental trauma is a complex matter. Several tissues and structures may be involved. It is therefore important to create order quickly and effectively in the potential chaotic situation by correctly classifying the trauma (Table 1).

With the trauma classified, it is of the utmost importance to calm the patient and the accompanying persons as much as possible and to immediately ascertain any medical complications. This is especially important if the dentist is first to examine the patient following the accident. A checklist, such as that in Traumatic Dental Injuries: A Manual' (J.O. Andreasen, Munksgaard) should be to hand for use in such circumstances.
If there are no indications of any conditions, specifically ▶

tooth	periodontal ligament	bone	gingiva or oral mucosa
crown infraction	contusion	tooth socket	laceration (cut or tear)
crown fracture *uncomplicated*	subluxation	alveolar process	contusion (bruising)
crown fracture *complicated*	intrusion	maxilla	abrasion
crown-root fracture *uncomplicated*	extrusion	mandibular body	
crown-root fracture *complicated*	lateral luxation	**mandibular condyles**	
root fracture	avulsion	**coronoid processes**	

Table 1. Classification of trauma to teeth and adjacent tissues.

life-threatening conditions, requiring urgent medical referral and attention, first-aid and the dental examination can proceed. Do this systematically, taking care not to overlook any injuries, signs and symptoms of associated trauma and pre-existing problems. If any cerebral (neurological) abnormalities or skull fractures are suspected, the patient should be referred to hospital immediately, possibly following immediate measures such as stemming bleeding and replantation, if this can be achieved quickly and effectively in the limited time available.

Take time and remain calm. The chairside assistant can provide immediate care for the patient. Just washing the bloodied and soiled face (preferably using disposable sponges), covering blood-stained clothes, being reassuring and making the patient as comfortable as possible is often a great relief in itself. In the meantime, the dentist can ask the accompanying parent(s) or person about the nature of the trauma and the relevant medical history, if this is not already known, followed by a short explanation of the procedure to be followed. In doing so, it is important to address the importance of detailed record keeping, the need to conduct a detailed examination to determine the extent and nature of the injuries, immediate treatment, legal and insurance issues, the need for review, and possible long-term consequences.

Record keeping

Photographic records

Record keeping begins with a photographic record of the injuries. At this stage, portrait photos (frontal and profile) should be taken. If possible, photographs of the teeth should be obtained in maximum occlusion or as close to that position as possible, together with pictures to record any facial soft tissue injuries These photographs can aid the examination, diagnosis and treatment of the patient, any necessary specialist referrals and in completing follow up reviews. The photographs may also play an important role in dealing with any insurance or compensation issues arising from the trauma.

When, what, where

The three W's of the accident, when, what, where, help ascertain the nature of the trauma.

Where possible, the questions should be addressed to the patient, even if young. Best to have the victim answer as many of the necessary questions as possible. If the patient is unable to provide the required answers, the questions may be addressed to the parent(s) or accompanying person, mindful that they may not have been present at the time of the trauma.

When

It is important to know how much time has elapsed since the accident happened. As time passes, blood clots form in the injured area, pulpal and mucosal wounds become infected, and the exposed periodontal ligament on luxated and avulsed teeth may deteriorate or dry out over time, especially if not protected in some way such as immersion in saliva or possibly milk when being transported with the patient to the dental practice. The elapsed time will influence, if not determine treatment decisions and prognosis.

What
Explanation of what occurred helps determine the type of trauma suffered by the patient. Circumoral injuries involving the face and lips usually result in damage to the anterior teeth. Blows to the chin and mandible often cause damage to multiple teeth. The force, speed and direction of the "blow", the elasticity and shape of the object with which, or on which the trauma occurred may influence the extent and nature of injuries to the teeth and adjacent tissues. For example, a short, powerful impact with a hard object usually causes fractures of the teeth. The location, direction and energy of such an impact determine the likelihood of developing crown or crown-root fractures. If teeth absorb most of the energy of the impact, the risk of damage to the surrounding tissues is reduced. A slow blunt blow with, or on a relatively soft object, or with the intervention of the lips is more likely to cause displacement of teeth, or fracture of the alveolar process, with or without root fractures, the energy of the impact being more distributed than the energy of impacts directly to the teeth. For example, a fall on to the upholstered armrest of a chair usually results in a luxation or root fracture, while a fall on to a stone floor often results in crown fracture.

Where
The location of the accident influences treatment planning and prognosis. If the accident happened outside, tetanus prophylaxis may be required.
Was first aid provided? On a sports field, this is often the case. Sometimes, for example, an avulsed front tooth may have been replaced.

It is important to make detailed records of all these matters as full records of traumas can be invaluable years after the incident, or in the event of legal proceedings.

Clinical examination

The chief complaint may give clues as to the extent and consequences of the trauma. If, for example, normal occlusion is not possible, it is an indication that teeth have been displaced or the jaw is fractured. In such circumstances, the patient will indicate that 'the teeth do not fit together'. Worsening of the pain when attempting to close may indicate a crown, crown-root, or root fracture and fracture of alveolar bone.

Extra-oral examination
Injuries to the scalp, skin of the head and neck and vermillion borders of the lip are usually easy to detect and record, give visible damage and bleeding. Abnormal bone contours can be more difficult to identify. The facial skeleton should be systematically examined and palpated, with the patient being asked to make opening and closing movements of the mandible. Abnormal deviations and other movements, steps in the lower border of the mandible, rim of the orbits, or along the length of the zygomatic arches may be indicative of bony fractures, especially if associated with pain, swelling and bruising. Also, distortions and deviations of the nose, together with nasal bleeding at the time of the trauma may be indicative of nasal fracture. In the event of suspecting one or more fractures of the facial skeleton, the patient should be referred for specialist care.

Intraoral examination
Soft tissues
Inspection of the mucosa of the palate, floor of mouth, underside of the tongue, vestibular spaces, lingual aspects of the lips and the gingivae should be undertaken to identify any tears, soreness, swelling, bruising and bleeding. The anterior margins of the left and right ramus of the mandibular should be palpated to identify any steps indicative of fracture. A punctured lip that continues to bleed and includes hard areas may indicate the presence of embedded tooth fragments or a foreign body.

Hard tissue
Carefully inspect the teeth under a good light, having removed any blood residues in the mouth and on the teeth, using a gauze moistened with physiological salt solution. Use loupes or other magnifying aids, a rhodium front surface mouth mirror, a sharp probe and a periodontal pocket probe. Transillumination will aid the diagnosis of fractures and cracks. Crown discolouration (pulpal haemorrhage), tooth displacements, incisal edge fractures, fracture of cusps and crowns and pulpal exposures are normally readily identified. Where teeth have been lost, the sockets and surrounding tissues must be examined carefully to exclude the possibility of one or more teeth having been luxated into the alveolar process, or in the case the maxillary buccal segments into the maxillary antrum. Also, ascertain if the patient coughed violently at the time of the trauma, possibly indicating inhalation of part or all of a displaced tooth. Using percussion and sensitivity testing, the teeth should be examined for signs and symptoms of displacement and damage. Damage to the periodontal ligament (e.g., torn fibres) may complicate this stage of the examination. The pitch of the percussion sound can also give important indications. A high metallic sound indicates that the tooth is impacted in bone (intrusion and lateral luxation). If pulpal exposures are suspected, use moist cotton pellets to clean and help examine the affected sites. Crown fractures may be detected by gently applying finger pressure to the teeth. Root fractures can sometimes be felt by placing a finger on the alveolus and using the other finger to carefully move the crown of the tooth in a buccolingual direction. Marked deviations in the occlusion plane or a segment of teeth being out of place may indicate a fracture of the mandible or maxilla. A fracture of the mandible can be demonstrated by pressing a thumb down on the occlusal surfaces of the molars while positioning the fingers of the same hand on the lower border of the mandible. Short left-right and forward-backward movements which elicit pain or movement of bony fragments are indicative of a fracture of the mandible. Mobility of teeth following trauma usually indicates displacement. If several teeth move at the same time, this indicates a fracture of the alveolar process.

Pulp tests

Traumatised pulps have abnormal nerve conduction. Responses to cold, hot and electrical tests do not confirm the presence or absence of blood circulation in the pulp. False-negative reactions are common in traumatised teeth. Nevertheless, it is important to carry out these sensitivity tests and to include the findings in the records. Sensitivity of the pulp can return after, for example, six months. If sensitivity returns, or is lost over time, conclusions can be drawn about the status of the pulp.

Discolouration of the crown may also be temporary, specifically in immature teeth. When discoloration fades and the colour of the tooth returns to normal, the circulation of blood has been re-established and the tooth should respond normally to testing.

Radiographs

Periapical radiographs of the traumatised teeth, ideally taken from different orientations, should aid confirmation of the provisional diagnosis and reveal the full extent of the damaged caused by the trauma. Occlusal radiographs facilitate the diagnosis of lateral luxations, apical root fractures and fractures of the alveolar process. Any missing teeth may be found on the radiographs intruded into the jaw or buried in adjacent tissues. Discontinuities in periodontal ligament spaces may indicate a fracture of the alveolar process or of the jaw. Soft tissue radiographs of the lips and circumoral tissues, taken when there are puncture wounds and hard unexplained lumps in the lips or adjacent soft tissues, may reveal buried fragments of fractured teeth or foreign bodies.

Immediate treatment

Following completion of the examination, a working diagnosis having been made and consent having been obtained, urgent, immediate treatment can be provided. This involves, for example, careful repositioning of avulsed and luxated teeth, repositioning of fractured and displaced alveolar process and closure of soft tissue wounds. Repositioning should be verified by checking the occlusion and, where indicated clinically, by means of a radiograph. Then a rigid splint may be applied to immobilise the repositioned teeth (Fig.2).

In the case of alveolar fractures, a splint, like a plaster cast on a broken arm, should remain in place for six to eight weeks. Abnormal tooth mobility should be managed by applying a non-rigid splint for one to three weeks, similar to the strapping of a sprained knee ligament. Exposed pulps may need to be extirpated, or possibly capped, and the patient and parents or accompanying person may be greatly reassured by the initial restoration of tooth fractures, typically in the form of acid etched, composites.

Review protocol

The strict review protocol of one, three and six weeks, three and six months and one year is important for recognising and treating complications of dental trauma.

After one week, it is a good practice to recall the patient to assess their recovery and answer any questions they may have. Further procedures and their importance should be explained. Any temporary splints and dressings can be removed, or replaced as indicated clinically.

Fig. 2: A case of extensive, multifaceted dental trauma following initial management, including repositioning of teeth and a maxillary alveolar fracture and the application of a splint, together with cleaning and closure of the injuries to soft tissues, including the lips.

After three weeks, review radiographs of the affected area are taken and assessed. Previously undetected fracture may be diagnosed. Periapical radiolucency may now be present, possibly together with signs of external inflammatory resorption. Superficial root resorption or resorption at the apex (transient apical breakdown) may be apparent as a reaction to the trauma. The remodelling process (as sometimes seen in orthodontics) of healing. The splint of the luxated teeth can now be removed.

After 6 weeks, the effects of pulp necrosis may be apparent. In principle, traumatised teeth should not be diagnosed as non-vital if only one of the characteristics signs, including discolouration, negative sensitivity testing and periapical radiolucency is present. Incidentally, the consequences of an infected pulp in a traumatised tooth with partial loss of root cementum are much greater than when the protective root cementum is intact. External inflammatory resorption may then occur across most, if not all of the root surface. Immediate root canal treatment is then necessary.

After three and six months, traumatised teeth may return to responding positively to sensitivity testing.

After one year, a provisional long-term prognosis can be made, with the warning that long-term consequences of the trauma may present themselves unexpectedly in the future. This is an important point to consider when, for example, settling insurance or other claims. If there are no signs of root resorption at one-year, the likelihood of this occurring is considerably reduced. Root canal obstruction in the absence of periapical abnormalities is no reason for a root canal treatment, as there is no bacterial infection.

The management of dental trauma is stressful. By following state of the art protocols and procedures unnecessary suffering and long-term consequences may be prevented. ■

An illustrated case history

Fig. A: The lower right canine was avulsed and immediately repositioned. A splint was not required. Given the open apex the decision was taken to monitor the condition of the tooth.

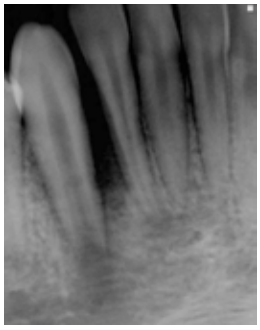

Fig. B: Radiographic appearance at three weeks. Given proximal bone loss and periapical radiolucency, together with a negative sensitivity test, the decision was taken to initiate root canal therapy of the lower right lateral incisor.

Fig. C: Prior to initiating root canal therapy (RCT), there had been no pain but a fistula had formed.

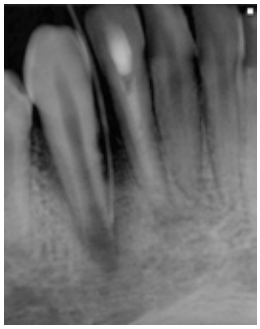

Fig. D: Infection was found to have initiated progressive external, inflammatory resorption of the replanted canine. Immediate RCT of the canine was indicated.

Fig. E: One year review. Patient symptom free, good periodontal condition and no discolouration of the root filled teeth.

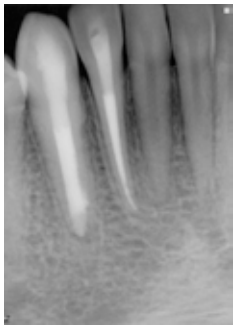

Fig. F: Radiographic review at one year. Periapical and proximal healing and arrest of the resorption process.

COVID-19 and periodontitis

Coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), continues to spread as a pandemic across the globe. Since first reported in China in December 2019, there have been >250 million confirmed cases and > 5 million deaths, at the time of writing.

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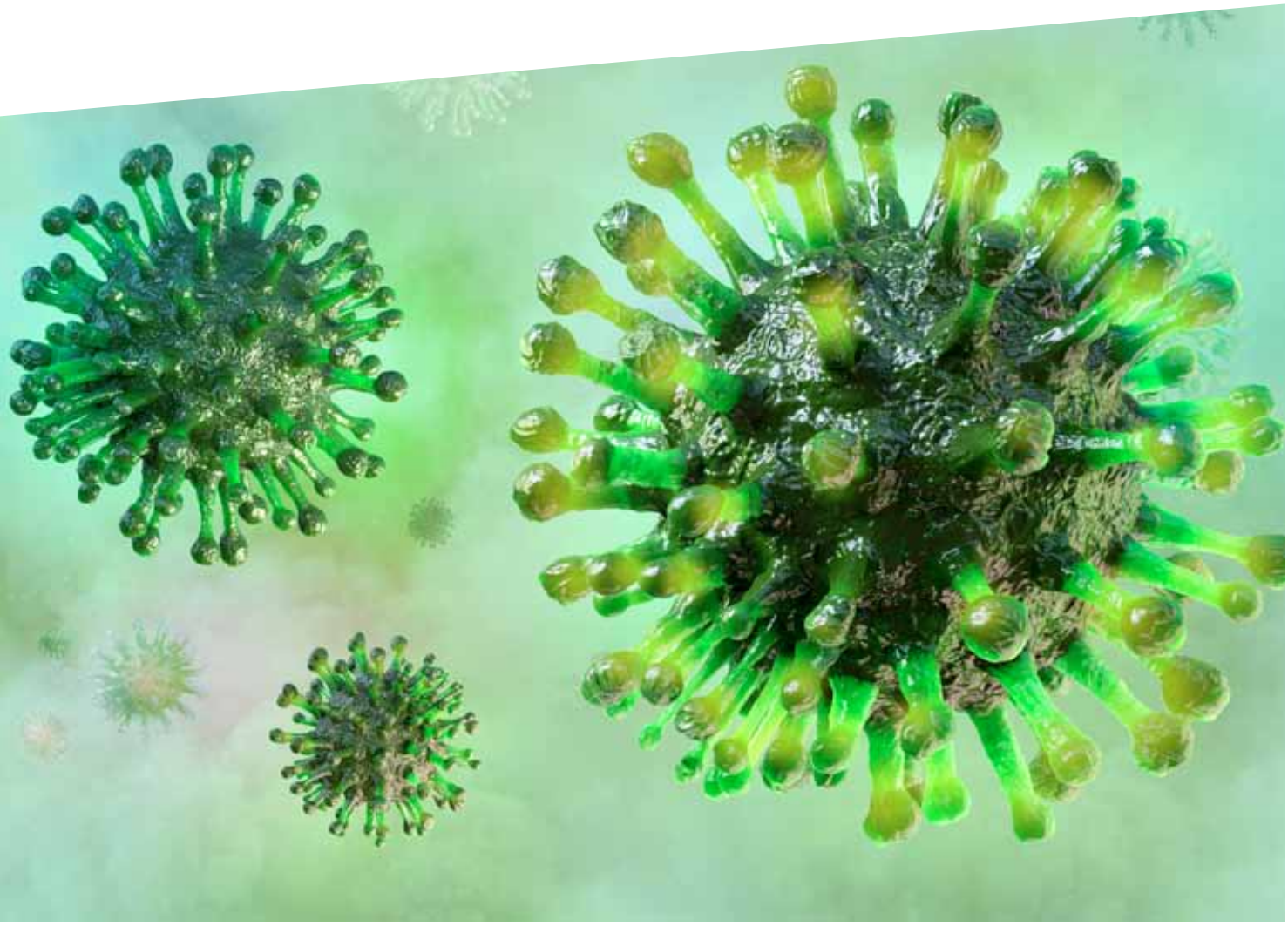
The COVID-19 pandemic remains a public health emergency threatening the well-being of individuals, compromising economies, and imposing a tremendous burden on healthcare systems and healthcare professionals worldwide.

Although most patients with COVID-19 suffer mild disease, and despite advances in the management of the condition, c. 14% of confirmed cases develop severe conditions, requiring hospitalisation, including oxygen support, 5% need admission to intensive care and around 2% die. Severe cases are usually complicated by acute respiratory distress syndrome (ARDS), sepsis and septic shock, leading to multi-organ damage, if not organ failure. Furthermore, patients with severe COVID-19 and ARDS usually present an exacerbated immune response, characterised by excessive levels of pro-inflammatory cytokines and widespread tissue damage, the so-called cytokine storm syndrome.
The risk factors associated with the severe systemic impact of COVID-19 have not been fully identified. It has been suggested, however, that the presence of other co-morbidities, including hypertension, diabetes, coronary disease, aging, and obesity play a significant role.
The protective or aggravating role of the oral cavity in the infectivity and progression of COVID-19 has been controversial. Recent scientific evidence suggests a role that could be viewed from three different angles.

Is the oral cavity implicated in the transmission and pathogenicity of SARS-CoV-2?

The infectivity of SARS-CoV-2 depends on the ability of the virus to enter cells using the transmembrane protein angiotensin-converting enzyme (ACE2) as the primary receptor and portal of entry. There is clear evidence that epithelial cells in different oral cavity mucosa show a high expression of ACE2. As the oral cavity is an interface of major importance between the body and its environment, it is highly likely that this route for viral colonisation and infection is critical to the onset of COVID-19. This has clear implications to the spread of the virus in terms of physical barriers (face masks, screens, etc.), aerosol generating procedures in dentistry, and the identification of effective oral antiseptics that may impact the transmission and pathogenicity of the virus. Recent investigations have shown that oral rinses based on povidone iodine and Cetylpyridinium chloride have virucidal capabilities and may be used to limit the transmission of COVID-19. Clinical trials are, however, required to verify this hypothesis.
Untreated periodontal pockets in patients with periodontitis chronically maintain high numbers of periodontal pathogens with the capacity to upregulate ACE-2 receptors, hence increasing the infectivity of the SARS-cov2 virus. Periodontitis, causing ulceration of the gingival epithelium and weaken of its protective function, may therefore increase the risk of infection SARS-CoV-2 via the oral cavity. Also, periodontitis may increase the risk of infection indirectly by upregulating the expression of ACE2. Periodontal pathogens, such as Capnotytophaga and Fusobacterium nucleatum have been shown to up-regulate the infectivity of SARS-CoV-2. As there is a high prevalence of these pathogens in open pockets in patients with untreated periodontitis, they may impact viral infectivity and infection rates.



What is the impact of periodontal diseases as a risk of increased severity in COVID-19 patients?

Until recently there was no evidence that patients with periodontitis had an increased risk of severe COVID-19. However, a study published in 2021[1] evidenced that periodontitis may be found to be significantly associated with a higher risk of complications from COVID-19. These complications, linked to the so-called 'cytokine storm', include admission to an intensive care unit (ICU), need for assisted ventilation and death. This study was conducted using data from the national electronic health records of the State of Qatar, including 568 COVID-19 patients. After adjusting for potential confounders, periodontitis was significantly associated with death (odds ratio (OR)=11.17), assisted ventilation (OR=4.03) and ICU admission (OR= 3.57) compared to controls. It was concluded that periodontitis patients are about 10 times more likely to die, 4 times more likely to need assisted ventilation and about 3.5 times more likely to be admitted to an ICU if infected with COViD-19.

What is the impact of periodontal diseases as a risk of death in COVID-19?

Another possible association between periodontal health and COVID-19 severity involves the well-established connection between the oral microbiome and respiratory diseases. Periodontal pockets and poor oral hygiene in elderly patients with periodontitis may provide a source of microorganisms which may enter the respiratory tract and cause pneumonia, specifically in patients who are hospitalised and in need of assisted ventilation. Since bilateral pneumonia and need for assisted ventilation are key indicators of COVID-19 severity and increased risk of death, there is a clear risk of potentially fatal pulmonary disease in COVID-19 positive patients with periodontitis. Furthermore, opportunistic oral pathogens such as Capnocytophaga, and Veillonella, have been found in the bronchoalveolar fluid of the COVID-19 patients. These pathogens may aggravate the hypoxia observed in COVID-19 and upregulate ACE-2 receptors in the alveolar cells, thus facilitating infection and impact of the viral disease.

In summary, periodontal diseases, mainly periodontitis have been shown to be a co-factor in increasing the infectivity and severity of COVID-19 disease. This highlights the impact of periodontitis on patients with acute respiratory conditions. ■

Reference

[1] *Marouf N, Cai W, Said KN, et al. Association between periodontitis and severity of COVID-19 infection: A case–control study. J Clin Periodontol, 2021;48:483–491.*

Further references available on request.

Dental professionalism in a changing world

In seeking to discuss the nature of professionalism, it is important to understand what constitutes a profession. The academic study of professionalism suggests historically that becoming a profession involves possession of an organised body of knowledge with intellectual and practical applications.

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This knowledge is needed by the community and so the profession is given authority to practice, and serve the community, within a code of practice which places the interests of the client/patient/student first. In return, professions have been enabled largely to self-regulate, and to determine who can become members and have access to the knowledge, social legitimacy, and market rewards of the profession.

Identifying as a profession confers social, moral, and political status. It is widely agreed that dentistry meets the criteria of being a profession. In this context, professionalism relates to the professional code which lays out the expectations of how those admitted to a profession should behave, and the standards to which they should be held accountable to maintain the trust of the public whom they serve. This paper explores professionalism within dentistry and contextualises the changing global environment in which dentistry is being practiced, and the potential impacts on dental professionalism. Moving from the origins of professionalism within healthcare, to the recent changes promoting transparency and specificity, we finish by asking how current understandings of professionalism fit the changing nature of dental care and of dentistry itself.

A brief history

The Hippocratic oath (c.400BCE) provided a foundation of values that underpinned western medicine for many centuries, with a focus on avoiding harm and injustice to patients which persists today. The modern Anglo-American Medical associations which established themselves in the 19th Century built on this to devise codes of ethics grounded in service, and responsibility for the sick (Table 1). These ethical codes persisted despite a decline in public trust for healthcare professionals through the twentieth century. By the 1980s the marketisation of healthcare in the USA precipitated a renewed interest in professionalism and what it entails, partly brought about through recognition of the potential threat of commercialisation to professional ideals of ethics and service. For US dentistry this culminated in a 2006 summit on commercialism hosted by the American Dental Association which identified areas of commercialism which could be a potential threat to professional practice.

While healthcare in the UK was protected to a certain extent by the National Health Service and more limited opportunities for marketisation of healthcare (until very recently) a growing concern for practitioner integrity was also apparent, largely stemming from very visible healthcare system failures outlined below. Within the dental context there was also a growing awareness that unlike other aspects of healthcare dentistry in the UK, as is the case across most of Europe, is performed mainly in a business context. This has important ethical implications, which led to calls for new codes of practice appropriate to modern dental practice.

Dental professionalism defined?

In recent years, professionalism in dentistry has received significant attention with a growing body of work exploring what professionalism means in practice for dental teams. Much of that work has consisted of compiling lists of characteristics or attributes and using these to create guidelines for dental professionals. These lists of character attributes reflect an idea of the 'ideal' dental healthcare professional, and provide a useful teaching tool for undergraduates, as they develop their professional worldviews both formally and informally. See, for example, the American Dental Education Association (2009) statement which lists six values central to professionalism in dental educations: competence, fairness, integrity, responsibility and respect. The American Dental Association also provides a code of ethics and professional conduct, as does the General Dental Council in the UK, the Canadian Dental Association and equivalent bodies in

Table 1. Definition of professionalism/codes of ethics.

Authors/date	Definition of professionalism/Code of ethics.
Brosky et al. 2003	A relationship that promotes a successful relationship with the patient. The patient feels confident in the capabilities of the healthcare provider.
Wellie, 2004	[A profession is a] collective of expert service providers who have jointly and publicly committed to always give priority to the existential needs and interests of the public they serve above their own and who in turn are trusted by the public to do so.
Nath et al. 2006	Higher professionalism may be defined as a service that transcends self-interest and manifests when the task is poorly defined, solutions are not available or affordable and rendering service is not in one's own best financial, social, or physical interest.
Masella, 2007	[Professionalism is] a life characterized by display of high intellectual, technical, and moral qualities and abilities, in service to patients and community.
American Dental Education Association, 2009	Six values central to professionalism in dental educations: competence, fairness, integrity, responsibility and respect.
Zijlstra-Shaw et al., 2013	Locates a code of professional conduct within the context of the attitudes and behaviours developed and displayed by the dental profession.
General Dental Council UK, 2014	Nine principles: Put patients' interests first; Communicate effectively with patients; Obtain valid consent; Maintain and protect patients' information; Have a clear and effective complaints procedure; Work with colleagues in a way that is in patients' best interests; Maintain, develop and work within your professional knowledge and skills; Raise concerns if patients are at risk; Make sure your personal behaviour maintains patients' confidence in you and the dental profession.

most other countries. Further to this, Zijlstra-Shaw, Roberts et al. (2013), developed a model of professionalism within dental education which locates a code of professional conduct within the context of the attitudes and behaviours developed and displayed by the dental profession. While there is still debate about the exact nature and content of a code of professional conduct for dentists, and elements of different practice globally, there is widespread agreement that such a code of practice is needed, perhaps more so than ever.

Reinforcing professional codes in response to healthcare system failures

Debates on professionalism across healthcare in the UK, to which we have already alluded, have been triggered by dramatic individual, organisational and system failures over the past two decades. Exposed by the media and lawyers, in response to the concern of relatives or individual clinicians, there have been several high-profile cases and extensive investigations over the past three decades. These have ranged from a general medical practitioner systematically murdering his older patients to paediatric cardiac surgeons operating with poor surgical outcomes, to the retention of body parts of deceased children without consent. System-level failures have also been exposed, regarding the prolonged suffering and indignity of older and disabled people. Failures which required relatives of vulnerable patients and/or health professionals to raise concerns externally because senior people within the system were not willing to hear or act or put the business of healthcare before patients' welfare.

These, and other similar, significant failures are a driving force for change. Detailed reports have been published outlining recommendations which include the need for awareness, accountability and transparency, protection for whistle-blowers and demonstrable professionalism as a protection against future incidents. While the examples here come from the UK, transparency and protection for whistle-blowers are also being promoted in other countries including Australia, Ireland, and Canada.

The need for transparency has resulted in professionalism, including codes of ethical standards, becoming more explicit within dentistry. Codes of practice have moved from absolutes to principles which provide a framework for decision making. We see these in relation to dental research, through the International Association for Dental Research (IADR), and increasingly in education as well as in clinical/professional practice. Codes of practice need to be visible, specific, and practicable, as can be seen in recent statements and codes such as those released by the American Dental Education Association (2021), and Council of European Dentists (2017).

Changes to regulation

Whereas historically, a key feature of professions was that professionals were self-regulating, it is increasingly recognised by governments and society that self-regulation alone is no longer appropriate or acceptable in healthcare. This doesn't mean that individuals shouldn't regulate themselves (in fact all the evidence suggests that individuals should and must) but that the profession should be open to external influence and scrutiny.

Within the United Kingdom, all regulators are now overseen by one arm's length government body and professionalism is promoted actively. The UK Health Professions Council ▶

suggests that professionalism may be better regarded as a meta-skill of situational awareness and contextual judgement allowing individuals to draw on a range of communication, technical and practical skills, and apply the appropriate skills for a given professional scenario. And the scope of professional scenarios is expanding with the changing context of dentistry and dental care.

Societal and cultural change

In a neo-liberalistic society which embraces commercialism, patient and public expectations from health professionals are much greater than previously. The nature and practice of dental care is changing. Person-centred care is increasingly advocated with shared decision making and participation in clinical decision making as central tenets of person-centred practice. Patients have access to information and knowledge via the internet that would previously only have been available to dental care professionals and are expected to be informed and play an active role in their care. Person-centred dental care involves understanding the context in which patients experience oral health issues and managing patients' emotions, not just their health condition – this is particularly important for dentistry as many people are anxious about receiving dental care.

Communication underpins person-centred practice and is increasingly important within dental care. Patients are more likely to sue health professionals than ever before, when they are not happy with outcomes, or feel that they have not been dealt with as they would wish This is impacting on the health and wellbeing of some professionals who suggest that they are practicing more defensively.

The changing nature of dentistry and dentists

Patient expectations are changing but dentistry itself is also changing in ways which have implications for professionalism:

1. Demography: First, the profile of dentists has changed dramatically. Whereas previously, in most countries, dentistry was largely a male preserve, in line with university education in general, the number of women in the profession is increasing significantly with women now outnumbering men, particularly in the global north. There have also been initiatives to improve socioeconomic and ethnic diversity to support the profession to better represent the populations which it serves. Increasingly diverse dental teams will require the profession to challenge assumptions and behaviours which they may not otherwise have been aware of.

2. Teamworking: As the scope of practice increases and tasks are increasingly delegated and delivered by other members of the dental team, four-handed dentistry is becoming the norm and in many countries the skill mix of the dental team is expanding. This requires dentists to embrace teamworking and explore their values, behaviours, and relationships in a more overt way, with colleagues as well as patients.

3. Life-long learning: Such is the pace of research and development that health professionals face a significant challenge in keeping knowledge and skills up to date and ensuring the delivery of evidence-based or evidence-informed dentistry. Not only does this involve potential changes in specific treatments but also how care is combined to provide high quality contemporary dentistry that meets the needs of increasingly informed patients.

4. Business of dentistry: It is increasingly recognised that professionalism cannot ignore the business of dentistry – something that is not discussed as often as it should. And yet this is one of the areas where patients raise concerns over professionalism as they want clarity over the cost of care, the need for specific items of care and alternatives so that they can make informed decisions about their finances, as well as their health care within their own value systems.

5. Lifestyle and social media: There has always been the expectation that the lifestyle of health professionals should be in keeping with their status. With the growth of social media, and the ubiquitous mobile phone camera, private lives are more public than ever. Social media – from Facebook to Twitter, Instagram to Tik Tok - has brought new challenges and opportunities to dentists, particularly for younger generations who are more active on a range of platforms and have grown up with a social media presence. This brings with it a pressure to be professional at work and in person but also at home and in the virtual world.

6. Pressures in dentistry: There are concerns that multiple pressures are impacting on the relationship between patients and clinicians with implications for health and wellbeing in dentistry and that professionalism should be strengthened to ensure that this is addressed.

7. Needs and expectations: Increasingly in developed countries dental care is shifting focus to meeting expectations rather than, or at least alongside, health needs. Patient preference for preventative therapies and aesthetic treatments is potentially changing the profile of dentistry.

It's important to stress that the changes outlined here, both in relation to patient care and dentistry itself, are UK centred. That said, many of the themes are global in reach and their impacts on professional practice are likely to be global too.

Taking a global perspective

Dentistry is a global profession. Whilst there have been several initiatives to align competencies and curricula across countries there will inevitably be some variation in the scope of practice of dentistry and in how it is practised. This will depend on the legal, cultural, and regulatory context recognising that in some countries dentists and other dental professionals are largely unregulated, some countries rely on self-regulation and in some professions are managed directly or indirectly by government. Legislation and guidance will vary – as has been clearly exemplified in relation to infection prevention and control and the delivery of clinical care during the current pandemic. As nation state expectations will vary, so too will expectations from the public and patients in that context.

Fig.1: Learning outcomes for the Dental Team. Source: Preparing for practice, The General Dental Council UK, 2015.

Movement to study or practise in another country is possible but whilst the former depends on personal or state sponsorship, the latter often involves taking national or state examinations. Increasingly the curricula reflect the importance of professionalism, and it is important to reflect on the context in which dentistry is practised. Dentists moving context should be encouraged to reflect on what is required to meet the standards of their current or future context and how this might change their practice.

Implications for education and training

Considering the above, it is vitally important that professionalism is a core part of the undergraduate curriculum for dentists and the wider dental team. Knowledge of the ethical, legal/regulatory, and professional basis of dentistry is essential to clinical practice. The American and European associations responsible for dental education have embraced the concept of professionalism and are wrestling with how it can best be taught, modelled, and assessed. In the UK the General Dental Council publishes guidance for the undergraduate curriculum across the dental team which has four distinct domains, leadership and management, communication and professionalism firmly underpinning clinical care (Fig. 1). Learning outcomes for professionalism have been considered in four sections: Patients and the public, Ethical and legal, Teamwork, and Development of self and others. In contrast, the American Dental Education Association (ADEA) looks at Competence, fairness, integrity, responsibility, respect and service minded-ness.

Case studies to help guide teachers and students through aspects of professionalism, including accountability, consent, and candour are available online and a useful resource for everyone. See: www.gdc-uk.org.

In conclusion

Professionalism as a concept and practice is geographically and historically contingent. There are multiple definitions and codes linked to professionalism across healthcare and within dentistry itself. As dentists, you observe the code of conduct laid out for you as a professional within the context in which you practice. But you also interpret and enact that code and the value judgements inherent within it. We challenge you to think about what professionalism means for you, and why. How do you put your code into practice in your day-to-day clinical practice, in your working life, in your personal life and in your virtual life? And in the era of transparency and teamworking what do you have in place to ensure that you and your team demonstrate values, behaviours and relationships that underpin the trust that patients and the public hold in dentists? How does this relate to what is expected of you in the country in which you practice, by your professional associations and regulator? The following suggestions may be helpful in addressing these questions.

- Reflect personally: on your values, behaviours, and relationships within work and across your personal life.
- Identify and manage risks: personal, team, environment, and systems which may involve change, training and development, but will most certainly involve debate within your teams or organisations. The importance of working upstream to prevent problems arising on the one hand and learning from failure on the other are clearly evidenced.
- Model and promote professionalism: whether you are involved in education or not, you are likely to engage with dental professionals in the early stage of their career. Modelling professionalism will be helpful along with mentoring them in thinking through how they strengthen their professionalism and prepare to manage complex situations.
- Engagement with the public and patients: Encourage and engage in debate with the public about their realistic expectations for dental care and assist in rebalancing professional relationships. ■

References available on request

Modern, conservative management of tooth wear

Tooth wear is an age-related phenomenon, resulting from the exposure of the dental hard tissues to chemical and mechanical challenges. 'Physiological wear' is the process that results in wear rates associated with normal function, according to the age of the patient. It has been reported to be in the order of 11-29 µm of hard tooth tissue loss per year.

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Amongst patients presenting with atypical tooth wear, possibly related to parafunctional habits, higher rates of progression have been described -between 60–140 µm of hard tissue loss per year. Tooth wear becomes 'pathological' when it impacts on the oral health and quality of life of the patient, causing, amongst other problems, tooth sensitivity, dental pain, compromised aesthetics, and functional challenges. Clinical studies of patients presenting with severe tooth wear, which may not be pathological, report limited progression of wear during periods of observation, indicating that the wear process is episodic, with periods of high and low wear rates. Consequently, when seeing a patient with a severe loss of tooth material for the first time, it may not be obvious that the tooth wear is active and progressive.

Any recommendation or inclination to undertake restorative interventions for new patients presenting with severe tooth wear should be resisted. The decision to intervene should be based on the assessment of a plethora of factors, not simply the appearance of the teeth and the perceived rate of wear. These factors include any problems with function and aesthetics, the extent to which these concern the patient and any specific requests for treatment. In the absence of a pressing need to commence restorative care, preventive interventions and monitoring the progression of wear should take precedence.

Aetiological factors

Traditionally the aetiology of tooth wear has been described as being 'erosion', 'attrition' and 'abrasion'. Erosion refers to the exposure of tooth surfaces to an acidic environment, attrition the wear resulting from tooth-tooth contacts, and abrasive wear the application of mechanical forces, such as overzealous tooth brushing, the use of abrasive dentifrices, nail- and pen-biting etc. Based on current best available evidence, consensus opinion is that pathological and severe tooth wear have complex multi-factorial aetiologies, with large inter-individual variation. The authors have proposed the use of an approach to help better understand and communicate the wear process (Fig. 1).

Diagnosis and shared decision making

Assessment of tooth wear should form part of routine dental examinations, including recognition of tooth wear which is excessive for the age of the patient, patient

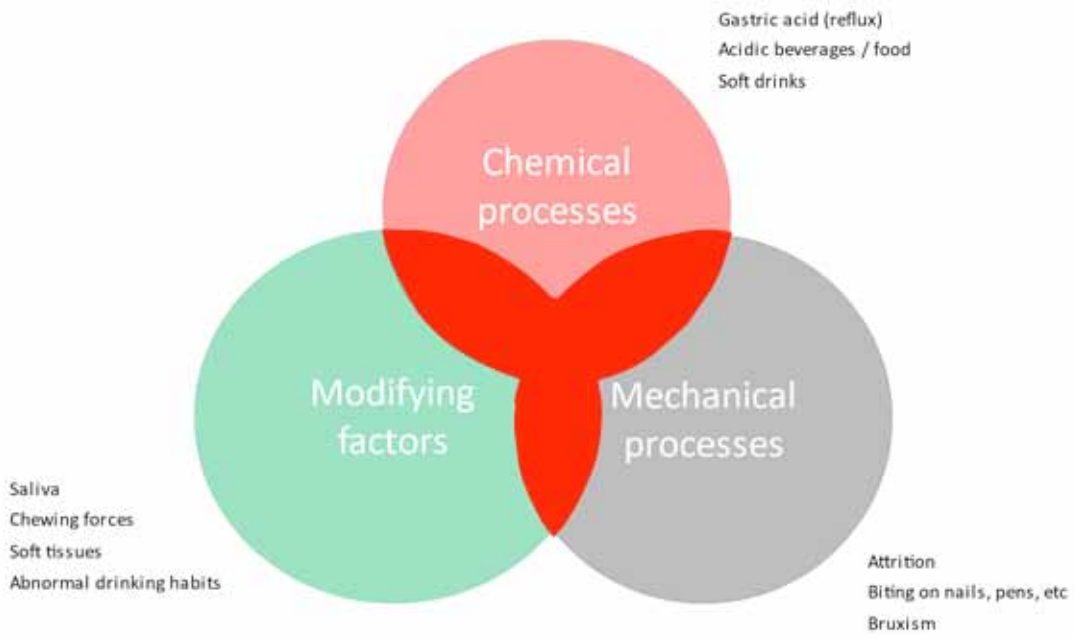

Fig. 1: Schematic of the aetiology of tooth wear.

concerns, and any request for treatment of the condition. If the presenting tooth wear is assessed to be pathological or severe, the patient should be advised accordingly, with the aim of ensuring that the patient develops a proper awareness and understanding of the condition. Moreover, a thorough anamnesis, including detailed medical and dental histories, lifestyle assessment and the recognition of any parafunctional habits is required to relate tooth wear to possible aetiological factors. The decision to undertake any treatment should be based on a shared decision-making process with the patient, including consideration of the following:

1. Patients with tooth wear should be considered as 'higher-risk' for complex restorative dental treatments. Restoration failure rates in patients with pathological destruction of their dentition are likely to be higher than those in 'normal' patients. Restorative rehabilitation may, therefore, be associated with a significant risk of early restoration failure and the associated consequences, and disappointment for the patient and clinician. Patients must be carefully advised of the risks and the likely prognosis of any proposed treatment. Treatment expectations must be realistic, with the patient's understanding that any form of restoration may suffer the same fate as the natural dentition, especially if the factors causing the wear are not kept under strict control – once a wear patient, always a wear patient.

2. There is a place for monitored, preventative care only in patients with severe tooth wear when there are no functional problems, and the patient is unconcerned about the appearance of the worn teeth. Notwithstanding the patient's time and costs, treatment in such cases may result in highly adverse outcomes, especially in the event of failure of unnecessary restorations, possibly threatening the vitality, if not the prognosis of remaining teeth.

Counselling and monitoring

Whenever severe or pathological tooth wear is present and there are no indications for restorative intervention, the best treatment option is counselling and monitoring. As part of effective counselling and monitoring, the patient must develop a clear understanding of their condition and be supported and encouraged to control any unconscious behaviors, such as clenching habits, reflux problems, etc. that may be contributory to the wear of their teeth.

What is counselling and what to do?

- Counselling involves informing the patient of the presence of their tooth wear, explaining the possible causes and establishing a bespoke preventive programme.
- Counselling requires the identification of the most likely aetiological factors. Based on the clinical appearances, the clinician should aim to determine whether the cause of the wear is more related to the phenotype, 'mechanical', 'chemical,' or a combination. In the presence of a likely mechanical phenotype, history taking may be focused on bruxism (clenching, grinding) toothbrushing technique etc. For a chemical phenotype, patient questioning may be focused on their diet, external acidic exposure (erosive beverages) and internal acidic exposure (vomiting and reflux).
- An effective preventive plan should aim to eliminate, or at least control the most likely aetiological factors. The patient must take responsibility for the prevention of their tooth wear and accept the risks of failing to do so. The bespoke preventive plan may include splint therapy, referral to a specialist for treatment of reflux, dietary counselling, advice to refrain from, or how to control parafunctional and specific eating and drinking habits. As a result, counselling should aim to secure the patient's commitment to the ownership of the problem and develop an awareness of the measures necessary to control, if not eliminate the wear.

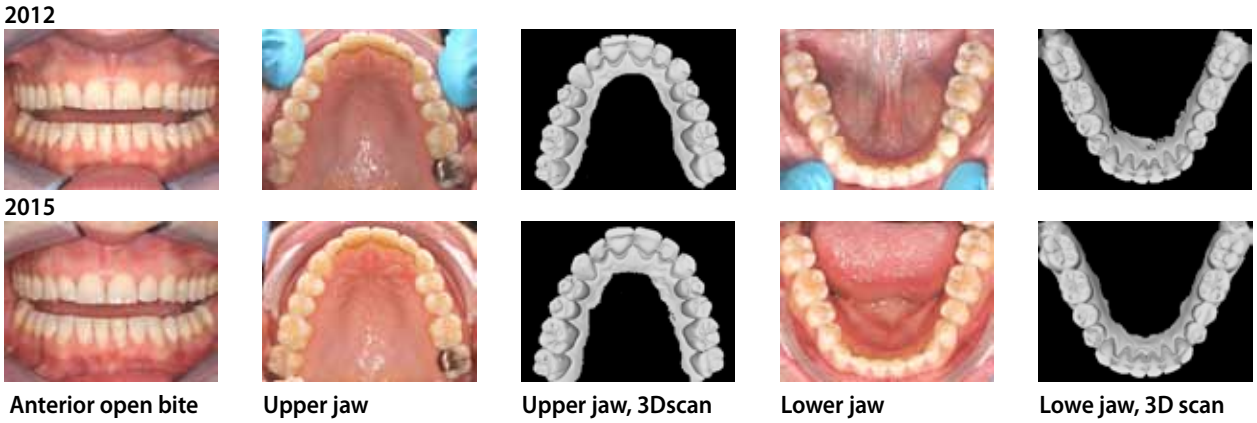

Fig. 2: A 38-year-old female patient. Casts confirm limited progression of tooth wear over a 3-year period.

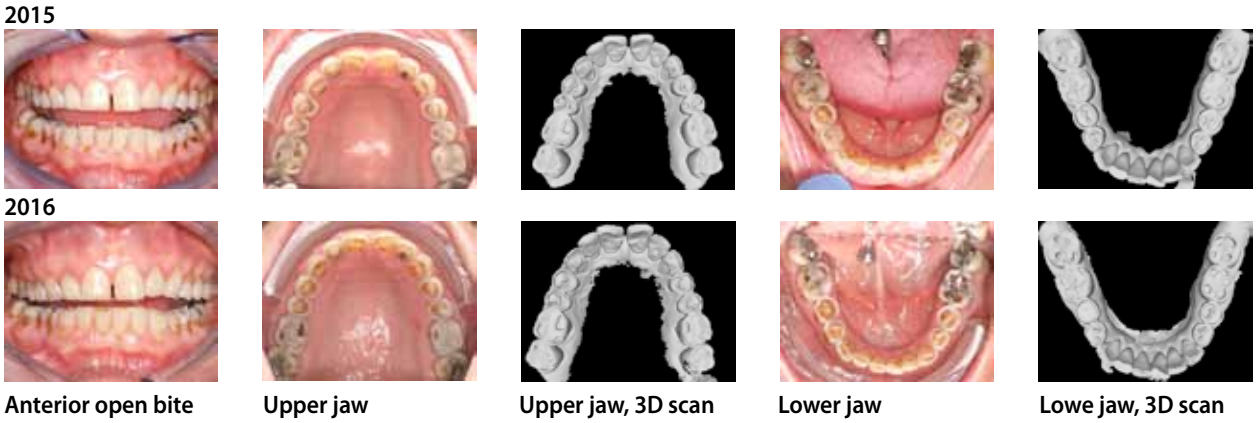

Fig. 3: A 50-year-old female patient. Progressive wear was observed over a 4-year period. The principal aetiological and modifying factor was xerostomia. Initially, there was no need or demand for restorative intervention. After three years, the patient began to experience increasing difficulties necessitating intervention.

What is monitoring and what to do?

- Monitoring involves the objective assessment of the level of tooth wear present, and its progression with time. Dental index systems such as the Tooth Wear Index (TWI) or Basic Erosive Wear Examination (BEWE) can be used. Our advice is that monitoring the progression of wear is best done using casts or 3D intra-oral scans.
- Monitoring will ascertain if the tooth wear is progressing or stable. Monitoring can confirm to both patient and clinician that restorative treatment is not necessary, help them develop an awareness of the progressive nature of the wear, and, where indicated, engage the patient in the treatment planning decisions.

Often, the progression of tooth wear is less than initially expected. In most cases the advice is to obtain a new set of casts, or to repeat digital scans every 2-3 years, or whenever a functional or aesthetic problem is reported (Fig. 2). When examining a series of casts or scans the enlargement of wear facets may be readily observed. Based on the observations, monitoring may be continued, alterations may be made to the preventive programme, or restorative treatment recommended. Tooth wear is typically episodic and relatively slow. In some cases, however, the wear can be rapid (Fig. 3).

Restorative intervention is indicated when: the patient is experiencing pain or discomfort, the wear is a clear concern for the patient and the clinician, there are functional problems or unacceptable aesthetics, and delay may make the technical execution of the treatment all the more demanding through lack of remaining tooth tissue to support and retain restorations.

Minimally invasive restorations

In accordance with the European Consensus Statement on the Management Guidelines (for Severe Wear), restorative treatment should wherever possible be conservative and of an "additive" rather than "subtractive" nature. This reduces the need for the further loss of healthy tooth tissue and unwanted pulp pathology (commonly associated with conventional, mechanically retained restorations). This approach logically includes adhesively retained, minimal intervention restorations. In most tooth wear cases, restorative treatment is likely to require an increase in the occlusal vertical dimension (OVD) to provide the intra-occlusal space required to accommodate the proposed dental restorations. An increase of <5mm may be justified. In patients with severely worn dentitions, specifically with clear signs of bruxism, it is prudent to provide robust restorations of sufficient volume and thickness. Direct res-

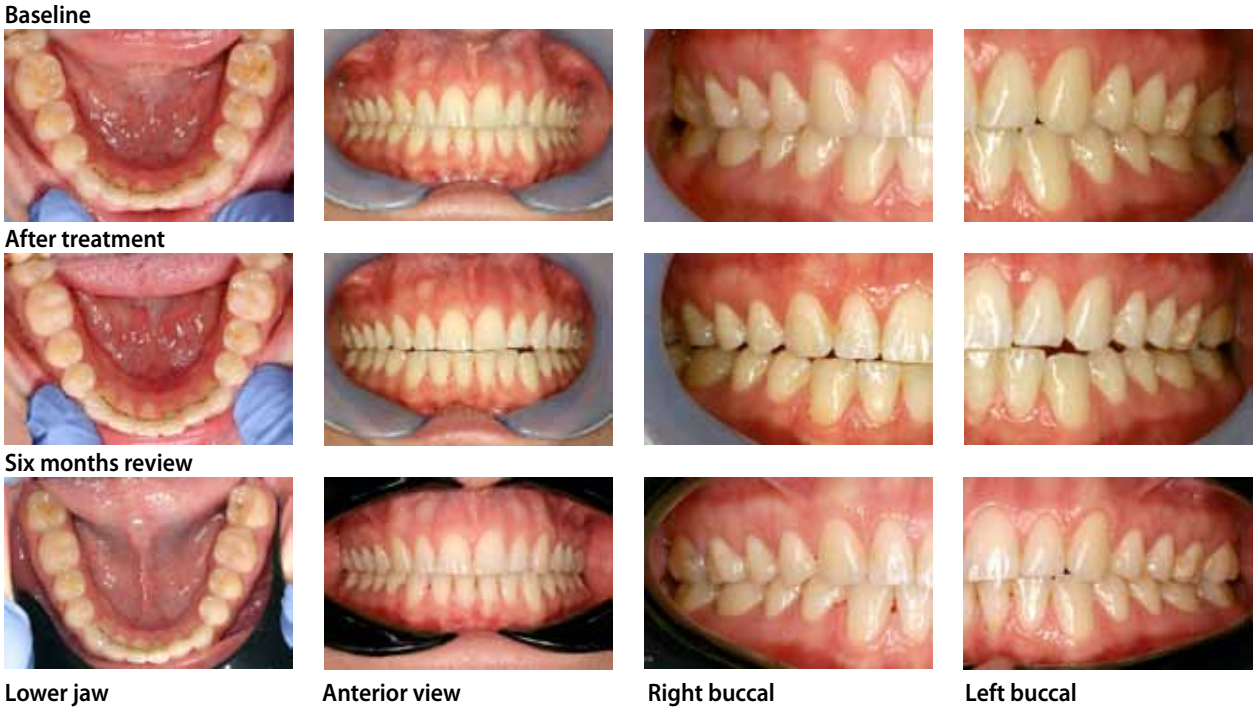

Fig 4: Pathological wear limited to teeth #36 and #46. These teeth were sensitive to cold, causing functional problems. 'Non-prep', minimal intervention, direct composite restorations were placed on both teeth, creating an increase in the vertical dimension of the occlusion. After six months the occlusion was re-established, with resolution of the functional problems.

torations using composite resins and modern adhesives have been shown to be robust with low failure rates. This approach has the added advantage of protecting and preserving the underlying tooth structure, facilitating subsequent contingency planning, repairs or, where indicated clinically, replacement restorations in striving to give the patient lifelong oral function.

Full or partial restorative treatment?

Apart from the choice of minimal intervention techniques, considerations of treatment options should include 'partial-mouth' rehabilitation, anticipating occlusal adaptation and the re-establishment of occlusal contacts, based on the Dahl principle. Literature on the application of the Dahl principle is largely focused on the management of localized anterior wear. The principle may, however, be applied in the management of localized posterior wear (Fig. 4).

Conclusion

Despite advanced tooth wear involving dentine, restorative intervention is not always required. Intervention is indicated in the presence of pain or discomfort, functional difficulties, or compromised aesthetics that may adversely impact quality of life. Otherwise, counselling and monitoring is the first-choice option for the management of advanced tooth wear. Where intervention is indicated, the longevity of traditional restorations may be limited. Recommendations for restorative rehabilitation in all severe tooth wear cases are not evidence-based.

When embarking upon a course of restorative care in the management of pathological or severe tooth wear, it is strongly advised to follow the philosophy of conservative, pragmatic, minimally invasive intervention. Restorative rehabilitation should only be undertaken when the patient demonstrates the necessary understanding and motivation to maintain and conserve the completed rehabilitation and accepts the risks involved. In all other cases, monitoring and counselling should be the standard of care. Moreover, as a rehabilitation is unlikely to last a lifetime, depending on the age of the patient, a minimal intervention restorative approach is advised, offering the opportunity for contingency planning, repairs and, where indicated clinically, replacement restorations in the quest to maintain oral function for life. ■

Key references

- *Loomans B, Opdam N, Attin T, Bartlett D, Edelhoff D, Frankenberger R, Benic G, Ramseyer S, Wetselaar P, Sterenborg B, Hickel R, Pallesen U, Mehta S, Banerji S, Lussi A, Wilson N.Severe Tooth Wear: European Consensus Statement on Management Guidelines. J Adhes Dent. 2017;19(2):111-119. doi:10.3290/j.jad.a38102.*
- *Mehta SB, Lima VP, Bronkhorst EM, Crins L, Bronkhorst H, Opdam NJM, Huysmans MDNJM, Loomans BAC. Clinical performance of direct composite resin restorations in a full mouth rehabilitation for patients with severe tooth wear: 5.5-year results. J Dent. 2021 Sep;112:103743. doi: 10.1016/j.jdent.2021.103743. Epub 2021 Jul 3. PMID: 34229000.*
- *Poyser NJ, Porter RW, Briggs PF, Chana HS, Kelleher MG. The Dahl Concept: past, present and future. Br Dent J. 2005 Jun 11;198(11):669-76; quiz 720. doi: 10.1038/sj.bdj.4812371. PMID: 15951771.*

Further references available on request.

The future of Dental Materials Science

Globally, materials innovation for dentistry is a thriving, ongoing reality. As a high-level classification, we may distinguish the goals of: Caries Prevention, Restoration/Repair, Reconstruction and Regeneration.

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During a pandemic, prevention of viral infection is an added essential goal. Restoration, whether direct or indirect, remains the major focus for most dentists. By reconstruction we envisage the placement of implants for either fully or partially edentulous cases, but also more radical craniofacial reconstruction with titanium plates for patients who have experienced severe trauma. Extensive investigations continue into optimized implant designs regarding their biomechanics and osseointegration. Regeneration is addressed with increasing success in the context of periodontal defects to promote bone re-growth. This often involves scaffold materials wherein bone-cells may grow and proliferate. The more ambitious goals of tissue engineering include attempts to re-grow teeth, although the requisite timescale remains discouraging.

A key event for dental material manufacturers is the biennial International Dental Show (IDS) in Cologne, where the major players aim to promote new products: often developed via a synergy of academic and industrial R&D. These include new restorative materials and associated technologies such as 3D printing. Smaller companies are well represented, particularly those supplying key ingredients for composite materials, such as radiopaque glass powders with different ranges of particle size. Disruptive innovations in the wider fields of chemistry and materials science, typified by the 2D material graphene, are regularly investigated for potential dental applications, although its incorporation in more than minimal concentrations produces formulations that are strong but un-aesthetic.

Within the practice of restorative dentistry, the key factor in clinical success remains operator skill. But this is facilitated by materials with greater user-friendliness and abuse-tolerance.

The science of dental materials is interdisciplinary in nature. The most insightful research publications are generally produced by multi-skilled teams with access to sophisticated equipment. Promising ideas demand first a clear understanding of dental tissues, the oral environment and the real-world constraints upon materials. These minimally include adequate mechanical properties, chemical stability and biological safety.

Since all direct restoratives must be supplied in fluid/paste form, then the efficiency and effectiveness of the hardening/solidification process is critical. Hence what matters is that strength-development must be rapid and there should be minimal – ideally zero – leakage of components into the oral cavity. The integrity and stability of the interface between hard-tissues and materials is crucial, but this can be challenged via stresses induced during placement and in subsequent service. Research in the field requires understanding of adhesive mechanisms, experimental stress measurements and computer modelling of the overall situation to evaluate complex cavity-design geometries and occlusal stresses. Minimally invasive preparations may reduce the need for aerosol-producing interventions. Environmental benefits, such as reduced carbon footprint, may also be achieved by simpler, recyclable means of product presentation and packaging.

Indirect restorations

For indirect construction of inlays, onlays, crowns and bridges intra-oral optical scanning has become a widespread alternative to using impression materials. This trend is welcome since polymeric impression materials are highly stable and biodegrade slowly in the natural environment. Scanners and software have undergone massive development such that dimensionally accurate 3D computer models can be generated of the oral tissues and manipulated on-screen. From these digital 3D images, the desired shape of a crown or other restoration can be established by CAD (computer-aided

design). The next step involves CAM (computer-aided manufacture) either by subtractive (milling) or additive (3D-printing) methods.

The main materials for CAD/CAM indirect restorations are ceramics of various types (Fig. 1).

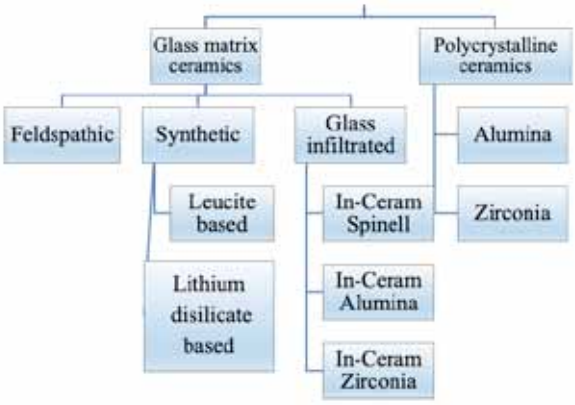

Fig.1: Classification of dental ceramics.

Amongst the glass matrix types, feldspathic ceramics have been superseded, firstly, by the synthetic category in which either 35-45% leucite or up to 70% lithium disilicate crystals are dispersed within the glass matrix to inhibit crack propagation, although they show unfavourable survival rates in the posterior region. Secondly, glass-infiltrated ceramics include the In-Ceram group, from Vita. These consist of three product formulations: Spinell > Alumina > Zirconia of increasing fracture resistance but decreasing translucency.

Polycrystalline ceramics are glass-free and are considered the gold standard for crown frameworks. Their substructure involves densely-packed fine-grain crystals without any intervening matrix forming a solid polycrystalline structure. The result is a strong and tough ceramic much more resistant to microcracks. The Procera AllCeram alumina core (Nobel Biocare; Sweden) was introduced in 1993 as the first pure alumina core used for CAD/CAM.

Zirconia

Zirconium oxide has been successfully used as crowns, fixed-partial-dentures and implants since the 1990s, due to its superior strength. Pure zirconia is monoclinic which transforms with increasing temperature into a tetragonal crystal structure and then to a cubic crystal structure (Fig. 2). Various stabilizing oxides are added to zirconia, such as yttria (Y_2O_3), magnesium (MgO) and calcium (CaO), to stabilize it fully or partially in the tetragonal or cubic phase at room temperature. Yttria-stabilized tetragonal zirconia polycrystals (Y-TZP) are the most used in dentistry as they have the highest strength and fracture toughness after machining and sintering. Their mechanical properties (strength of 1120 MPa) exceed those of alumina-based and lithium disilicate-based ceramics.

Although the above details are widely known, they are necessary to understanding fresh developments - particularly the controversies surrounding the optimal surface treatment of zirconia to achieve bonding to tooth structure. Pre-treatment via air abrasion and/or ceramic primers enhance the strength of the zirconia/cement fitting-surface interface (Franz, et al. 2021). Zirconia restorations commonly involve multiple interfaces with other materials, such as porcelain-veneers bonded to a zirconia core. When the weaker porcelain fails it is vastly preferable to attempt a repair rather than a full-arch replacement. To enhance bonding to the zirconia core, air-abrasion with a fluoroapatite glass-ceramic (FGC) powder is a feasible alternative to CoJet sand.

PICN

Ceramics and composites are the most used materials for dental application. Recently, the characteristics of both were combined as a "polymer-infiltrated ceramic-network" (PICN). This is a structure with a sintered ceramic matrix infiltrated with a polymer matrix. The mechanical properties of the PICN are equivalent to the properties of nanoceramic resins, lower than lithium disilicate glass ceramic and superior to feldspathic porcelain. This is evidently a material highly resistant to degradation at low loads (close to physiological situation) when cemented on a substrate and is an ongoing area of research.

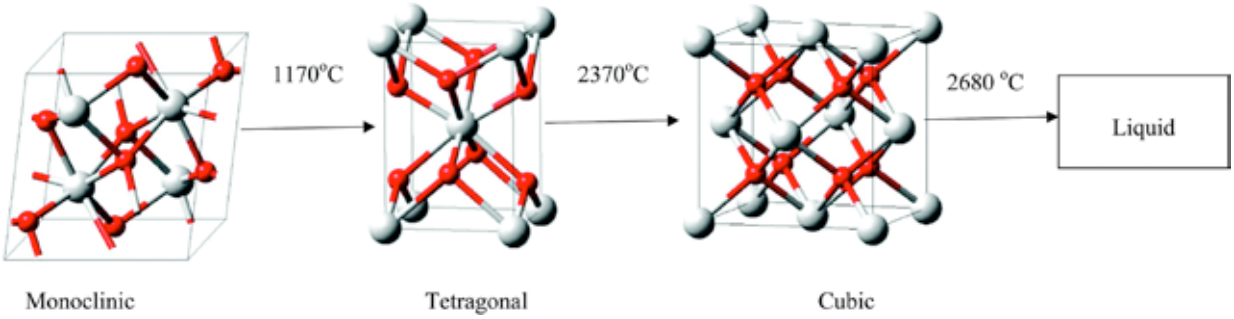

Fig. 2: Crystallographic phase change of ZrO_2 with increasing temperature (Adapted from: Gautam et al., 2016).

Resin-based composites (RBCs) for direct restorations

The general retreat from using mercury-based amalgam has motivated the emergence of dental composite restoratives as the most common standard of care. This is due to their tooth-like aesthetics, retention of sound tooth structure during placement, fast photo-curing kinetics, robust mechanical properties, strong bonding to enamel along with ongoing clinical performance improvements. The global market for these materials is projected to grow at 4.8% annually to a 536 million USD industry by 2024.

Polymer-based dental restoratives have, for decades, been primarily relying on dimethacrylate matrix monomers, denoted by their well-known acronyms: BisGMA, TEGDMA and UDMA. These polymerize by a chain-growth free-radical mechanism associated with several drawbacks. Firstly, limited final conversion of monomer due to early vitrification raises toxicity concerns because the unreacted monomers in the resin matrices are potentially leachable. Secondly, during the photocuring of di-methacrylate monomers, considerable polymerization-induced shrinkage stress may develop, also because of early gelation. High shrinkage stress can lead to restoration failure via reduced adhesion between dentine and restorative. Thirdly, the ester groups within the backbone of the methacrylate monomers are prone to enzymatic hydrolysis, slowly reducing the mechanical properties of the restoratives in the long term, thus shortening their service life and necessitating their replacement. Fourthly, potentially leachable degradation fragments also raise toxicity concerns.

Efforts have been made to modify di-methacrylate formulations, either by designing high molecular-mass and/or urethane-modified di-methacrylate monomers or by incorporating reversible addition-fragmentation chain transfer (RAFT) molecules into the monomer backbone to reduce polymerization shrinkage stress without sacrificing mechanical performance. Such efforts, however, only solve some of the problems of methacrylate-based systems as many are inherent with either methacrylate monomers (e.g., hydrolysis-prone esters) or free radical chain-growth polymerizations.

Nevertheless, incremental improvements have been achieved in the structure /property /performance of dimethacrylate RBCs. These include development and commercial availability of both rapid and ultra-rapid photopolymerizing composites. The required irradiation time of photo-cured composites has been progressively reduced from 60 > 40 > 20 > 10 seconds (rapid cure) and even > 5 > 3 seconds (ultra-rapid cure). Especially in the latter case, this is dependent upon special formulations incorporating more sensitive photo-initiators and using high irradiance light-curing units (LCUs). These innovations have also enabled enhanced depths-of-cure (DoC), with "bulk fill" materials, achieving DoCs of at least 4 mm, although they are only available in a limited number of different colour shades. It is vital to note that optimal material performance can only be achieved by compliance with optimal photocuring protocols.

Alternatives to dimethacrylate monomers

In the past two decades, several approaches have been explored to develop alternatives to the poly(methacrylate)-based dental restoratives. For example, an epoxy-based siloxane/oxirane or silorane system was shown to generate lower shrinkage than di-methacrylate-based resins, evidently due to the compensation effect resulting from the opening of the strained oxirane ring. Nevertheless, this material was not a commercial success, mainly due to the necessity of special chemistry for the associated adhesive.

Step-growth polymerizations, such as radical-mediated thiol-ene photopolymerizations, have received attention as alternative dental restorative materials in recent years due to: (i) commercial availability of a wide range of both thiol and ene monomers, (ii) their robust photo-curing kinetics that are comparable to the free radical polymerizations of (meth)acrylates, (iii) reduced shrinkage stress due to delayed gelation in step-growth polymerizations and (iv) formation of more homogeneous and tougher networks because of the more uniform matrix network formation.

Filler systems and nanotechnology

Along with the matrix monomer system, RBCs incorporate substantial proportions of mainly particulate filler, mostly coated with a silane-coupling agent. In the past three decades, this was the dominant aspect of RBC research. The situation has stabilized in so far as most major RBCs can be classified as "nano-hybrid" incorporating nanoparticles (diameter: 10 – 100 nm) along with larger radiopaque particles with mono- or bi-modal size-distributions in the range 0.5 to 2 Mm. However, the word "nanotechnology" is sometimes abused in the dental field, often for inappropriate marketing purposes. Where possible, nanoparticle use should be minimised for environmental reasons.

RBC product families

New indications, such as more extensive restorations with cusp replacement, are being developed for RBCs. This is no longer possible with a single universal composite and has led to the development of composites with special indication areas and thus to the introduction of complete 'product families'into the portfolio of manufacturers of direct restorative materials. These include normal (layerable) composites, flowable, bulk-fill and bulk-fill flowable composites. The advantage of product families, additional to their comparable curing times, are their versatile handling characteristics and the intercombinability of the materials. They differ regarding the individual application factors, such as: cavity size, tooth position, clinical situation, compliance, aesthetics and

requisite placement time. There are several commercially available resin-composites incorporating glass-fibres. Some have high aspect ratio (long) fibres, embedded in a resin paste that can be used in prosthodontic applications to created multi-unit frameworks. At present, this is a niche market but a lively research area.

Dentine bonding

Although there have been several attempts to manufacture and market self-adhesive RBCs, these have not been successful. To achieve "auto-adhesion" to dentine, composites must incorporate acidic monomers. Such monomers make the resin-matrix hydrophilic, resulting in hydrolytic property degradation. It is fighting against the laws of physical chemistry! Moreover, there is little incentive to pursue this approach since "conventional" dentine-bonding agents work well, with fewer steps and often ingenious delivery systems. Nevertheless, there is ongoing intensive research into additives that will inhibit MMPs (matrix metalloproteases) that, once activated by acid-etching, can degrade the interfacial hybrid layer.

Glass-ionomer cements and bioactivity

Glass-ionomer cements (GICs) continue to have a role in clinical dentistry. However, the pace of research into advanced formulations has greatly reduced. The same applies to resin modified GICs. Although GICs are self-adhesive to oral tissues, they have a very low cohesive strength. However, there are several Japanese RBC products, popular in SE Asia, that incorporate fluoride-releasing filler particles formed by pre-set and pre-ground GIC.

The dilemma with any restorative material that releases significant components intra-orally is that its structural integrity is inevitably weakened. However, there is currently great interest in formulating products with potential bioactivity. But it is increasingly recognised that, on any sound definition, bioactivity must be demonstrably more than the ability to leach calcium and phosphate ions into the oral environment. Nevertheless, biocompatibility is seen to be a quality with positive characteristics - rather than simply absence of biological hazard. ■

Key references

- V Rosa, D Ho, R Sabino-Silva, WL Siqueira, N Silikas. (2021). Fighting viruses with materials science: Prospects for antivirus surfaces, drug delivery systems and artificial intelligence. *Dent Mater* **37**: 496-507.
- P Ausiello, P Franciosa. M Martorelli, DC Watts (2012). Effects of thread features in osseo-integrated titanium implants using a statistics-based finite element method. *Dent Mater* **28**: 919-927.
- ME Draenert, C Martini, DC Watts, K Draenert, A Wittig-Draenert (2020). Bone augmentation by replica-based bone formation. *Dent Mater* **36**(11): 1388-1396.
- A Della Bona, V Cantelli, VT Britto, KF Collares, JW Stansbury (2021). 3D printing restorative materials using a stereolithographic technique: a systematic review. *Dent Mater* **37**: 336-350.
- FF Demarco, MB Corrêa, MS Cenci, RR Moraes, NJM Opdam (2012). Longevity of posterior composite restorations: Not only a matter of materials. *Dent Mater* **28**:87-101.
- P Ausiello, S Ciaramella, M Martorelli, A Lanzotti, A Gloria, DC Watts. (2017). CAD-FE modelling and analysis of class II restorations incorporating resin-composite, glass ionomer and glass ceramic materials. *Dent Mater* **33**: 1456-1465.
- D Rekow (2019). Digital dentistry: The new state of the art — Is it disruptive or destructive? *Dent Mater* **35**: 9-24.
- C Gautam, J Joyner, A Gautam, J Rao, R Vajtai. (2016) Zirconia based dental ceramics: structure, mechanical properties, biocompatibility and applications. *Dalton Transactions*, **45**(48): 19194-19215.
- A Franz, O Winkler, S Lettner, S Öppinger, A Hauser, M Haidar, A Moritz, DC Watts, A Schedle (2021). Optimizing the fitting-surface preparation of Zirconia restorations for bonding to dentin. *Dent Mater* **37**: 464-476.
- DC Watts, N Silikas. (2005) In Situ Photo-Polymerisation and polymerisation-shrinkage phenomena. *Dental Hard Tissues and Bonding*: G Eliades *et al.* (eds). Springer-Verlag. Heidelberg. Pp. 123-153.
- MS Maas, M Soeiro, Y Alenia, LC Natale, MC Rodrigues, DC Watts, RR Braga. (2017). Trends in restorative composites research: what is in the future? *Braz. Oral. Res.* **31** (suppl): 23-36.
- JW Stansbury (2012). Dimethacrylate network formation and polymer property evolution as determined by the selection of monomers and curing conditions. *Dent Mater* **28**:13–22.
- M Al-Jawad, O Addison, S Sirovica, S Siddiqui, RA Martin, DJ Wood, DC Watts. (2018). Intracoronal stress transfer through enamel following RBC photopolymerisation: A synchrotron X-ray study. *Dent Mater* **34**: 1426-1439.
- DC Watts, H Algamaiah (2020) Characterizing surface viscoelastic integrity of ultra-fast photo-polymerized composites: Methods development. *Dent Mater* **36**: 1255-1265.
- H Algamaiah, N Silikas, DC Watts (2021). Polymerization shrinkage and shrinkage stress development in ultra-rapid photo-polymerized bulk fill resin composites. *Dent Mater* **37**: 559-567.
- KD Jandt, DC Watts (2020) Nanotechnology in dentistry: Present and future perspectives on dental nanomaterials. *Dent Mater* **36**(11): 1365-1378.
- KA Althaqafi, J Satterthwaite, N Silikas (2020). A review and current state of autonomic self-healing microcapsule-based dental resin composites. *Dent Mater* **36**: 329-342.
- PK Vallittu, AR Boccaccini, L Hupa, DC Watts (2018). Bioactive dental materials - Do they exist and what does bioactivity mean? *Dent Mater* **34**: 693-694.

The European Federation of Conservative Dentistry

The EFCD is a non-commercial, non-profit making organisation, which prime object is to contribute to the promotion of oral health in the public interest by encouraging excellence in the clinical practice, teaching and research pertinent to all aspects of Conservative Dentistry.

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Constitution

The Federation was constituted in Basel, Switzerland, on 20 December 2001.

Membership

There are five classes of membership:

Full Membership

- SIDOC: Società Italiana di Odontoiatria Conservatrice
- CNEOC: Collège National des Enseignants en Odontologie Conservatrice
- AIC: Accademia Italiana di Odontoiatria Conservativa e Restaurativa
- SEOC: Sociedad Española de Odontología Conservadora y Estética
- SSPRE: Schweizerische Gesellschaft für Präventive, Restaurative und Ästhetische Zahnmedizin
- DGZ: Deutsche Gesellschaft für Zahnerhaltung
- ADA: Académie De Dentisterie Adhésive
- RDD: Turkish Society of Restorative Dentistry
- NWVT: Nederlandse Wetenschappelijke Vereniging van Tandartsen

Associate

- Leuvense Universitaire Tadheelkundige Vereniging
- Zahnerhaltung der ÖGZMK, Graz Austria

Corporate

Individual Membership

Honorary Membership

Executive Committee

The Executive Committee consist of:

- President – Prof Dr L Şebnem Türkün
- President-elect – to be elected
- Immediate Past-President - Prof Dr Sebastian Paris
- General Secretary – Dr Shivana Anand
- Treasurer – Dr Julia Amato
- Editor – Prof Dr Laura Ceballos

At least two Councillors elected by the General Assembly from among the representatives of the members- Prof Dr Sophie Doméjean, Prof Dr Niek Opdam, Prof Dr Stephen Dunne, Dr Frode Staxrud, Prof Dr Nicola Scotti and Prof Dr Matthias Hannig.

- All Past-Presidents become consultants to the Executive Committee

General Assembly

The General Assembly is the legislative body of the EFCD. It has powers to:

- enact, amend and repeal the Constitution and By-laws of the EFCD;
- elect and approve appointments to the Executive Committee and other constitutional committees of the EFCD;
- appoint auditors;
- authorise the signing of contracts with other organisations for projects of mutual benefit;

Table 1. Past Officers of the Federation

	President	Treasurer	General Secretary	Webmaster/Editor*
2001-2003	Reinhard Hickel	Marco Oddera	Peter Minnig	
2004-2005	Nairn Wilson	Marco Oddera	Peter Minnig	
2006-2007	Marco Ferrari	Peter Minnig	Peter Minnig	Livio Gallottini
2007-2008	Guido Vanherle	Peter Minnig Jurg Meyer (2008 interim)	Peter Minnig Guido Vanherle (2008 interim)	Guido Vanherle
2009-2010	José C. De la Macorra	Adrian Lussi	Stephen Dunne	Guido Vanherle
2011-2012	Fatma Koray	Adrian Lussi	Stephen Dunne	Guido Vanherle
2013-2014 (Fig. 1)	Pierre Colon	Adrian Lussi	Stephen Dunne	Guido Vanherle
2015-2016	Stephen Dunne	Adrian Lussi	Helena Lewis-Greene	Laura Ceballos García
2017-2018	Lorenzo Breschi	Adrian Lussi	Helena Lewis-Greene	Laura Ceballos García
2019-2020	Sebastian Paris	Adrian Lussi	Helena Lewis-Greene	Laura Ceballos García
2021-2022	L. Şebnem Türkün	Julia Amato	Shivana Anand	Laura Ceballos García

**Initially, the President acted as Editor. The position of Editor was created in 2006.*

- approve the accounts, the administration and management of the financial affairs of the EFCD by the Executive Committee;
- initiate proposals conferring with the objectives of the EFCD;
- decide on the annual dues and approve the budget and
- approve the time and place of future General Assemblies and scientific meetings.

The membership of the General Assembly comprises all Full Members, all Associate and Corporate Members and all Honorary Members who have the right to attend meetings of the General Assembly with the right to vote.

Early history

In 1994 Professor Fons Plasschaert arranged sabbatical leave from Nijmegen University, after having served as Vice-Chancellor, with the glorious title 'Rector Magnificus'. He spent three months in spring of 1994 in Manchester, UK. He stayed with Professor Nairn Wilson, then Dean and Professor of Restorative Dentistry in Manchester, Nairn's wife, Dr Margaret Wilson and their two children. Fons and Nairn worked late most evenings, drinking Dutch Jenever or Scottish whisky, drafting papers and discussing a wide range of dental issues. The foundations for the Academy of Operative Dentistry European Section (AODES) were one of a number of initiatives which stemmed from their discussions. Nairn being involved in the Academy of Operative Dentistry at that time, proposed the formation of the European Section. With perseverance, he finally succeeded. The first AODES meeting was held in Riva del Garda, Italy during April 1998. Nairn was President, his wife Margaret was Secretary and Fons was incoming President. Through the AODES, many close contacts and collaborations were established across Europe.

Remaining frustrated by the absence of an independent European-wide organisation for Conservative Dentistry, in late 1997 Nairn floated the idea of a pan-European body for Conservative Dentistry with several opinion leaders in the field. It was agreed to hold a meeting to explore the proposal. At the suggestion of Professor Reinhard Hickel, arrangements were made to hold the proposed meeting in the Business Centre of Munich Airport, a convenient airline hub. The meeting, generously funded by Reinhard Hickel, was held in the autumn of 1998. Attendees included Professors Reinhard Hickel, Nairn Wilson, Guido Vanherle, Jean-Francois Roulet and Dr Massimo Fuzzi (then President of the Italian Academy of Conservative Dentistry). Dr Fuzzi recalls two additional meetings during 1998/1999, one in Paris and the other in Madrid, again held in airports business centres for convenience.

The outcome of these meetings was that the development of a pan-European body for Conservative Dentistry, offering membership to national organisations for Conservative Dentistry and allied fields – cariology, operative and preventive dentistry, North American style Restorative Dentistry etc, would be a good, but challenging initiative. Before proceeding, it was agreed that a subject wide pan-European scientific meeting should be held during the Millennium Year (2000) to test interest in such an event and provide opportunity to engage more colleagues in further discussions on the proposed pan-European body.

Birth of ConsEuro

The Italian Academy of Conservative Dentistry kindly agreed to host the first pan-European scientific meeting on Conservative Dentistry. Dr Fuzzi was tasked to organise the meeting in his home city – Bologna. One of the first actions in organising the meeting, apart from deciding ▶

on the title "ConsEuro", was recruiting Quintessence to partner the Italian Academy in running the event. The arrangements agreed with Quintessence included an agreement that Nairn Wilson, Jean-Francois Roulet and Massimo Fuzzi would edit a book based on the proceedings of the meeting, with all the royalties going towards offsetting the cost of the venture. The many, different offers of contributions to this book resulted in:
Roulet, J-F., Wilson, N.H.F. & Fuzzi, M. Eds.
Advances in Operative Dentistry. Vol. 1: Contemporary clinical practice.
London, Quintessence Publishing Co. Ltd, 2001.
(Italian edition published in 2003, French edition published in 2003, Chinese and Turkish editions published in 2006, Russian edition in 2007)

Wilson, N.H.F., Roulet, J-F. & Fuzzi, M. Eds.
Advances in Operative Dentistry. Vol 2: Challenges of the Future.
London, Quintessence Publishing Co. Ltd, 2001.
(Italian edition published in 2003, Turkish edition published in 2006)

The ConsEuro, Bologna, meeting was held 11-13 of May 2000. A major theme of this first ConsEuro meeting was 'Teaching of Conservative Dentistry in Europe' (Fig. 1).

Given the good, better than anticipated attendance and positive feedback from the superbly hosted ConsEuro in Bologna, Reinhard Hickel, Nairn Wilson, Pascal Zyman, Massimo Fuzzi, Augustin Pascual, Isobel Camps, Peter Minnig and Fons Plasschaert made arrangements to attend a follow-up in Munich on 2nd November 2000. At this meeting, it was decided to go ahead with the formation of EFCD. Reinhard Hickel and Nairn Wilson agreed to write the first draft of a constitution and by-laws. Following a further meeting in Rome on 5 September 2001, this time attended by Reinhard Hickel, Nairn Wilson,

Fig. 1: Attendees to the first ConsEuro Meeting in Bologna in 2000 (from left to right): Elmar Hellwig (Germany), Reinhard Hickel (Germany), Catorina Wallman (Sweeden), Fons Plasschaert (Netherlands), Roberto Genovesi (Italy); Massimo Fuzzi (Italy); Peter Minnig (Switzerland); Michel Degrange (France) and Nairn Wilson (United Kingdom).

Bart van Meerbeck, Francois Roulet, Massimo Fuzzi, Marco Oddera, Roberto Genovesi, Pier Nicola Mason, Marco Ferrari, Caterina Walloman, Catarin Wretlind, Peter Minnig and Fatma Koray, the EFCD was officially registered in Basel, Switzerland in December 2001.

When formally constituted, the EFCD Executive Committee comprised:
President: Reinhard Hickel
Vice President/ President-Elect: Nairn Wilson
Secretary General: Peter Minnig
Treasurer: Marco Oddera
Councillors: Fons Plasschaert, Guido Goracci, Francois Roulet, Catarina Wretlind, Fatma Koray and Jose de la Macorra
Webmaster: Marco Ferrari

Initial Corporate members included: GABA, Quintessence, Heraeus-Kulzer, Ivoclar Vivadent, 3MEspe, Dentsply and Colgate.

The Executive Committee of the Federation, for example the Executive Committee of 2013 (Fig. 2) shoulders the administration of the Federation on a voluntary basis. To date, the Federation has not employed any administrators, other than conference administrators to assist with the arrangements for ConsEuro meetings.

Fig. 2. Members of the Executive Committee in 2013, from left to right: Guido Vanherle (Belgium); Gottfried Schmalz (Germany); Pierre Colon (France); Stephen Dunne (United Kingdom); Laura Ceballos (Spain); Marianne Federlin (Germany); Şebnem Türkün (Turkey); Helena Lewis-Greene (United Kingdom); Arne Hensten (Norway) and Lorenzo Breschi (Italy).

Following the success of the first ConsEuro in Bologna, it was decided to hold the second ConsEuro scientific meeting in Munich in June 2003, with Reinhard Hickel hosting the event as the first President of the Federation. Again, the meeting was most successful, thanks in large part to enormous effort by the local organising team led by Reinhard Hickel. Thereafter, it became customary for ConsEuro scientific meetings to be held approximately every three years. However, following the success of the Seville meeting in 2009, the decision was taken to hold a ConsEuro meeting every two years, to be hosted by the serving President. The plan was that each President would serve on the Executive Committee for one year as President-Elect, one year as President (and host of ConsEuro) and one year as Immediate Past-President. The venues and dates of the ConsEuro meetings held to date are listed in Table 2.

Tragic Death of the General Secretary

Peter Minnig (included in Fig. 1) served with distinction as General Secretary of the EFCD for seven years. At the General Assembly in 2006, it was agreed that the roles of General Secretary and Treasurer would be merged. Peter accepted the dual position. Tragically, Peter passed away suddenly in 2008. Professor Guido Vanherle kindly stepped in as Interim Secretary, until Professor Stephen Dunne was formally appointed General Secretary in 2009. Peter's sudden passing created a major problem, as nobody, including Peter's wife, knew the password for his computer in which all the EFCD files were stored. This explains the absence of some early EFCD records. Fortunately, Guido Vanherle, who had visited Peter at home in Magden, near Basel, Switzerland, a few months before Peter's death, was able to retrieve from colleagues a lot of the information necessary for his role as Interim Secretary and subsequently President of the Federation. Following Peter's death, Guido Vanherle had to meet with Jurg Meyer, the EFCD Auditor

Fig. 3: Prof Dr Reinhard Hickel responding to the EFCD Award of Excellence during the 9th ConsEuro held in Berlin in 2019. The Award of Excellence sculpture is on the podium to the left of Professor Hickel.

Table 2. Dates and venues of the ConsEuro meetings

1st ConsEuro	2nd ConsEuro	3rd ConsEuro	4th ConsEuro	5th ConsEuro	6th ConsEuro	7th ConsEuro	8th ConsEuro	9th ConsEuro	10th ConsEuro
Bologna 2000	Munich 2003	Rome 2006	Seville 2009	Istanbul 2011	Paris 2013	London 2015	Bologna 2017	Berlin 2019	Online 2021

in Basel, Switzerland, to make arrangements to access the EFCD bank account, to which Peter had previously exclusive access. At the next General Assembly, Jurg was appointed Interim Treasurer to work with Guido Vanherle, who continued as Interim Secretary until Stepehen Dunne was appointed General Secretary in 2009.

Award of Excellence

The Award of Excellence is the highest award of the Federation. The Award is made in recognition of outstanding contributions to Conservative Dentistry over a period, normally in excess of 30 years, in one or more of the fields of clinical practice, education, research, contributions to society, leadership and the promotion of professional standards. Presentation of the Award of Excellence is made biannually by the President of the Federation at the ConsEuro meeting. The Award takes the form of a certificate and a specially designed sculpture inscribed with the awardee's name and the year of the Award. The Award is not accompanied by a monetary prize.

Nairn Wilson, who served as second President of the Federation in 2004-2005 and has continued to assist the EFCD from time to time; for example, with the introduction of Individual Membership in 2020, was responsible for introduction of the EFCD Award of Excellence. The founding recipient of the Award in 2005 was Ivar Mjør. Recipients of the EFCD Award of Excellence are listed in Table 3.

Scientific Foundation

The creation of a Scientific Foundation was a goal from the outset of the Federation but one that could not be financed during the fledging years of the organisation. The provisions and arrangements for Scientific Foundation Awards were drafted at the same time as the arrangements and provisions for the Award of Excellence. It was decided to proceed with the Award of Excellence ahead of launching Scientific Foundation Awards, pending the financial strength of the EFCD becoming more secure. The Award of Excellence and the Scientific Foundation Awards were considered good ways to raise the profile of the Federation.

The purpose of Scientific Foundation Awards is to finance scientific visits (3-12 months) to European dental schools to undertake research in Conservative Dentistry. Recipients of Scientific Foundation Awards are listed in Table 4.

Poster prizes

Prizes for best posters were introduced at the second ConsEuro in Munich to encourage the submission of abstracts and, in turn, attendance by young colleagues. Prizes were awarded in several categories, including, Prevention, Materials Science, Clinical Cases etc. In addition to a prize certificate, each prize includes a monetary award, with a value depending on the financial strength of the Federation at that time.

Clinical Oral Investigations/ Springer

Cooperation between Clinical Oral Investigations (CLOI) and EFCD started in 2003, at the time that Reinhard Hickel organised the second ConsEuro meeting in Munich. The abstracts of that meeting were published in CLOI. Before the ConsEuro meeting 2009 in Seville, Jose de la Macorra, then President of EFCD, and Gottfried Schmalz (Editor-in-Chief of CLOI) negotiated with Springer in Heidelberg a formal cooperation between EFCD and CLOI. The proposed arrangements were taken to the Board of EFCD, which held further discussions with Gottfried Schmalz. In the meantime, the abstracts from the ConsEuro 2009 were published in CLOI (see below).

At the meeting of the EFCD Board held at the time of the

Table 3. Recipients of the EFCD Award of Excellence.

2005	Ivar Andreas Mjør
2006	Carel Davidson
2007	Edwina Kidd
2008	Erik Admussen
2009	Ole Blok Fejerskov
2010	Jacob Martien ten Cate
2011	Gottfried Schmalz
2012	Gunnar Bergenholtz
2013	Jens Ove Andreasen
2014	Guido Vanherle
2015	Thomas Imfeld
2016	Jean-François Roulet
2017	Pierre Colon
2018	Reinhard Hickel (Fig. 3)
2019	Stephen Dunne

Table 4. Recipients of EFCD Scientific Foundation Awards.

Mine Dündar.	February-July 2009
Anne-Katrin Luehrs	February-August 2013
Barbara Cvikl	February-August 2013
Eugenia Baena Aguilera	February-June 2015
Carmen Arpa Sacristán	October 2015-July 2016
Sophia Lindner	August 2017-March 2018
Tatjana Maravic	November 2018 - November 2019

ConsEuro meeting in Paris in 2013, attended by a representative of Springer (S. Klemp) and Gottfried Schmalz, a contract for an affiliation between Springer and EFCD was discussed. This contract was signed on behalf of EFCD by Pierre Colon, then President and Adrain Lussi (Treasurer) on July 1st, 2014.

In the contract, CLOI was recognised as the "official journal of EFCD", with members of the Federation being offered a reduced subscription rate for the journal. Abstracts from ConsEuro meetings would be published in CLOI, both electronically and in print at no cost to the Federation, except for an open access fee of 2200 €.

Gottfried Schmalz, recipient of the Federation's Award of Excellence in 2011, acted as consultant and liaison between CLOI and the EFCD Board between 2012 and 2021, when he resigned as Editor-in-Chief of CLOI to be succeeded by Matthias Hannig.

The contract between EFCD and Springer was amended in August 2020, CLOI having adopted electronic publication. In the revised contract Springer is committed to publishing the abstracts of ConsEuro meetings, together with an outline of the programme for each meeting, and other material as agreed by EFCD and the Editor-in-Chief. The first 60 pages of each set of abstracts (typeset in journal design) is published at no cost to the Federation. Additional pages arecharged at 75 € per page. The abstracts are published in electronic format and made available to all paid subscribers. Additionally, the abstracts are available on open access at no cost to EFCD.

The abstracts of ConsEuro 2003 and all ConsEuro meetings since 2009, all fully citable and included in PubMed, may be found in CLOI as follows:

- ConsEuro 2003: Clinical Oral Investigations 2004; 8: S1–S25
- ConsEuro 2009: Clinical Oral Investigations 2009;13:49-118
- ConsEuro 2011: Clinical Oral Investigations 2011;15:771
- ConsEuro 2013: Clinical Oral Investigations 2013;17:1029–1111
- ConsEuro 2015: Clinical Oral Investigations 2015;19:1701–1754
- ConsEuro 2017: Clinical Oral Investigations 2017;21:1359–1433
- ConsEuro 2019: Clinical Oral Investigations 2019;23: 2515–2572
- ConsEuro 2021: Clinical Oral Investigations 2021;25: 4185–4238

In addition, the following EFCD consensus reports have been published in CLOI and Caries Research:

- Carvalho TS, Colon P, Ganss C, Huysmans MC, Lussi A, Schlueter N, Schmalz G, Shellis RP, Tveit AB, Wiegand A. Consensus report of the EFCD: erosive tooth wear-diagnosis and management. Clinical Oral Investigations 2015;19:1557-1561.
- Meyer-Lueckel H, Opdam NJM, Breschi L, Buchalla W, Ceballos L, Doméjean S, Federlin M, Field J, Gurgan S, Hayashi M, Laegreid T, Loomans BAC, Lussi A, Lynch CD, Pallesen U, Peumans M, Toth Z, Wilson NHF. EFCD Curriculum for undergraduate students in Integrated Conservative Oral Healthcare (ConsCare). Clinical Oral Investigations 2019;23:3661-3670.
- Splieth CH, Banerjee A, Bottenberg P, Breschi L, Campus G, Ekstrand KR, Giacaman RA, Haak R, Hannig M, Hickel R, Juric H, Lussi A, Machiulskiene V, Manton DJ, Jablonski-Momeni A, Opdam NJM, Paris S, Santamaría RM, Schwendicke F, Tassery H, Ferreira Zandona A, Zero DT, Zimmer S, Doméjean S. How to intervene in the caries process in children: A joint ORCA and EFCD Expert Delphi Consensus Statement. Caries Research 2020;54:297-305.
- Schwendicke F, Splieth CH, Bottenberg P, Breschi L, Campus G, Doméjean S, Ekstrand K, Giacaman RA, Haak R, Hannig M, Hickel R, Juric H, Lussi A, Machiulskiene V, Manton D, Jablonski-Momeni A, Opdam N, Paris S, Santamaria R, Tassery H, Zandona A, Zero D, Zimmer S, Banerjee A. How to intervene in the caries process in adults: proximal and secondary caries? An EFCD-ORCA-DGZ Expert Delphi Consensus Statement. Clinical Oral Investigations 2020;24:3315-3321.
- Paris S, Banerjee A, Bottenberg P, Breschi L, Campus G, Doméjean S, Ekstrand K, Giacaman RA, Haak R, Hannig M, Hickel R, Juric H, Lussi A, Machiulskiene V, Manton D, Jablonski-Momeni A, Santamaria R, Schwendicke F, Splieth CH, Tassery H, Zandona A, Zero D, Zimmer S, Opdam N. How to intervene in the caries process in older adults: A joint ORCA and EFCD Expert Delphi Consensus Statement. Caries Research 2020; 54: 459-465.

Current activities

With the present difficulties caused by the COVID-19 pandemic, the activities of the Federation are limited to planning future events and new initiatives to promote conservative and minimal intervention dentistry, specifically for general dental practitioners and dental school teachers. To strengthen links with ORCA, the scientific organisation for cariology, EFCD will working in conjunction with ORCA to hold ORCA's 2023 meeting in Amsterdam, with the purpose of bringing modern cariology and restorative dentistry closer together in the interests of researchers, teachers and general dentists.

EFCD Working Groups

To raise the profile of EFCD and ConsEuro meetings and to allow more individuals to engage with EFCD, two working groups have been formed to support and expand the work of the EFCD:

- The Scientific Working Group has been formed to encourage and support activities pertinent to conservative oral health care, including systematic reviews, consensus meetings, Delphi procedures, the development of guidelines etc.
- The Strategic Working Group will define the strategic orientation and development of EFCD. As part of its work this group will develop strategies to build the membership of the Federation, both national societies in the field ▶

of restorative dentistry as well as individual members. Moreover, strategies will be developed to increase the visibility and appeal of EFCD as an important Federation across Europe and beyond.

COVID-19 pandemic

The tenth ConsEuro meeting was originally planned to be held in Antalya, Turkey between 22nd and 24th of April 2021. The theme of the congress was "Dentistry 2.0-New technologies and materials in today's dentistry". Up until the end of 2020, it was hoped that the conference would take its usual form with delegates being physically present, with lots of face-to-face interatctions. However, with the emergence of the COVID-19 pandemic and many European countries going into some form of lockdown with travel restrictions, the Executive Committee decided to postpone the 'physical' ConsEuro Conference until 21st to the 23rd April 2022 and to make arrangements to have a 'virtual' ConsEuro 2021 congress. For this exceptional meeting, EFCD and RDD (the Turkish Restorative Dentistry Society) invited 12 eminent opinion leaders from across Europe to present their latest research in Conservative Dentistry, with a focus on new technologies and materials, and their applications. The 'virtual' conference was a great success. The lectures were pre-recorded and at the end of each day, a live discussion was held with the speakers of the day. Moreover, it was possible to accept posters for virtual presentation not only from across Europe but from all over the world. A good number of industry sponsors were happy to create virtual stands to be visited by the participants and have live discussions with them between and following lectures.

The 'virtual' ConsEuro experience was very positively received by our members and attracted an encouraging number of participants from around the world. Moreover, the lectures could be re-watched at any time by registered participants up to 21 days after the event.

The future

Compared to other dental disciplines, European dentists and researchers with a special interest in Conservative Dentistry tend to continue to be involved with local or national organisations rather than engaging with the relevant pan-European body – the EFCD. The Federation plans to raise its visibility, importance and accessibility to all those, specifically those in continental Europe who would benefit from adopting a 'supranational' view to engagement in the advancement of the art and science of Conservative Dentistry. With trends in oral and dental diseases and advances in relevant technologies occurring at a continental, if not global level, it is critical to the future of Conservative Dentistry, as it is for other dental, let alone medical disciplines to have a 'supranational' organisation, such as a federation to complement and enhance the important activities of local and national bodies. Moreover, for individuals in countries which lack local and national organisations pertinent to their area of special interest and expertise, it is important that they have opportunity to become individual members of the relevant 'supranational' organisation, thereby avoiding isolation and academic stagnation.

To achieve its aims the EFCD will intensify its cooperation with existing national society members and improve communications with national societies and individuals not presently included in the membership of the Federation. Through the provision of reviews, guidelines, consensus statements etc, together with opportunities to meet virtually or physically and initiatives such as the formation of an academic forum for university teachers of Conservative Dentistry, the EFCD intends to reach out to its potentially very large future membership. Also, through collaborative ventures with other European and global federations and associations, such as ORCA, the EFP (European Federation of Periodontology), ESE (European Society for Edodontology) and EPA (European Prosthodontic Association), the EFCD intends to help promote the holistic, integrated care of patients and much-needed interdisciplinary research to investigate areas of mutual and overlapping interests.

Conclusion

In common with many dental organisations, the EFCD, in the aftermath of the COVID-19 pandemic will need to address a number of critical issues in 2022. We anticipate difficulties in attracting new members, sponsors and attendees to 'physical' ConsEuro meetings, even when the recovery from the pandemic is well advanced. However, the EFCD pertains to the most widely practised aspect of dentistry -conservative oral health care and, as such, has a critical role to play in shaping the future of dentistry. To thrive, as it must, the EFCD will develop new relationships with practitioners, scientists and dental school teachers, collaborations with national societies, and attract individual members in countries with no relevant national society. In these, and other ways ways, the EFCD will gain more visibility and impact and thereby help to ensure that conservative oral health care is recognised to be central to modern oral health care provision.

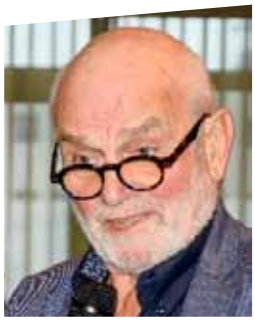
Acknowledgement

The authors acknowledge the invaluable contributions of Professors Nairn Wilson, Fons Plasschaert, Reinhard Hickel, Guido Vanherle and Lorenzo Breschi, and Dr Massimo Fuzzi, in the writing of the early history of the EFCD. The authors also acknowledge the most helpful contributions of all members of the EFCD Executive Committee in the writing of this paper. ■

Fibrodysplasia ossificans progressiva 2021

Five years have passed since our publication in 2017 on fibrodysplasia ossificans progressiva (FOP) in the ICDigest. What have been the important developments in FOP research and what has most concerned the FOP community?

Elinor Bouvy-Berends - FICD
Chair, Dutch FOP Foundation



Coen Netelenbos
Emeritus Professor of Endocrinology

Although the number of clinical trials has increased significantly, there are still no drugs that reduce or prevent heterotopic bone formation. FOP patients have experienced limitations and difficulties since the outbreak of the COVID pandemic: it took a long time before they dared to be vaccinated because of the risk of flare-ups after the intramuscular injection. In general, COVID-19 has negatively impacted the quality of life of FOP patients. It has been shown that 70% of FOP patients experience at some point a (very) limited maximum mouth opening (MMO) due to heterotopic ossification (HO) of the temporomandibular joint (TMJ) and surrounding structures of the maxillofacial region. The decrease in MMO has far reaching consequences for the quality of life of FOP patients.

Research, onset and limitations

Since the discovery of the relevant genetic mutation in 2006 by Dr Eileen Shore et al., the genetic cause of the disease is well known, but the natural course of the disease remains to be fully understood, and therapeutic options are still not available.
The first sign of FOP is congenital malformation of the big toes (bilateral hallux valgus). Unfortunately, this important, early sign of FOP is still often missed, leading to delayed diagnosis and detrimental mismanagement of the patient.

Unbearable bone revisited

An article on fibrodysplasia ossificans progressiva (FOP)* was published in ICDigest 2017 (van Driel W et al. ICDigest,2017;61:20-25) based on an interview with Fellow Elinor Bouvy-Berends, President of the Dutch FOP Foundation and her research colleagues at the Academic Center Dentistry Amsterdam (ACTA) and the VUmc Amsterdam.
The article, entitled Unbearable Bone, explained the origin of the rare condition of FOP, patients' physical and psychological burdens, early signs and symptoms and problems of late (dental) diagnosis. It provided an overview of the research to understand the genetic mutation leading to heterotopic bone formation.

The Dutch FOP Foundation holds an annual study day to present research findings and update patients and families. Having attended the 2021 annual meeting, listened to the research reports and appreciated how much progress was made in the last five years, I was motivated to invite Elinor Bouvy to update our knowledge of this disease. Elinor and her colleague, Emeritus Professor Dr Coen Netelenbos have provided thies summary of recent research findings, with a focus on the dental and maxillofacial implications of FOP, and to promote further awareness of the implications and risks of both treatment and non-treatment.

Frans Kroon MICD – European Section

The main characteristic of FOP disease activity is a flare-up, followed by the formation of HO. Flare-ups may develop, or be triggered by an infection or local trauma that damages muscles, tendons and ligamentous structures.
Research on FOP is limited mainly by the lack of specimens, as invasive procedures (biopsies, surgeries and even phlebotomy) may worsen the disease. Another problem for researchers, specifically those in pharmaceutical companies, is the rarity of the disease -900 known patients globally. To test any therapeutic agent, patients with FOP must participate in Phase II and Phase III trials in sufficient numbers to obtain significant findings.
Five years ago, only two pharmaceutical companies (Regeneron Pharmaceuticals Inc. and Clementia Pharmaceuticals now IPSEN) conducted clinical trials in FOP. As of 2019, a significant increase in FOP research has occurred: six clinical trials, four preclinical trials, six laboratory studies, but no drug has yet been approved.

Research at the international FOP Expert Centre

In 2015, Dr Marelise Eekhoff, internist-endocrinologist, began seeing patients with FOP who had previously been treated by her predecessor Professor Coen Netelenbos. Dr Eekhoff established a centre of expertise in FOP at Amsterdam UMC. This centre has since developed into the International FOP Expert Centre where a large team of specialised doctors and researchers, drawn from many, different disciplines, carries out multiple international trials under Dr Eekhoff's inspiring leadership.
The STOPFOP trial is currently underway. This trial, supported by a grant from the European Commission Innovative Medicine Initiative, was initiated on the initiative of academic researchers (investigator-initiated). The aim of STOPFOP is to see if the experimental drug AZD0530, also known as Saracatinib, may be repurposed to treat FOP. Research by the STOPFOP team has shown that AZD0530 blocks the activity of the mutated acvr1 receptor, also known as ALK2 (https://www.stopfop.com/).

A Regeneron's Lumina-1 Phase 2 trial, using activin-A antibodies, performed also in Amsterdam, among other centres, had to be discontinued for safety reasons, as was the MOVE trial of Clementia (now IPSEN) that was running in other centres across the world. The safety of these studies will be further investigated and the effectiveness reassessed.

In her thesis (2021) entitled "Unravelling heterotopic ossification in FOP" Dr Esmée Botman investigated which measurable marker (biomarker) provides valid information about disease biological activity in FOP. The findings of her research, in the diagnosis of patients with FOP, using the 18F-NaF PET/CT imaging technique, revealed that irrespective of whether the patient has a flare-up or not, PET/CT scans frequently produce images indicating elevated activity of bone formation. When this is seen during the first phase of a clinical flare-up, it can be assumed that HO will take place. This currently makes PET/CT scans the best biomarker to visualize and quantify bone forming activity of FOP. Even in clinical inactive phases of the disease, elevated and increasing activity is seen in most patients.
Research in Dr Ton Schoenmaker's ACTA-Lab focuses on the effect of Activin-A on osteoblasts (differentiated from the periodontal ligament fibroblasts, derived from extracted molars of FOP patients) and osteoclasts. This effect has been examined both at cell and molecular biological levels, including RNA sequencing experiments. These experiments attempt to map the effect of Activin-A in a broader context -important if one tries to counter the progression of FOP with antibodies against Activin-A.

Mandibular function in FOP

The average maximum mouth opening (MMO) in the normal population is 45 mm for females and 50 mm for males.
Mouth opening in FOP patients can gradually decrease to zero, with serious consequences for eating, oral hygiene and dental treatment. FOP patients with severely restricted mouth opening report their fear of vomiting. Severe

*Fibrodysplasia ossificans progressiva

Fibrodysplasia ossificans progressiva (FOP) is a rare, disabling genetic condition characterized by congenital malformations of the great toes and progressive heterotopic ossification (HO) of connective tissues in specific anatomic patterns. FOP is the most catastrophic disorder of HO in humans. Prevalence is estimated at 1 in 1.5 million. Flare-ups are episodic; immobility is cumulative. A common mutation (R206H) in activin receptor IA (ACVR1), a bone morphogenetic protein (BMP) type I receptor, exists in all sporadic and familial cases with a classic presentation of FOP. Approximately 97% of individuals with FOP have this recurrent mutation.
The mutation changes the receptors sensitivity. One of the consequences is that, in contrast to the situation in Non-FOP persons, Activin-A in FOP stimulates the heterotopic ossification process. Approximately 3% of affected individuals have a variant mutation in ACVR1, but all individuals with FOP have mutations in the ACVR1 gene.
Kaplan FS, et al. The medical management of fibrodysplasia ossificans progressiva: current treatment considerations. https://www.iccfop.org/dvlp/wp-content/uploads/2021/08/guidelines-aug-2021.pdf

Fig. 1: CT-3D sagital scan of a FOP patient with minimal mouth opening, showing the right lateral side: extensive heterotopic ossification of the sternocleidomastoid muscle (from sternum to mastoid), connected with the mandibular angle area. Reproduced from Adán CIO et al. Int J Clin Maxfac Surg, 2018;4:4-10.

weight loss may result following ankylosis of the TMJ. Heterotopic ossification is often preceded by flare-ups, an inflammatory process, characterized by swelling and pain. Flare-up episodes eventually lead to ankylosis of all major skeletal joints (shoulders, hips, elbows, knees) including the temporomandibular joint (TMJ). In about 70% of FOP patients, a limitation of jaw movements and mouth opening due to HO in the TMJ (Fig. 1) and the maxillofacial area is seen on average at 19 years of age. An almost inescapable condition, with far-reaching consequences for the quality of live.

Given the above, Ton Schoenmaker and Teun de Vries, both working at the ACTA Department of Experimental Periodontology, initiated a literature review on the causes and locations of heterotopic ossification in the maxillofacial region and the TMJ. The results of this review will be published shortly, including proposed recommendations for the oral care of patients with FOP.

Dental treatment

The risks of attempting to exceed MMO in FOP patients, which can trigger the onset of HO, are well described. Lengthy dental treatment sessions should therefore be avoided.

With greatly reduced jaw movements, less saliva is produced. The risks of reduced salivary flow to oral health are known and should be explicitly discussed in dental guidance to patients with FOP.

In many FOP patients, the origin of restricted mouth opening can be traced back to mandibular block anaesthesia, as the procedure may lead to ossification of the pterygoid muscles and ankylosis of the TMJ. Mandibular block anaesthesia should therefore be avoided wherever possible in FOP patients. Alternative approaches to obtaining anaesthesia, including infiltration, intraligamentary and intraosseous techniques should be adopted.

While orthodontic movements of teeth is possible in FOP patients, because their periodontal ligaments reacts normally to orthodontic forces, more research on displacement forces and alternative orthodontic techniques, such as Invisalign®, is needed to rule out the risk of HO.

When mouth opening is severely restricted in FOP patients, it may be necessary to remove one or more teeth to create space for food passage. By retaining molar support, it should prove possible to avoid loss of occlusal vertical height and retain the stability of the occlusion.

Conclusion

Although dentists will rarely encounter FOP, it is important that they are familiar with it and understand the consequences of inappropriate operative intervention.

Further information and guidance is available on the International Clinical Council for FOP website: https://www.iccfop.org/ + www.ifopa.org + www.fopstichting.nl ■

ICD International Council 2021

Argirios Pissiotis - FICD

Governance

The International College of Dentists is governed by the International Council and its Executive Committee. As a governing body the International Council is made up of Councilors, College Officers, and a Secretary General. The term of Officers is one year except for the Treasurer whose term is four years. The Editor is appointed by the International Council annually. Also annually, a Vice-President is nominated by the International Council's Nominating Committee and elected by the Council. This position is protected in that the individual automatically succeeds to President-Elect and President in the next two years. The Secretary General has a contract with the Executive Committee and Council, which specifies the duration. The Speaker of the Council is an Officer of the International Council only and is elected by the International Council or the Executive Committee on an annual-need basis.

Bylaws and Standing Rules

The International Council is guided by the College's Bylaws and Standing Rules. Councilors are equals among peers. The International Council meets once in person each year during the months of September, October or November. The official correspondences and the business of the Council is conducted in English. Various Sections may invite and host the International Council at the same time as their annual convocation ceremony for new Fellows.

Councilors are chosen by their respective Sections. They are expected to attend the annual meeting of the Council. If for some reason they may not attend, they are to request a leave of absence from the Secretary General. They may assign an official alternative Councilor in their place. The Councilor is expected to participate in all Council deliberations and work on assigned committees during the annual meeting and throughout the year as necessary. Councilors are required to prepare a written report of their Section's events and activities.

Presently the International Council (IC) consists of 32 people including the Officers, the Secretary General, the Editor, and the Speaker of the Council. All Sections have at least one representative Councilor. A minimum of five hundred (500) Active Fellows in good standing is required to appoint and maintain a second Councilor. Additional Councilors may be appointed for every five hundred (500) additional Fellows in good standing in a Section.

Information Session

The IC met virtually on two occasions during 2021. The first meeting, an 'Information Session' was held on August 28. The purpose of this meeting was to discuss reports of Officers, Committees and Sections, consider College program reports (Global Visionary Fund and ICD-WUDAA Scholarship Program) and discuss and prepare motions to be brought forward for voting during the International Council Meeting planned for September. Amongst other items, the IC approved the Section XX Standing Rules, the College Policy Manual, proposed changes to the College Standing Rules, College Flag and logo and added a discussion on strategic planning to the order of business of the IC. Additionally, the IC approved the definition of the Inactive Status of a Fellow, arrangements for the management of the database, changes to the Membership Standing Rules and proposed changes to the Award Committee. Finally, the IC adopted the 2022 College Budget.

Formal meeting

The second meeting of the IC - the formal meeting, was held on September 11. During this meeting the IC adopted a motion to temporarily suspend the order of business described in the Standing Rules and have a limited agenda only, given the extraordinary circumstances. During the meeting the IC voted on and approved all the motions discussed and prepared during the Information Session. Amongst new business, the IC approved to defer the Section XIV 2022 capitation fees to 2023 because of local restrictions on international money transfers in Myanmar under the current military government. Also, the IC recognized each one of the College's Awardees, including the posthumous Master Fellow Award to the late Bettie McKaig of Section I (USA). Finally following nomination by the Nominating Committee, the following were declared the elected 2021-2022 International Officers: Richard Smith, International President, Ho Youl Chang, International President-Elect, Argirios Pissiotis, International Vice President, Keith Suchy, International Treasurer, and Dov Sydney, International Editor. For the European Section this means that the proposal of the Section two years ago was adopted by the IC, with the result that in 2023 another European Fellow, Argirios Pissiotis will become President of the College. ■

Editorial note

Many congratulations to Argirios Pissiotis, Past-President, Deputy Registrar, and International Councilor of the European Section on being elected International Vice-President of the College. The Section applauds Argirios on this richly deserved accolade and wishes him every success in his new and subsequent role as International President-Elect, leading to the prestigious position of International President of the College in 2023. The Section is most proud of Argirios and looks forward to supporting him in his leadership of the College.

Letter from the President

Gil Alves Alcoforado – FICD
President of the European Section

Dear Fellows and Inductees,

It will be a real pleasure to welcome you to this year's ICD Annual Meeting in Oporto, to be held between Thursday 9th June and Sunday 11th June 2022. We have prepared an exciting scientific and social programme for you and your accompanying person.

Oporto is a delightful city with tremendous charm and tradition. You will have the possibility of enjoying our internationally renowned local cuisine and several tastings of the famous port wine, as well as some extraordinary white and red wines produced in the Douro Valley. For those who will stay on for the Sunday after-meeting tour, we have planned a boat tour on the Douro River, travelling to a famous port wine grape vineyard to enjoy a al fresco lunch, following a tour of the working vineyard.
The main hotel, Palácio do Freixo, is a beautiful palace on the shores of the Douro River. Several of our meetings and get togethers will be held there. There is a selection of other, conveniently located hotels to choose from.

On Thursday 9th June there will be a reception to welcome everybody to the event and have the first taste of the warmth of the beautiful city of Oporto. Cocktails will be served in the garden of the Palácio do Freixo hotel with a magnificent view of the Douro River.

On Friday 10th June, Fellows will attend the Scientific Programme, including the important Humanitarian Forum. Accompanying persons will have opportunity to sightsee some hidden treasures of the city of Oporto. In the evening, a dinner will be held in one of the most famous Port Winery Cellars. There will be plenty of opportunities to taste different types of port wines and try out some of the local gastronomy.

Saturday 11th June is the 'Big Day', especially for the inductees. The morning is free time. The Section's 2022 Induction Ceremony will take place in the Arab Room of the old Stock Exchange Palace in the center of Oporto. This palace, dating back to 1842, is a very special place. It is known for its beautiful nineteenth century neoclassical architecture. It was once one of Portugal's most important commerce trading centers. Afterwards, there will be a cocktail reception to celebrate the induction of the new Fellows. The Section's 2022 black tie Gala Dinner will be held immediately after the cocktail party in the Nations' Hall of the Palace.

On Sunday, an after meeting trip will be organized with a trip on a traditional boat on the Douro River, followed by a visit and a lunch at the Quinta Nova winery.

I hope we can finally meet up in person and enjoy this year's Annual Meeting together. I sincerely hope to see you all there.

Warmest regards,

New Fellows 2021

As explained in 'News from the Districts', circumstances and restrictions in 2021 caused by the COVID-19 pandemic, made it necessary for the Districts of the Section to conduct induction ceremonies, some of which had to be virtual. The Regents of the Section are to be congratulated and thanked for taking on this additional responsibility and for having gone to great lengths to make the 2021 inductions to Fellowship of the College as special as possible.

Arrangements will be made for all 2021 inductees attending the Section's Annual Meeting in Porto in June 2022 to be recognised and formally welcomed into the Fellowship of the College during what is hoped to be a restriction free, traditional induction ceremony.

In the meantime, the Section welcomes the following new Fellows, who kindly provided their portrait photographs.

1

Manfred Gloessel

Michael Payer

Georg Mallath-Pokorney

2

Paulien de Boer

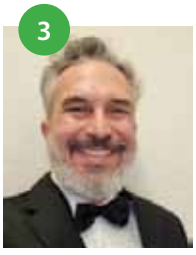
Johan Cossé

Frithjof Kroon

Tim Meijer

Hans Prakken

3



Antonios Zampelis

Mortan í Hamrabyrgi

Eirik Torjuul Halvorsen

4

Jon Ayres

Avijit Banerjee

Snehal Dattani

Elizabeth Devenish

Yasmin George

Harkirat Hunjan

Helen Jones

Ian Mills

Sarab Oberai

Amit Patel

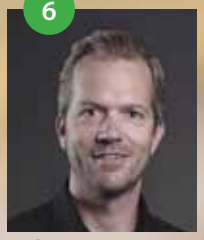
Phillip Pettermerides

Evelyn Sheehy

Lena Vakhil


Sunita Verma


Katharine Winstone


6
Jochen West


7
Leonidas Batas


Petros Kokkinos


8
Nuala Carney


Peter Crooks


Robin Foyle


Ryan Hennessey


Kieran O'Connor


Jane Renehan


9
Vladi Dvoyris


Hagay Slutsky


10
Tommaso Clauser


Carlo Francesco


Francesco Giachi


Francesco GiachiCaru


Rodolfo Gianserra


Matteo Piero


Gabriele Rosano


Elena Rosina


Riccardo Scaini


Stefano Sipos


Nicolo Vercellini


11
Goncalo Assis


Miguel Meira e Cruz


12
Ana Molina


Angel Carrero


Juan Jose Guarro


Juan Manuel Liñares


Paloma Villalba


Pere Riutord


Sebastiana Arroyo


13
Sabrina Maniewicz


Alkisti Zekeridou


Dena Talal Hashim


15
Mieszko Wieckiewicz

District 1 Austria
District 2 Benelux
District 3 Scandinavia
District 4 England, Scotland and Wales
District 6 Germany
District 7 Greece and Cyprus
District 8 Ireland
District 9 Israel and Malta
District 10 Italy
District 11 Portugal
District 12 Spain
District 13 Switzerland
District 15 Central and Northern Europe

Meet the new Editor-in-Chief:
Michael Thomas FICD

Interviewed by Nairn Wilson FICD

Michael, what are your present positions and responsibilities?

I am, primarily, a "wet-fingered" practising dentist. I work, as an associate within a dental practice as a specialist in prosthodontics, providing care to patients who have been referred by their general dental practitioners. The practice is owned by a dental corporate, BUPA Dental Care. It was established 18 years ago as a referral centre in a primary care setting. The practice has 11 surgeries and offers specialist care in all aspects of dentistry. There are daily challenges in planning and carrying out treatment for complex cases, but I am very fortunate to be able to work with a great group of like-minded colleagues. Working as part of a team of health care professionals offers me fantastic opportunities to discuss cases, benefit from peer review and reflect on a daily basis.

I consider myself to be especially fortunate in that my working week is varied. I am a Senior Teaching Fellow and Senior Specialist Clinical Teacher at the Faculty of Dentistry, Oral & Craniofacial Sciences, King's College London. I have been teaching undergraduate dental-, and more recently dental therapy students in the Department of Conservative and MI Dentistry, for over 20 years. Also, I teach and assess on three of the Faculty's highly acclaimed distance, blended learning programmes. I am the Deputy Programme Manager for the Advanced Minimum Intervention Dentistry MSc by Distance Learning. Working under the direction, supervision, support and encouragement of Professor Avijit Banerjee, teaching in this subject area has provided me with opportunities to re-evaluate how I plan and deliver care in my practice setting. Also, it has helped me evolve treatments to the benefit of my patients. It is a sad day when I do not learn something new, and it is a privilege to be involved in teaching new generations of undergraduate and postgraduate students. I firmly believe that it is important to be able to "walk the walk" before "talking the talk", and hence the importance of my teaching being based on personal experiences, as well as sound academic principles of providing personalised care for patients.

I also teach beyond the university setting and have presented in North America, across Europe, India, Africa and Australia. Dentistry has provided me with many opportunities to meet with colleagues across the world. One of the favourite events in my diary is an annual visit to the Chicago Midwinter Dental Meeting, which I have attended 26 times over the years! This is always an enjoyable event and a great opportunity to meet old and new friends, and to reflect on different aspects of dental care.

Also, I am involved in preparing medico-legal reports for various purposes. In the past I have served on a number of local and national dental committees and boards, and now have a new opportunity as Editor-in-Chief of ICDigest.

What does being a Fellow of ICD mean to you?

I was surprised when I was invited to become a Fellow of ICD and had little knowledge of ICD prior to this. It is an honour to be nominated by one's peers and hence

I was pleased to accept the nomination. Being a Fellow of ICD has opened new possibilities of meeting new friends and colleagues in a different setting to more academic organisations. What has struck me from the beginning is the friendliness of all the Fellows whom I have had the pleasure of meeting in Geneva and Thessaloniki, as well as the UK. Dentists consist of a vast array of experiences and skills in so many different aspects of life. Being a Fellow of ICD has helped me to reset my thinking as a dentist, putting my dental work into perspective as part of a much bigger contribution to society in which social meetings and humanitarian activities have a high profile and importance. Being a Fellow provides new opportunities to serve, inspired and encouraged by those who have served.

What do you see to be the importance of ICDigest?

ICDigest, as the journal of the European Section of ICD, has traditionally sought to inform Fellows of the past, current and future activities of the Section, together with insights into different aspects of the art and science of dentistry. However, as digital communications have become commonplace, the role of the traditional journal is changing. With a single issue annually, ICDigest should contribute to meeting the objectives of ICD by providing a universal forum for the cultivation of cordial relations within the profession, fostering the growth and diffusion of dental knowledge and recognising distinguished service to the profession and public in Europe and beyond. Also, ICDigest should promote postgraduate study and research in the field of oral health, contribute to the advancement of the profession of dentistry internationally, and encourage and support humanitarian activities. Furthermore, ICDigest should help uphold the highest standards of professional competence and personal ethics. Previous editions of ICDigest, available from the Section website, provide a fascinating insight to the activities of the Section over the past 18 years. It is important that ICDigest builds on past success and looks to the future so that all Fellows look forward to its arrival in their mailbox. It is a means of linking colleagues together in fellowship, reflecting on past events and in anticipation of forthcoming and future meetings.

What are your plans for ICDigest over the next five or more years?

My plans are at a very early stage, but are certainly based on evolution rather than revolution. I will be "standing on the shoulders of giants" in following Nairn Wilson and his predecessors as Editor-in-Chief. My aim will be to make the ICDigest a much-anticipated publication that involves all of the Districts. I hope that I will have a choice articles to publish, rather than commission contributions, and that ICDigest will provide a diverse range of content that attracts a wide range of interest and readership.

What can Fellows do to assist you in going forward?

Suggestions and comments will always be welcome! The success of ICDigest will only be as good as the contributions it receives. I will be pleased to receive articles from new as well as established contributors. I will also seek to review the editorial board and invite Fellows with an interest in further developing ICDigest to get in touch. There is a great deal of talent and original thought within the Section; I will seek to tap this fount of skill and knowledge! ■

Future Annual Meetings of the European Section International College of Dentists

2022 Porto, Portugal 9-11 June 2022

2023 Amsterdam, The Netherlands 21-25 June 2023

2024 Jerusalem, Israel 17-20 June 2024

See www.icd-europe.com for further information on the Annual Meetings of the Section.