AOSC 2019 increase attendance by 20% with more than 900 professionals

By DTI

Study indicates potential of berry extract to fight off dental bacteria

By DTI

Brisbane, Australia: A recent study has suggested that concentrated extracts of polyphenol-rich fruits such as cranberries and blueberries could prove beneficial for combating certain bacteria in dental biofilm. The findings of the research, conducted at the University of Queensland in Brisbane and the University of Bristol in the UK, indicate the potential for cranberry phenols to modulate the pathogenicity of dental plaque.

The objective of the study was to continue testing natural components from fruit as bacteria inhibitors, and to further the research of their effects on oral health.

The researchers tested high-quality extracts, prepared as bioactive molecules from cranberries, blueberries and strawberries, as well as a combination of the three berry extracts called Orphenol, on 24-hour-old Streptococcus mutans biofilms and compared them to the effects of a vehicle control.

The study found that higher concentrations of cranberry extract significantly reduced the bacteria’s metabolic activity and acid production and bacterial exopolysaccharide biovolumes, as well as resulted in a less compact architectural structure than that of the control-treated biofilms. Orphenol also had a significant impact, but slightly lower than that of cranberries. Only the highest concentration level of blueberry extract significantly reduced metabolic activity and acidogenicity, but did not significantly affect the biovolume or biofilm architecture. The extract from strawberries had no significant impact on any bacterial activity. No extract killed the bacteria.

Continued research goes into fruit extracts for oral health care and bacteria management.

SINGAPORE: Recently the Association of Orthodontists (Singapore) Congress (AOSC), organised by the Association of Orthodontists (Singapore), took place at the Marina Bay Sands hotel in Singapore. With an abundance of relevant information and an increase in attendees over the previous year, organisers of the event believe it reaffirms the show’s position as the must-attend orthodontic event in the Asia Pacific region.

With an increase of 20 per cent over the previous year’s numbers, more than 900 professionals from as far away as Oman came together to attend the three-day event. “We are humbled by the overwhelming response received at our sold-out workshops and staggering delegate numbers. Additionally, the steady growth of delegates attending from international countries also marks a great achievement for AOSC. We are proud to have grown from a locally reputable show to one that is increasingly being recognised internationally within the orthodontic community,” said Dr Mohan Senathirajah, President of the Association of Orthodontists (Singapore).

Attending this year’s event were key opinion leaders such as Profs. David Sarver, Birte Melsen and Rolf Behrents. Additionally, 30 exhibiting companies and over 100 represented brands were present at the exhibition held alongside the conference. Attendees of the congress were able to gain information about the latest products and innovations in the industry, with leading orthodontic companies such as Invisalign, Ormco, Dentsply Sirona and others participating.

Other events that took place during the congress included the Residents’ Symposium. Attended by over 80 participants, attendees were treated to an afternoon of insightful discussions and a tour of the new National University Centre for Oral Health, Singapore. Another highlight of the congress was the scientific poster competition, which saw a doubling of entries. After a series of pre-event activities to raise funds for the Children’s Cancer Foundation, a cheque for SGD12,000 was presented to Neo Lay Tin, executive director of the foundation, at the opening ceremony of the congress.

“From our modest beginnings back in the days, we have since scaled greater heights by attracting over 900 attendees and expanding our exhibition space. Riding on this wave of success, we will strive to continue to develop the show alongside the community,” concluded Dr Seow Yian San, chairperson of the AOSC 2019 organising committee.
Frustration of being unable to anaesthetise a patient sufficiently?

By DTI

Many clinicians have experienced the frustration of being unable to anaesthetise a patient sufficiently despite trying various approaches or using a combination of amides. A variety of failures are known by specialists, for example, one spot in a tooth cannot be touched, everything is numb except the tooth, the last bit of caries cannot be removed without pain or intra-pulpal injection is the last option in the case of irreversible pulpitis, et cetera. Mandibular teeth are the most common teeth to be associated with the failure of anaesthesia and it is even more frustrating that it usually concerns the same patients, therefore the specialist tends to become nervous when the patient’s name appears in the appointment book once again.

The main problem with failing anaesthesia lies with the dental curriculum, because dental schools do not allocate enough time, lectures and practical sessions to the subject. Often, the topic is interspersed within different subjects and it is assumed that students assimilate the information and will apply it successfully in the clinic. Infiltration anaesthesia, mandibular nerve block anaesthesia and intra-mental anaesthesia are probably taught in every dental school as the “mainstream” techniques. However, what one should do in case of failure probably depends more on who is involved in teaching the course. A plethora of solutions are taught in dental school by different clinical teachers, ranging from combining amides and combining techniques to increasing the dosage or using a combination of amides. A desultory approach to increasing the dosage or the number of infiltrations, for instance. The comfort of the patient is paramount and the dentist will be.

The principle of intraosseous anaesthesia is not new. It was first described in 1906 by Dr Cavaroz, who introduced direct injection into the cancellous bone as a better alternative to mandibular nerve blocks (known as the Halsted block). In fact, every infiltration anaesthesia is an intraosseous anaesthesia. The reason why it works relatively well in the maxilla, in contrast to the mandible, is because the cortical plate is thin and porous in the maxilla.

Unlike nerve block anaesthesia, the key to provide successful dental local anaesthesia is intraosseous anaesthesia, which allows the anaesthetic to reach any nerves, irrespective if plain or adrenaline-added solutions are used. There does not seem to be an answer.

The literature is inconclusive about which techniques should be used, however more and more evidence of anatomical variations in the innervation of teeth surfaces have been found, as dental and maxillofacial radiologists diagnosed and identified neurovascular canals on CBCT images. These variations in anatomy were unknown or overlooked for many years, which explains why, for over 100 years, dental local anaesthesia has not seen a lot of innovation. However, now that there is evidence of mandibular and maxillary anatomical variations in innervation, the knowledge should be applied to ensure profound and efficient dental local anaesthesia for all patients. Therefore, if local anaesthetic can be administered directly into the cancellous bone, the teeth will become anaesthetised irrespective of which nerve branch provided innervation to the teeth or a particular tooth. It sounds simple, and it is.

The principle of intraosseous anaesthesia is not new. It was first described in 1906 by Dr Cavaroz, who introduced direct injection into the cancellous bone as a better alternative to mandibular nerve blocks (known as the Halsted block). In fact, every infiltration anaesthesia is an intraosseous anaesthesia. The reason why it works relatively well in the maxilla, in contrast to the mandible, is because the cortical plate is thin and porous in the maxilla.

Therefore, the cortical plate of the mandible requires to be perforated in order to administer the local anaesthetic successfully and efficiently. This technique can obviously also be used in the maxilla. Advantages of the technique include the minimal collateral anaesthesia (no numb lip and no numb tongue), the immediate onset of the anaesthesia, the relatively short duration of the anaesthesia (depending on the volume injected and the concentration of the vasoconstrictor) and the fact that multiple quadrants can be treated in one visit, causing minimal discomfort for the patient. The key to success is the slow injection of the anaesthetic, which allows for the product to diffuse gently into the cancellous bone, causing profound and reliable anaesthesia of the pulp of the tooth, the tooth’s periodontal ligament and the attached gingiva. Additional soft tissue anaesthesia is required if more elaborate treatment than simple restorative treatment is planned—a simple exodontia or deep calculus removal, for instance. The comfort of the patient is paramount and when the patients are comfortable, so will the dentist be.
Recent study investigates dental anxiety and dental behaviour in children

By DTI

MANGALORE, India: A key reason behind people not attending regular oral health check-ups can be anxiety stemming from their first experience in a dental setting as a child.

In a recent study, researchers from India investigated whether there is an association between the temperament characteristics of children 3–5 years old, dental anxiety, and their dental behaviour. Results were gathered over three check-ups, with the aim of determining the effectiveness of behaviour management techniques such as tell-show-do and live modelling.

In the study, led by Dr Baranya Shrikrisna Suprabha from the Department of Paedodontics and Preventive Dentistry at the Manipal College of Dental Sciences, the researchers examined 100 children aged 3–5 years who were attending their initial dental visit accompanied by a parent.

Speaking to Dental Tribune International, Suprabha said, “When we reviewed the literature, the role of temperament in the dental behaviour of preschool children during the initial dental visit was unclear. Earlier studies had been carried out in older age groups of children and not necessarily during the initial dental visit. The association of temperament with dental anxiety, which has been shown to have an important role in the behaviour of the child in the dental clinic, was also investigated.”

During the initial oral examination of the children and their oral prophylaxis, the behaviour of the children was measured using the Frankl’s behaviour rating scale, and temperament was assessed using the Emotionality, Activity, Shyness Temperament Survey for Children. “The facial image scale used to assess the anxiety in our study has been shown to have good validity and reliability. Though we did not assess the validity and reliability again, all children responded easily to the scale,” explained Suprabha.

According to the study’s results, techniques like live modelling and tell-show-do are very effective in modifying a child’s behaviour. Additionally, children showed improvement in their behaviour with every subsequent visit. The researchers noted that proper assessment of children’s behaviour helps the dentist to execute the required treatment plan in the most appropriate manner.

The study, titled “Association of temperament with dental anxiety and behaviour of the preschool child during the initial dental visit”, was published on 6 February 2019 in the European Journal of Oral Sciences ahead of inclusion in an issue.

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Auckland, New Zealand: Scientists in New Zealand have developed ChewIt, a novel user-configurable interface device worn in the mouth. The prototype, which is no larger than a piece of chewing gum, may soon allow people to answer their phones by simply biting on the soft ChewIt casing.

The research project in which ChewIt was developed was led by Dr Suranga Nanayakkara, an associate professor at the Auckland Bioengineering Institute who made international headlines in recent years with another prototype device, the FingerReader. Wearing it on a finger, the user points at words, such as those on the spine of the book or in a restaurant menu, and these are then translated to voice.

The custom-made flexible printed circuit board of the tiny ChewIt is fully encased, allowing users to pop it into their mouths. It allows for discreet and hands-free interaction with a phone, computer and smartwatch, among other devices, even while riding a bicycle. The wearer can use it to cancel a phone call or even to control a wheelchair. During the pilot test, users kept the device in their mouths for 30 minutes and reported no discomfort.

In his research, Nanayakkara wishes to address what he says is a mismatch between what technology has to offer and innate human behaviour. Owing to this, his research is focused on developing technologies that are more responsive to innate human behaviour instead of obliging humans to adjust to the requirements of the technology. “We want to design and develop systems that can understand the user, rather than us having to tell the technology what to do every time—technologies that can understand us much better than technology currently does,” he said.

He considers such technologies “assistive augmentation”: “It’s when the system understands the abilities, behaviours and emotions of the user, and when the system is unobtrusive and integrated with our body or our behaviour,” Nanayakkara explained. According to him, assisted augmentation should be concerned with strengthening and extending the users’ physical and sensorial abilities while allowing them to do what they could not do before.
Researchers discover new material that could make dental fillings more durable

By OEMUS MEDIA

PORTLAND, Ore., U.S.: A recent study has found that a compound used to make car bumpers more robust and protect wood decks could make dental fillings last twice as long. The results of the investigation will help design full-formulated adhesives to be tested in clinically relevant conditions, and as a result, dental patients could reduce the number of visits to the dental office.

A team of researchers at the Oregon Health and Science University School of Dentistry has developed a doubly resistant filling material that may help reduce dental visits and prevent extensive treatment. Dr. Carmen Pfeifer from the Oregon Health and Science University School of Dentistry has developed a doubly resistant material that could make dental fillings

COLOGNE, Germany: Each year, annual design awards have recognised dental bauer’s outstanding creative contributions to innovative practice design. This decades-old division has now been given a new name: DESIGN CONCEPT. As a symbolic example of a range of themes on offer, “bluemarina” is an exclusive maritime-themed range which consists of an elegant treatment unit with matching furnishings.

Both elements of the concept were inspired by the legendary Riva Yacht and the associated carefree lifestyle on the Mediterranean coasts of Europe in the sixties. The Mediterranean dolce vita flair is combined with patient comfort and functionality, hygienic and technical standards all made in Germany, as well as stylish exclusivity.

The treatment unit inspires with its detail-rich, timeless elegance in combination with state-of-the-art modern technology. The ergonomic shape, the comfortable soft padding with its aesthetic stitching and all-round upholstery piping, and the premium mahogany and maple wood armrests all perfectly match the special maritime colour livery of pure white, pearl night blue and turquoise. If the customer desires, other colour combinations are also possible. Chrome elements add further highlights to the yacht look. A light-hearted gimmick is an optional motorboat sound when the reclining position is adjusted.

White body, blue stripes, rosewood and stainless steel—the yacht design of the “bluemarina” treatment unit seamlessly integrates with that of its furniture system. The fronts and the worktops not only inspire with their maritime design features, but also functionally fulfill all of the hygienic requirements of a modern dental practice. The nautical look in form and fabric is finished with recessed LED lights in high-gloss varnished wood.

The new design world from dental bauer presents a revolutionary product for dentistry, underlining the company’s passion for transforming the individual design dreams of its customers into reality. Presented well on schedule at IDS, “bluemarina” can be ordered as a limited edition from April onwards.
Prof. Jörg Strub receives the fifth P-I Brånemark Award

By DTI

The fifth annual P-I Brånemark Award for Lifetime Achievement in Dentistry has been given to Prof. Jörg Strub of the University of Freiburg in Germany. Strub received the prestigious accolade in absentia, with his colleague and friend Dr Kenneth Malament accepting it on his behalf.

At the award ceremony, Malament reminded an assembly of Strub’s colleagues and friends that he “is an individual who has put his whole life into dentistry—there is simply no one like him. He is the best of his generation,” Malament said.

Mark Ferber, founder of Channel3, which presents the award, told Dental Tribune International that “Jörg Strub has perfectly represented, throughout his career, the five characteristics of Prof. Brånemark, on which the award is based. Dr Strub is a scientist, a clinician, an educator, a humanitarian, and a sage.”

Strub received his DDS, Dr Med. Dent. and Dr Med. Dent. Habil degrees from the University of Zurich in Switzerland in 1975 and 1985, respectively. Since 2001, he has been Associate Dean for Clinical Affairs at the University of Freiburg.

Established in 2015 in honour of Swedish physician and father of modern implantology Prof. Per-Ingvist Brånemark (3 May 1929 to 20 December 2014), the eponymous annual award recognises exceptional clinicians who have advanced dentistry for the well-being of society. The first award was given in 2015 to Dr Myron Nevins of Boston in the US. In 2016, Dr Tiziano Testori of Lake Como in Italy received the second award. Dr Istvan Urbán of Budapest in Hungary received the third award, in 2017. The fourth award was given to Dr Michael Cohen, founder of the Seattle Study Club, in 2018.

This year’s award was presented in the OEMUS MEDIA and Dental Tribune International IDS media lounge on Thursday.

ROOT SUMMIT community meets at the 38th IDS in Cologne

By DTI

On Thursday, friends and members of the ROOTS SUMMIT community gathered at the 38th IDS in Cologne for coffee and croissants. The brunch provided an opportunity to discuss next year’s meeting, which will take place at the Cubex Centre Prague from 21 to 24 May in Prague in the Czech Republic.

After the success of ROOTS SUMMIT 2018, the anticipation for next year’s event is high. Co-chairman Stephen Jones said, “Before ROOTS SUMMIT 2018 had finished, we began planning ROOTS SUMMIT 2020. We knew we were going to have a challenge matching the quality and depth of the programme we had in Berlin, but our scientific chairman, Dr David Jaramillo, has managed to put together another outstanding programme. We have nine of the top speakers in endodontics, and we also have the pleasure of having Dr Maxim Belograd give us his perspective on how to increase your endodontic success from a restorative point of view.”

Other notable speakers at ROOTS SUMMIT 2020 include Dr Jaime Silberman and Prof. Matthias Zehrader. A final programme will be available on www.roots-summit.com within the next few days, and registration will open on 21 May 2019. More information about the event can be found on its Facebook page (@roots-summit2020).

Dr Kenneth Malament (left) accepting the P-I Brånemark Award for Lifetime Achievement in Dentistry on behalf of Prof. Jörg R Strub, with Mark Ferber (middle), founder of Channel3, and Dental Tribune International CEO Torsten Oemus. (Photo: Luke Gribble, DTI)

Attendees at the Channel3 right held at the OEMUS MEDIA/Dental Tribune International lounge on Thursday. (Photograph: Luke Gribble, DTI)

Dr Sarah Fitzharris, founder of the Fitz Fehey Academy, looks on during the award ceremony. (Photograph: Luke Gribble, DTI)

Action shot from the Channel3 right held at the OEMUS MEDIA/Dental Tribune International booth. (Photograph: Luke Gribble, DTI)

Dental Tribune International CEO Torsten Oemus with attendees from the Channel3 right. (Photograph: Luke Gribble, DTI)

Prof Tiziano Testori (middle) from the Lake Como Institute with attendees at the Channel3 booth party. (Photograph: Luke Gribble, DTI)

From left: ROOTS SUMMIT Co-chairman Dr Freddy Belliard, Event organiser Sarah Schubert and ROOTS SUMMIT Co-chairman Stephen Jones (Photograph: Robert Strehler)
**Interview: “We definitely passed a tipping point for 3-D printers”**

By Brendan Day, DTI

**powered by 3D Systems’ proprietary Figure 4 technology, the NextDent 5100 is a high-speed dental 3-D printer designed to save time for both patient and practitioner. Dental Tribune International spoke with Rik Jacobs, dental vice president and general manager at 3D Systems; Sebastiaan Cornelissen, CEO of Cordent and Core3dcentres; and Dr Michael Scherer, an American prosthodontist, about the NextDent 5100 and future trends in dentistry.**

**Is the NextDent 5100 designed specifically with the dental lab in mind, or can it be used in a dental practice as well?**

**Rik Jacobs:** Essentially, I designed this product to be used by both labs and clinicians with success.

**Sebastiaan Cornelissen:** We found that the most important thing was to have a system that can incorporate multiple machines and multiple materials if necessary. This flexibility was the main feature that we were looking for, and the NextDent 5100 delivers this.

**What are the benefits of the NextDent 5100 for dental labs?**

**Cornelissen:** In the dental lab, you have similar time pressure issues to a dental practice. You need to be able to produce things fast, in multiple colours and often in large quantities. To be frank, these are all easily achievable with this printer.

**Often, a dentist will send some scans to us so that we can quickly create a smile design for the dentist to print a mock-up of in his or her office.** Though we are based in the Netherlands and have clinicians working with us from Germany, the NextDent 5100 allows for this entire procedure to be conducted in less than 2 hours.

**What has the feedback been since the launch of this printer? What have customers most liked about it?**

**Jaco:** What was important for us, besides what these gentlemen have already mentioned, was that the printer have a high level of accuracy. With ten years of experience in the 3-D dental printing industry, I’ve learnt that a lot of printers work fine in the beginning but lose their accuracy over time. When 3D Systems acquired my company, we decided to make sure that our printer would work with our issue, day in and day out, for at least three years. Flexibility, speed, accuracy and, ultimately, affordability of the machine and the material — these along with training and ongoing support from our outstanding resellers, are the foundations of the NextDent 5100.

We got a lot of feedback from users of this printer, like Michael and Sebastiaan, and thankfully, our R & D team in San Diego really listened to what they asked for. For what the market asked for, I think this is what our company should always do: Listen carefully to our customers and deliver what they need and want.

**Are software updates included?**

**Jacobs:** Automatically. As long as the user is connected to the Internet, he or she will be able to have the latest updates automatically downloaded to the printer.

**It’s predicted that, within three to five years, more than 50 per cent of dental labs globally will have an in-house 3-D printer. What, in your opinion, is driving this growth?**

**Jacobs:** Well, in 2016, we definitely passed a tipping point for 3-D printers here at 3D Systems. Thanks to easier registration, certification, improved ease of use, and a range of other factors, it has become much more achievable to integrate a 3-D printer into one’s daily workflow.

**Scherer:** Clinicians are now expecting dental labs to be digital and to have printing capabilities. It’s no longer a case of whether a lab will take your files, but rather if they print themselves or still source it. That’s how fast 3D printing has grown in dentistry.

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**Interview: “We intend to ultimately develop a daily use oral care product with a natural substance”**

By DTI

**The fight against dental caries has been approached from many different angles in which patients can protect and improve their oral health. After much intended to contribute to a recently published article on a study into the potential use of berry extract to combat decay-causing bacteria, Dr. Nebu Philip, a dentist, has been involved. He spoke with lead researcher Dr. Nebu Philip, from the University of Queensland in Australia, to discuss this new discovery in more detail.**

Dr. Nebu Philip, the study sounds very interesting. How did the idea for the research topic arise, and who are you working with?

We were interested in developing natural products that could potentially be used to complement fluoride in dental caries prevention. Although there has been extensive literature suggesting the use of natural products for preventing dental diseases, the vast majority of natural product research studies in dentistry are laboratory-based and have not progressed to clinical usage.

I am part of the broad research group called Advanced Materials and Technologies, which is headed by Dr Laurence Walsh. Under this group we had a sub-group focusing on natural products and dental caries — which includes Drs Walsh, Leishman, Randara and myself. I was the lead researcher of the natural product study, with the group coming together three years ago at the beginning of my PhD programme.

What was the basis of your research concept?

We sought to identify an appropriate natural product. Dark coloured fruit berries are known to contain a variety of phytochemicals beneficial to health. The availability of commercial fruit berry extracts with standardised phytochemical concentrations offered the possibility of testing these polyphenol-rich extracts against key cariogenic bacterial virulence properties. We progressed from a series of laboratory studies to a double-blinded randomised controlled trial in high caries-risk patients. We have presented all these studies and are planning our next clinical trial in a larger cohort of patients.

What do you think the most interesting results were?

The ability of the berry extracts, especially the cranberry extract, to significantly inhibit Streptococcus mutans virulence without affecting bacterial viability was probably the most interesting result. This suggests the possibility of incorporating the cranberry extracts into a daily use oral care product, for example a mouthwash or dentifrice, to reduce cariogenic virulence without affecting health-associated bacterial species in dental plaque, an important advantage over currently used synthetic agents, like chlorhexidine.

Do you have further research plans to develop a new oral health product?

The results of our first clinical trial were encouraging. After further clinical studies, we intend to ultimately develop a daily use oral care product with a natural substance incorporated into it to protect against dental caries. Watch this space!
New realistic mouth models aim to improve dental education

By DTI

BIRMINGHAM, UK: New research being carried out in collaboration with the University of Birmingham will allow dental students to train on dental models that possess the tactile qualities of real mouths. Among the applications will be learning how to use periodontal probes to check for periodontal disease. The project is being run by Dr Michael Milward, a reader and honorary consultant in periodontics at the university’s School of Dentistry. Dr Paul Cooper, Professor of Oral Biology at the school; and Richard Arm, a senior research fellow at Nottingham Trent University in the UK. The models feature realistic gingivae and tongues to allow students to learn how to examine the mouth and check for disease safely. Both the tongue and the gingivae are made from synthetic gels and fibres and vary in hardness to mimic living tissue, whereas the teeth and jaw bones are made from bone-simulating resin.

“These models meet an unmet need in dental education and will allow us to better prepare our students for clinical work,” said Milward. “The feedback we have received from students and staff has been extremely positive and the final version has already been introduced into undergraduate teaching,” he continued. “While some models are commercially available, no models combine the replica hard and soft tissues in this way to provide a realistic learning experience.”

According to Milward, these developments provide a huge step forward in dental education and benefit not only dental students, but also the retraining dental workforce and patients. The researchers aim to further enhance the models to allow dental students to evolve additional clinical skills.

“The aim is to give students the psychological experience of how it feels to perform real dentistry, but in a safe learning environment,” said Arm. “Until now, current dental models haven’t provided a realistic enough experience for students and the inclusion of a tongue will mimic the challenge which dentists face and better prepare them for their first clinic.”

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Importance of radiography in dental treatments

By Dr Ellie Nadian

**Periapical radiographs**

A periapical radiograph is an intra-oral radiograph. Intra-oral simply means that radiograph is taken with the film inside the mouth, but the radiographic machine would be positioned outside the head. Periapical radiographs are used to view teeth, roots, apices, and surrounding bone and tissue.

Periapical means around the terminal end of a root. In other words, a periapical radiograph is taken to show the tooth from the crown of the tooth to the tip of the root. Periapical radiographic films are available in three sizes. We use Size 1 for children and Size 2 for examining anterior and posterior teeth in most adults.

**Bitewing radiographs**

A bitewing is an intra-oral radiograph that is taken to examine the crowns of both maxillary and mandibular teeth. Bitewing radiographs are used to show the spaces between the teeth. They are used to locate cavities on the interproximal surfaces of the teeth and thus do not provide an image of much of the surrounding tissue. In simple words, the main intent of the bitewing is to detect caries between the teeth. The dental bitewing is also a useful tool for detecting periodontal conditions and bone levels between teeth. It can be used to detect changes in bone density due to periodontal disease. Bitewing radiographs can also be used for the detection of calcium build-up. A bitewing film has a tab attached to the film. That tab is known as the wing of the film and the patient bites on that wing to hold the film inside the mouth.

**Bitewings can reveal:**

- interproximal caries at early stages;
- small cavities;
- secondary caries under fillings;
- the outline of fillings;
- previous treatments under fillings;
- and bone loss in the early stages of periodontal disease.

**Panoramic radiograph**

A dental panoramic radiograph may be used as a preliminary survey of a patient’s teeth. A panoramic radiograph provides a panoramic view of the jaws. It allows visualisation of all dental arch and adjacent regions with only one radiograph exposure.

The panoramic radiograph is the most often used extra-oral radiograph in dentistry; however, it has limitations for conservative dentistry because the quality of the image is not adequate to detect early carious lesions. Therefore, a panoramic radiograph is used for initial oral examination and may not eliminate the need for intra-oral radiographs. Sometimes, a dentist may need a combination of a panoramic radiograph and follow-up intra-oral radiographs. A panoramic radiograph is not a substitute for intra-oral radiographs, but a supplement. However, some dentists find panoramic radiographs to be more child-friendly because there is no need to place a film in the mouth of an anxious child.

**CBCT**

CBCT machines are designed to provide 3-D visualisation of dental tissue at relatively low radiation doses. A CBCT machine can also reconstruct a panoramic image, sparing the patient the exposure for a panoramic radiograph.

Some CBCT machines can reconstruct bitewing and periapical radiographs as well; however, the current dose of CBCT machines does not support use of CBCT for routine and standard caries detection. CBCT may be used for assessment and planning prior to a complex dental surgery or when routine examination and standard radiographic images are inconclusive for the detection of a vertical root fracture. For more information regarding indications for CBCT, readers are directed to Nicholas Drage’s paper “Cone beam computed tomography (CBCT) in general dental practice”.

Currently, we are referring our panoramic radiograph and CBCT patients out; however, we are studying our options to purchase a CBCT/panoramic radiograph machine. Our dentists provide emergency dental services in Brisbane and panoramic radiograph/CBCT services are closed after hours and over weekends. Patients who are in agonising pain from an abscessed third molar on a Friday night suffer with having to wait until Monday for a panoramic radiograph or CBCT scan. We believe we would be able to provide them with better services when we acquire a CBCT machine.
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