The role of the hygienist in the twenty-first century

By Victoria Wilson, UAE

Since the recent launch of the Emirates Dental Hygienists’ Club in the UAE, it could not be a more appropriate time to discuss the growing role of the hygienist in the twenty-first century. The prevalence of preventable dental disease within the region prevails, and the need for a focus on the core strategy to overcome such disease needs to be addressed.

The dental hygiene profession was founded over 100 years ago by Alfred Fones in the US for the promotion of oral health and prevention of disease. The fundamental ethical responsibility of the dental hygienist is the pursuit of the promotion and restoration of oral health. The dentist’s role certainly encompasses the promotion of oral health and prevention of disease in diagnosis and operative care; however, it is important to highlight that the main difference is that the scope of practice for a dentist is far greater than for a dental hygienist. This is where the significance lies in the strengths and key focus of these dental care professionals and the key role of both in overall sustainable oral health care for every patient in serving the public.

In a recent survey carried out among dental professionals in the UAE, it became evident that a very small percentage of dentists actually work with dental hygienists. It found further that a limited number of dentists are proactive about integrating hygienists into their practice model. This highlights the potential requirement to further incorporate dental hygiene into dentistry if the existing inequalities of oral disease are to be overcome. This will require an extended workforce of dental hygienists, the expansion of educational facilities and further efforts towards including dental hygienists in existing practices in both public and private health care.

Another recent survey carried out in the region asked dentists how many of their patients are healthy. Regrettably, only a very small percentage reported having patients with good oral health. This again highlights the need for the skill set of the dental hygienist in oral health promotion and prevention of disease.

According to the findings of a further survey in the region, dental hygienists felt that very little of their total skill set was being utilised. This reflects the further need to ensure current dental hygienists’ skills are being used to the maximum potential.

In a European report, it has been identified that the UK, Spain, Sweden and Switzerland are ranked as the healthiest in Europe in relation to the low prevalence of severe periodontal disease, supporting the role of the dental hygienist in countries where a facilitative medicolegal framework exists to allow the inclusion of dental hygienists in effective periodontal care. It has also been identified in an international report that oral health needs and the delivery of care are partly mismatched, indicating a further need for the development and integration of the role of the dental hygienist. It has been proposed that advancing education in dental hygiene will achieve better oral and overall health for more people, by transforming the way dental hygiene graduates are prepared for the future to serve the health and wellness needs of society. Increasing clarity on the identity of the profession will affect how it is perceived by the public. In order to reach this point, every member of the dental team needs to be fully on board regarding the role of the dental hygienist and invest time in achieving the optimal success.

A global re-evaluation of requirements is needed to ensure that there is greater utilisation by hygienists in the provision of dental care with efficient and effective use of health care resources. Through evaluating the dental profession’s ability to provide care within the core skill sets, it is mandatory that the necessary steps be taken to ensure maximum effectiveness of an integrated dental and health care profession to optimise on reducing the prevalence of preventable dental disease.

It has been advised in a recent extensive report that future public health care policies will be orientated towards recommending behavioural support and adopting the common risk factor approach for oral health promotion. Dental hygienists in public health care settings can positively affect patients by offering preventive care outreach services. Improvement in the quality of life for individuals was noted through improved health outcomes.

In light of the growing profession, it is reassuring to know that companies supporting the profession of dental hygiene, such as Young Dental, will now be accessible to hygienists in the region. Accessibility to certain resources has previously been limited, and it is of key importance that the profession be supported and have access to quality products in the innovation of dental hygiene. Young Dental partners with hygienists in order to understand their everyday needs and develops products that meet the requirements of the profession, such as Vera Advanced Bright Prophy Paste.

Young Dental is kindly sponsoring my lecture and at AEDDC can be found in Hall 6, Booth C09.
Discover the Turkish dental market at IDEX 2016

The Istanbul Oral and Dental Health Apparatus and Equipment Exhibition (IDEX) is one of the largest trade fairs in Turkey and offers leading companies in the dental industry the opportunity to present their products to customers from all over the world. With 30 years’ experience, CNR Expo will be organising IDEX for the 13th time from 14 to 17 April 2016. Located just across the international airport and with a rebooking rate of over 90 per cent, the CNR Expo centre offers a favourable platform for exhibitors. The number of exhibitors and visitors at IDEX has multiplied over the last four years.

As a showcase of technology and innovations in dental equipment with both local and global brands represented, IDEX has recently become the most significant exhibition in Eurasia.

In 2014, 325 exhibitors presented their products at IDEX, including 51 international and 274 national companies. Over 9,000 visitors, including almost 800 guests from abroad, attended the exhibition.

Health and dental care are among the most import-dependent industries in Turkey. The dental equipment import rate is 2.5 times higher than the export rate, amounting to US$50 million (€44 million) per year. The overall dental market in Turkey is currently valued at US$170 million (€150 million) and is growing steadily at a rate of 6–7 per cent annually. The number of dentists in Turkey has increased significantly within the last five years. In 2014, there were about 25,000 dentists and 38 universities in Turkey had dental faculties. Turkey is also considered an emerging market for medical tourism. Total health care spending in Turkey is forecast to reach US$69 billion (€61 billion) by 2016.

Call for clinical case submission

In anticipation of its global conference, to be held from 26 to 29 May 2016 in Barcelona, dental implants manufacturer MIS Implants Technologies has announced an opportunity for young clinicians to present clinical cases and techniques focusing on challenging situations in implantology. The best cases submitted will be presented on the first day of the conference.

The first prize winner will be invited to a course by implant specialist Dr Eric Van Dooren, including flights and accommodation. The 2016 MIS Global Conference, subtitled 360° Implantology, aims to expand knowledge and introduce true innovation under the theme of “VCONCEPT: Set the volume of bone and soft tissue”, and will include lectures, clinical case presentations and hands-on workshops.

Experienced professionals will explore the VCONCEPT by providing a broad background on the current evidence-based therapeutic trends in implant dentistry and presenting the latest treatment modalities that fulfil MIS’s philosophy of “Make it Simple”, particularly the V3 implant system.

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Traditionally, dentists have been taught that both dental caries and periodontal disease develop and progress as a direct result of patients' over-frequent consumption of refined sugars and patients' failure to remove bacterial plaque effectively. Miller's acidogenic theory of caries development and the non-specific plaque hypothesis based on Löe's work in the 1960s allow dentists to present a simple cause-and-effect explanation to patients.

Since then, the dental profession has blamed patients' poor oral hygiene for periodontal breakdown and dental caries while often failing to diagnose and treat other contributing causative factors. Unfortunately, while plaque is generally a necessary ingredient of common dental diseases, the explanation contained in these theories of its pivotal role is simplistic given current knowledge. This brief article will attempt to put the more significant risk factors in context.

Plaque

Gingivitis is a natural bodily response to bacterial accumulation and as such is non-specific. Effective plaque removal will generally reverse gingivitis. The concept of inevitable progression from gingivitis to destructive periodontitis if oral hygiene is not good is, however, flawed. Figure 1 shows a 46-year-old patient with non-existent oral hygiene over several years. Figure 2 shows the same patient one month later after around 90min of scaling and polishing by a student dental hygienist. He had no active caries and no more than 10% bone loss.

It has become increasingly evident that while some patients are "susceptible" to periodontal breakdown, others are more "resistant". Common among these host-based factors leading to greater breakdown are the presence of diabetes and a smoking habit.

Diabetes

Several authors have demonstrated a clear relationship between degree of hyperglycaemia and severity of periodontitis, and the risk of cardio renal mortality (ischaemic heart disease and diabetic nephropathy combined) is three times higher in diabetics with severe periodontitis than in diabetics without severe periodontitis. Javed et al. showed that scaling and root planing in prediabetics reduced glycated haemoglobin (HbA1c) by 1% at three months, and reductions in HbA1c of 0.3–1% have been confirmed in several other studies in both Type 1 and Type 2 diabetics. There are estimated to be 745,940 diabetics in the United Arab Emirates. In 304,000 of those cases, the condition has not been diagnosed, and 934,300 people have impaired glucose tolerance, a prediabetic state.
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of hyperglycaemia, or elevated levels of blood sugar. In the UK Prospective Diabetes Study, it was shown that Type 2 diabetics who reduce their HbA1c level by 1% are 19% less likely to suffer heart failure and 43% less likely to suffer amputation or death due to peripheral vascular disease.

Clearly, not only will control of diabetes facilitate management of periodontitis, but also, probably more importantly, effective management of periodontitis is likely to have major beneficial effects on the serious sequelae of diabetes. Unfortunately, the medical profession is largely ignorant of the potential benefits of establishing and maintaining periodontal health. The publication Type 1 Diabetes in Adults: National Clinical Guideline for Diagnosis and Management in Primary and Secondary Care (updated in July 2014) was compiled by a consensus reference group made up of 30 members. These included physicians, endocrinologists, nurses, ophthalmologists, dieticians, podiatrists and lay people, but no dentists. Its 153 pages make no mention of dentistry or periodontal disease. The National Institute for Health and Care Excellence document on Type 2 diabetes, also updated in 2014, too fails to mention dentistry or periodontal disease.

Smoking
We have known for over 20 years that smoking increases the risk of periodontalbreakdown. Odds ratios for developing periodontal disease as a result of smoking constitute a range: 2.5–9.97 for current smokers and 1.68 for former smokers, and 3.25 for light smokers to 7.28 for heavy smokers. A smoker with 20 pack years (20 cigarettes per day for 20 years) is up to 600% more likely to lose teeth owing to periodontal disease, whereas a patient with poor plaque control has around a 15% risk of progressing to destructive periodontitis. Why then do we refer to hygiene phase therapy when smoking is a much greater risk factor than poor plaque control? How many dentists spend as much time on smoking cessation counselling as on oral hygiene instruction?

Sugar
Traditionally, teaching on caries prevention has focused on the number of sugar exposures per day, especially between meals. Academic paedodontists suggest that provided there are two daily exposures to fluoride in toothpaste, a maximum of six sugar exposures a day is unlikely to lead to significant enamel decalcification in children. However, a large study conducted in 2015 by Bernabe et al. evaluated 1,702 adults over 11 years and concluded that “the amount of, but not the frequency of, sugars intake was significantly associated with DMFT (decayed, missing and filled teeth)” throughout the follow-up period.

It thus appears that, at least in adults, “how much” is more important than “how often” with regard to sugar consumption. This is all the more significant since DMFT measures real outcomes over significant time spans, while many studies on both caries and gingivitis are very short term and use surrogate outcomes, such as decalcification on an enamel sample, or plaque and gingivitis indices as the basis of their conclusions. Patients are only really interested in real outcomes.

Obesity
The third National Health and Nutrition Examination Survey showed that body mass index was significantly associated with periodontal disease. Other studies have indicated a less strong association, and with the compounding variable of blood sugar levels in prediabetics, it is presently unclear whether obesity is in fact an independent risk factor or is associated with the established role of diabetes. Regardless, obesity is a known risk factor for Type 2 diabetes and cardiovascular problems, and as part of the dental professionals’ role to inform patients of these interrelationships.

It is likely that comprehensive periodontal treatment of all obese/prediabetic patients would be significantly less costly and, hopefully, result in few if any fatalities.

Conclusion
It is clear that the simple story of plaque control preventing progression of common dental diseases is largely fiction rather than evidence-based fact. While effective oral hygiene will always be a significant part of the management of dental diseases, the modern dental profession must be equally aware of the other common risk factors outlined in this article.

Contact info
A UK-certified specialist in periodontology, prosthodontics and restorative dentistry, Dr. Simon Bain is currently Professor of Periodontology and Director of Post-Graduate Periodontology at the Hamdan bin Mohammed College of Dental Medicine in Dubai in the United Arab Emirates. He will present two papers as part of the AEDDC 2015 scientific programme on Tuesday morning and Friday afternoon.
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9:30 – 10:00
Adverse drug reaction in oral cavity (Conference Hall A)
Speaker: Prof. Suara Ali Ahmed Foud Al Bayati

The role of meta-analysis in understanding caries data: Lessons from a high caries population (Conference Hall B)
Speaker: Dr Sharat Pani

9:30 – 10:15
Production of human dental applications
Speaker: Dr Ioannis Faklaris

11:15 – 12:15
Orthodontics
(Conference Hall A)
Speaker: Dr Robert Williams

Endodontics
(Conference Hall B)
Speaker: Martin Trope

11:45 – 12:45
An innovative way of biological adequate bone reconstruction prior to dental implant placement in the maxilla and the mandible (Conference Hall C)
Speaker: Dr Nito-Claudius Gelrich

12:00 – 12:45
Updates on orthodontic treatment planning with the use of temporary anchorage device (Conference Hall D)
Speaker: Dr Bilal Reifeldt

12:00 – 13:00
Is Pulp Inflammation A Pre-requisite for Pulp Healing and Regeneration? (Conference Hall F, French session)

12:00 – 12:45
Practical endodontic techniques for minimal intervention and contemporary restorative dentistry (Conference Hall B)
Speaker: Crawford Bain

12:45 – 13:00
The Forsus Appliance: Preclinical control (Conference Hall B)
Speaker: Prof. Angelo Putignano

12:45 – 13:00
Novel techniques to repair defective labial plate of bone deficiencies (Conference Hall C)
Speaker: Dr Abdelaziz Elaskary

10:00 – 11:00
Styleitaliano in the posteriors area (Conference Hall B)
Speaker: Dr Michael Dieter

10:15 – 11:00
Speaker: Dr Michael Dieter
The Forsus Appliance: Predictable Class II correction independent of patient compliance (Conference Hall D)
Speaker: Dr Ramesh Sabhlok

10:30 – 11:30
Minimum Intervention and contemporary restorative dentistry (Conference Hall F, French session)
Speaker: Dr Jean-Jacques Lasfargues

10:15 – 11:45
Plaque, sugar, obesity, diabatic and smoking: Reassessing risk factors (Conference Hall C)
Speaker: Crawford Bain

11:15 – 12:00
Panorally impacted canines: Clinical management and biomechanic control (Conference Hall D)
Speaker: Prof. Cirulli Muzzio

11:45 – 12:45
An update on reciprocation in endodontics (Conference Hall B)
Speaker: Asst. Prof. Elias D. Berdouses

11:45 – 12:15
Regenerative dentistry in endodontics (Conference Hall B)
Speaker: Dr Sai Kalyan S.

12:00 – 12:45
Is marginal loss around implants caused by a provoked foreign body reaction? (Conference Hall C)
Speaker: Prof. Christer Dahlin

12:45 – 13:00
Whiter than white (Conference Hall D)
Speaker: Dr Jasmine Kottait & Colin A. Muray

13:00 – 15:00
Prevalence and risk factors for early childhood caries in the sultanate of Oman (Conference Hall A)
Speaker: Dr Fady Hussein Fahim

14:00 – 15:00
The role of the dental hygienist in the 21st century (Conference Hall B)
Speaker: Dr Sagar J. Abichandani

15:00 – 16:00
The Bone Ring Technique: Results after five years with allografts in 3-D bone augmentation (Conference Hall A)
Speaker: Grein Yukel - Germany

16:00 – 16:45
Dental bleaching: I’m a hygienist, I can manage tooth sensitivity (Conference Hall A)
Speaker: Jasmin Kavakeb

16:00 – 17:00
Magnification: The first lesson in the language of “Global Dentistry?” (Conference Hall A)
Speaker: Dr Ihab Mohamed Ibrahim Eleyazy

Current aesthetics dilemmas (Conference Hall D)
Speaker: Thamer Theeb

16:45 – 17:30
A treatment planning simplified: Visualise before you actualise! (Conference Hall C)
Speaker: Dr Sagar J. Abichandani

Wednesday, 3 February 2016

9:00 – 9:45
Prevalence and risk factors for early childhood caries in the sultanate of Oman (Conference Hall A)
Speaker: Dr Fadya Al Nabhani

9:00 – 10:00
Regenerative endodontics: Current perspectives and future directives (Conference Hall E)
Speaker: Dr Sai Kalyan S.

9:45 – 10:45
Clinical concepts and new developments in regenerative periodontal therapy (Conference Hall F, French Session)
Speaker: Dr Ihab Mohamed Ibrahim Eleyazy

10:00 – 10:45
RCDD Digital Intern Management System: A two year evaluation (Conference Hall B)
Speaker: Dr Lilibeth Gaffud

10:45 – 11:00
Impact of 3-D planning on decision making and therapeutic...
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Thursday, 4 February 2016

9:00 – 10:00
Medical emergencies & collapses in the dental clinic, are you ready? (Conference Hall A)

11:15 – 12:00
Oral implantology (Conference Hall I, French session)
Speaker: Prof. Anton Sculean

12:15 – 12:45
Quality check of school-based sealant programme: The Kuwait experience (Conference Hall D)
Speaker: Dr Jimatra Aigma

15:30 – 17:30
Pearls of paediatric dental care (Conference Hall D)
Speaker: Dr Nabil Ouakil & Prof. Ali Attie

15:45 – 16:30
The future of dental hygiene practice: A practical application (Conference Hall C)
Speaker: Ms Victoria Wilson

16:30 – 17:15
Immediate loading: Surgical and prosthetic keys to success (Conference Hall E)
Speaker: Dr Dimitar Filtchev

17:00 – 18:00
Biological oriented preparation technique (Conference Hall A)
Speaker: Dr Antonio Dottore & Lamberto Villani

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TePe – We care for healthy smiles
and technical solutions (Conference Hall C)
Speaker: Drs Khairy Dalati & Faysal Succiara

11:30 – 12:30
Association between rheumatoid arthritis and periodontal diseases (Conference Hall F, French session)
Speaker: Dr Meddad Malika

11:45 – 12:45
Update in paediatric dentistry from UK: The “Hall” technique from Dundee to Dubai (Conference Hall A)
Speaker: Dr Iyad Hussein

12:00 – 12:45
Is the removable prosthodontics still in need? (Conference Hall D)
Speaker: Dr Ahmed Abd El Hamid

12:15 – 12:45
Dental implant treatment options for the terminal dentition and for the totally edentulous patient (Conference Hall E)
Speaker: Dr Rowad Samarani

13:00 – 14:00
Ethical dentists: Caring for the underserved (Conference Hall A)
Speaker: Prof. Jack Dillenberg

13:15 – 13:45
Prescribing medications for paediatric dental patients in GCC countries (Conference Hall B)
Speaker: Dr Manal Suliman Maashi

13:45 – 14:30
A 3-D approach for treating acute endodontic pain (Conference Hall D)
Speaker: Dr Fayeq Migdadi

14:45 – 16:30
The position of hyoid bone in different facial patterns: A lateral cephalometric study (Conference Hall E)
Speaker: Dr Mohamad Salah Amayeri

15:45 – 16:45
Molar Incisor Hypomineralization (MIH): Management consideration and challenges (Conference Hall B)
Speaker: Mawlood Kowash

15:00 – 16:00
Prescription medications for paediatric dental patients in GCC countries (Conference Hall B)
Speaker: Dr Manal Suliman Maashi

15:00 – 16:00
Restorative Dentistry (Conference Hall F)

16:00 – 17:00
Randomised controlled clinical study: Immediate, delayed immediate or conventional (Conference Hall A)
Speaker: Dr Tommaso Grandi

16:30 – 17:30
Evaluation of a new splinted implant design for immediate replacement of a wide mandibular molar (Conference Hall D)
Speaker: Prof. Mostafa Helmy Mostafa Ahmed

17:00 – 17:45
Dento-facial orthopaedics (Conference Hall E)
Speaker: Prof. Eyas Abuhijleh

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Avoiding common problems in tooth extractions

By Dr Kamis Gaballah, UAE

The last two decades have seen significant advances in restorative techniques and materials for dentistry. The latter, along with community-based preventive measures that aim to reduce the incidence of caries, have resulted in many patients living with functional teeth for a longer period. Yet, extraction of teeth forms the considerable bulk of the workload in oral surgeries owing to several factors, including the late presentation of patients with advanced dental disease, the presence of symptomatic impacted teeth, such as third molars, and the need to extract teeth for orthodontic or orthognathic treatment.

The extraction of teeth varies greatly based on the type of patient who is undergoing the procedure. For example, elderly patients with significant co-morbidities and on a complex combination of medication that might arise during extraction. The documentation of all complicating risk factors along with their potential postoperative morbidities is crucial and should be included in the informed consent. In the following article, other useful tips will be provided that are not usually included in traditional textbooks or lecture notes to help general practitioners to perform safer extractions.

During clinical examination, it has been proven useful to observe the patient's build. Tall and muscular individuals tend to have a long ramus with a higher mandibular foramen, and this increases the possibility of failure of the inferior dental nerve block procedure if the foramen is not taken into account when determining the height of the injection site. This can be aided by tracing the inferior dental canal (IDC) to the mandibular foramen in the pre-operative panoramic radiograph. The teeth of such individuals may also have longer and more curved roots and be embedded in highly dense, compact alveolar bone, and thus sectioning of the teeth may be required to ease the resistance. Racial differences should also be taken into account, as extractions of teeth from individuals of Afro-Caribbean descent tend to be more challenging owing to the hardness of their bone and divergence of roots in their molars.

The resistance of hard tissue should be expected, particularly if maxillary second and third molars are being extracted, as the potential for fracture of both the buccal plate and the tuberosity is relatively common when excessive force is applied with dental forces. Fracture of the tuberosity may produce irregular, sharp bone edges, significant soft-tissue laceration and potentially an orofacial fistula. If such risk factors are identified, tooth sectioning should be followed by elevation of roots with dental luxators instead of traditional elevators or forceps, which are known to deliver much higher force to the alveolar bone.

The indications for the extraction of impacted lower third molars (LM3) have been the subject of long-standing debate. Surgical procedures for the extraction of unerupted LM3 are associated with significant morbidity. This includes pain, swelling and the possibility of temporary or permanent nerve damage, resulting in altered sensa-
tion of the lip, chin, gingiva or tongue. Damage to the inferior dental nerve (IDN) is a well-known complication of surgical extraction of deeply impacted LM3. It should be acknowledged that this is not simply a loss of sensation; the damaged nerve can be responsible for a number of abnormal sensibilities, including sharp pain and abnormal response to stimuli, such as the perception of a light touch as a sharp stab. This can have a significant impact on quality of life for many patients.

Injury to the IDN may occur from compression of the nerve, either indirectly by forces transmitted by the root and surrounding bone during elevation or directly by surgical instruments, such as elevators. The nerve may also become transected by rotary instruments or during extraction of a tooth whose roots are notched or perforated by the IDN. The risk factors for IDN injury during extraction of LM3 are shown in Table I.

Preoperative radiographic investigations may include intraoral images, such as occlusal radiographs, panoramic views of the jaws, and conventional CT or CBCT scans. It should be noted that risk-predicting signs in radiographs only indicate that there is an increased risk of nerve damage associated with the extraction of the corresponding third molar. However, they cannot actually prevent the nerve injury if the tooth is to be extracted. The effective strategies that may avoid or minimise the risk of injury to the IDN can be collectively categorized into two main sets. The first is the preoperative workup, which should include critical assessment of the need to extract the third molar, clinical examination and radiographic investigation, and the second is intra-operative measures, including proper selection of the anaesthetic agent, the injection technique, mobilization of the surgical procedure and measures to reduce the degree of potential injury to the nerve.

Most literature published in the last decade has given us sufficient evidence to suggest a significant risk of damage to both the inferior dental and the lingual nerve owing to the nerve block procedure. This injury may be related to the pharmacological properties of the agent itself or the injection technique. Studies have shown that the lingual nerve is affected approximately twice as often as the IDN, and one reason for this may be the fascicular pattern in the region where the injection is given. It also appears that about half of patients feel an electric shock sensation during injection.

There is a higher incidence of reports of nerve injury after the use of articaine and prilocaine. Although the reason for this remains unknown, it has been suggested that this may be because they are 4% solutions, whereas the other commonly used local anaesthetics have lower concentrations. Others associate the damage with the neurotoxicity potential of 4% articaine and 3–4% prilocaine. Hence, it is recommended that the use of such anaesthetics be limited to local infiltration. It has been claimed that needle contact with a nerve felt by the patient as an electric shock is related to injection injury. An obvious explanation is that the possibility of mechanical injury to the nerve is more likely in the case of multiple repeated attempts at the inferior dental nerve block procedure. Therefore, it is crucial that the operator achieve optimal pain control with minimal episodes of injection with minimal doses of anaesthetic agent.

The surgery should be planned according to the information obtained from the preoperative assessment process. The procedure itself should aim to minimize the manipulation around the IDC. Both should be planned in a carefully planned access, tooth sectioning and elevation techniques. In many scenarios, the extraction of the whole tooth may carry an unavoids

**Table 1. Risk factors for IDN injury during LM3 extractions.**

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Risk of IDN Injury</th>
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<tbody>
<tr>
<td>Full bony impactions</td>
<td>High</td>
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<tr>
<td>Horizontal impactions</td>
<td>High</td>
</tr>
<tr>
<td>Use of burs for extraction</td>
<td>High</td>
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<tr>
<td>Radiographic risk markers</td>
<td>High</td>
</tr>
<tr>
<td>Clinical observation of the bundle during surgery</td>
<td>High</td>
</tr>
<tr>
<td>Excessive bleeding into the socket during surgery</td>
<td>High</td>
</tr>
<tr>
<td>Patient's age</td>
<td>High</td>
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</tbody>
</table>

**Full bony impactions:** Apices of the LM3 located inferior to the lower border of the IDC

**Horizontal impactions:** Darkening of the root

**Use of burs for extraction:** Abrupt narrowing of the root

**Radiographic risk markers:** Interruption and loss of the white line representing the IDC

**Clinical observation of the bundle during surgery:** Displacement of the IDC by the roots

**Excessive bleeding into the socket during surgery:** Abrupt narrowing of one or both of the white lines

**Patient's age:** Including sharp pain and abnormal response to stimuli, such as the perception of a light touch as a sharp stab. This can have a significant impact on quality of life for many patients.

Injury to the IDN may occur from compression of the nerve, either indirectly by forces transmitted by the root and surrounding bone during elevation or directly by surgical instruments, such as elevators. The nerve may also become transected by rotary instruments or during extraction of a tooth whose roots are notched or perforated by the IDN. The risk factors for IDN injury during extraction of LM3 are shown in Table I.

Preoperative radiographic investigations may include intraoral images, such as occlusal radiographs, panoramic views of the jaws, and conventional CT or CBCT scans. It should be noted that risk-predicting signs in radiographs only indicate that there is an increased risk of nerve damage associated with the extraction of the corresponding third molar. However, they cannot actually prevent the nerve injury if the tooth is to be extracted. The effective strategies that may avoid or minimise the risk of injury to the IDN can be collectively categorized into two main sets. The first is the preoperative workup, which should include critical assessment of the need to extract the third molar, clinical examination and radiographic investigation, and the second is intra-operative measures, including proper selection of the anaesthetic agent, the injection technique, mobilization of the surgical procedure and measures to reduce the degree of potential injury to the nerve.

Most literature published in the last decade has given us sufficient evidence to suggest a significant risk of damage to both the inferior dental and the lingual nerve owing to the nerve block procedure. This injury may be related to the pharmacological properties of the agent itself or the injection technique. Studies have shown that the lingual nerve is affected approximately twice as often as the IDN, and one reason for this may be the fascicular pattern in the region where the injection is given. It also appears that about half of patients feel an electric shock sensation during injection.

There is a higher incidence of reports of nerve injury after the use of articaine and prilocaine. Although the reason for this remains unknown, it has been suggested that this may be because they are 4% solutions, whereas the other commonly used local anaesthetics have lower concentrations. Others associate the damage with the neurotoxicity potential of 4% articaine and 3–4% prilocaine. Hence, it is recommended that the use of such anaesthetics be limited to local infiltration. It has been claimed that needle contact with a nerve felt by the patient as an electric shock is related to injection injury. An obvious explanation is that the possibility of mechanical injury to the nerve is more likely in the case of multiple repeated attempts at the inferior dental nerve block procedure. Therefore, it is crucial that the operator achieve optimal pain control with minimal episodes of injection with minimal doses of anaesthetic agent.

The surgery should be planned according to the information obtained from the preoperative assessment process. The procedure itself should aim to minimize the manipulation around the IDC. Both should be planned in a carefully planned access, tooth sectioning and elevation techniques. In many scenarios, the extraction of the whole tooth may carry an unavoids
It should be noted that both sectioning and coronectomy can be performed with a shorter incision, as the amount of bone removal required is minimal, thus minimising the postoperative morbidity. However, it cannot be performed in all cases in which the LM3 is close to the IDC and is certainly contra-indicated when the LM3 is decayed or its roots are associated with a pathology and should be considered with caution in severely inclined mesio-angular and horizontal impaction cases. The author does not recommend distal bone removal or retraction of the lingual flap with the intention of protecting the lingual nerve, as these may increase the risk of damaging the lingual nerve. It should be emphasised that incisions may not extend beyond the distobuccal aspect of the tooth.

The other important aspect of the dental extraction procedure is the future replacement of the tooth to be extracted. The current trend of tooth replacement for both functional and aesthetic reasons is the placement of dental implants. The success of this treatment largely depends on the availability of healthy bone in sufficient volume. Therefore, it is crucial for the dental practitioner not to compromise the alveolar bone during extraction of the teeth. Changes in the alveolar bone ridge after an extraction are inevitable. After all dental extractions, bone height and width always undergo dimensional changes. Bone does not regenerate above the level of the alveolar crest, that is, its height will not increase during healing. The buccal plate tends to shrink, shifting the crest of the alveolar ridge lingually, and often forms a concavity. Such changes are proportional to the amount of trauma to the soft and hard tissue during the extraction.

An additional unfavourable change that may take place is the slow remodelling of the bone formed to fill up the extraction socket owing to lack of functional stimulation. The presence of poorly remodelled alveolar bone may compromise the stability and function of the future implant. Furthermore, studies show that the stripping and elevation of mucoperiosteal tissue produce a higher number of osteoclasts within the alveolar ridge and hence greater resorption and shrinkage are seen after the classic surgical or traumatic extraction of teeth.

The preservation of alveolar bone for future implant placement may be achieved by avoiding unnecessary bone removal and stripping of the periosteum during surgery, as well as performing a surgical alveolar bone preservation procedure. Bone removal can be largely avoided or minimised through modification of the traditional extraction technique. The first such modification is the use of dental periotomes and luxatomes to gently strip the periodontal ligament fibres and widen the socket without causing cracks or fracture of the cortical plates, as commonly encountered when using dental forceps or the bulky elevators. The use of such gentle instruments also eliminates the need for elevation of mucoperiosteal tissue. However, it should be noted that the safe use of these instruments requires adequate training and should be encouraged during undergraduate clinics. Clot stabilisation through light packing of the socket with collagen sponges may help to minimise clot dislodgment, as well as accelerate the healing process and bone regeneration.

The second strategy is the alveolar bone preservation procedure. This includes packing the extraction socket with different fillers, such as osteoinductive or osteoconductive materials, like autogenous, natural or synthetic bone grafting materials that support the alveolar socket walls, thus preventing their collapse and shrinkage. It should be noted that this intervention can only slow down the post-extraction changes to improve the success of the dental implant, but cannot stop them altogether.

Finally, post-extraction care should include an explanation of the healing process and potential symptoms encountered after such procedures. The prescription of medications should be limited to non-steroidal anti-inflammatory drugs in most cases and imprudent use of antibiotics or socket dressing should be avoided.
“Patients tend to go to court more often nowadays”

An interview with Dr Andy Wolff, Israel

Be it a careless error or a case of misjudgement, even the most experienced practitioner can make a mistake. In fact, statistics indicate that it is likely that every general dentist will be involved in a malpractice suit at some point in his or her career. Israeli based dentist Dr Andy Wolff has worked as a medical expert in dental malpractice litigation for many years and has seen almost everything, ranging from slight negligence to severe overtreatment, today had the opportunity to speak with him recently about the steady increase in litigation in the field and simple measures that can help prevent many malpractice incidents in the first place.

today: Dr Wolff, you have been a medical expert in dental malpractice litigation for many years now. Why is it so important to increase awareness of this topic?

Dr Andy Wolff: So much literature out there tells dentists how to do their job. It does not tell them how to prevent malpractice incidents or improve efficacy with the newest technology—but there are no books on how not to do things or, more precisely, what can happen when something has gone wrong. This aspect is no less important, both for the patient affected and for the clinician, who might be facing legal consequences.

Many may think that it is not relevant to them, but every smart physician knows that things occasionally go wrong and no one is immune. By documenting dental malpractice incidents and by talking and writing about these, I aim to raise awareness and therefore help prevent future incidents.

In your experience, what types of malpractice are most common?

There are definitely many cases in the neurological field. As a medical expert, I am confronted with many instances of damaged nerves caused while placing an implant, during tooth extractions or through an injection. It is common and it happens quickly. Typically, it is an inadvertent mistake, because the clinician was either in hurry or impatient. However, the consequences for the patient are mostly very dramatic and often beyond reparation.

Aside from nerve damage, is there an area where mistakes are more likely?

If I had to choose one, I would say it is implants. I recently had a very disconcerting case where an oral surgeon did all the preliminary examinations, everything. For that reason, the CT scan, the radiographs, everything. For that reason, he knew for certain that he was working with a bone structure of 11 mm, yet he used an implant that was 15 mm long in the treatment. Maybe he was just mistaken or the assistant handed him the wrong implant and he did not recheck it, but the result was that he hit a nerve.

In this particular case, the dentist was a specialist, an experienced surgeon. Without raising the question of guilt—although the surgeon was without a doubt responsible for the damage—cases like this show that mistakes really can happen to anybody.

With the consequence that patients partially lose sensation in the mouth or face.

Yes. Another consequential damage of which I only recently learnt, is loss of sense of smell. Patients whose sinus has been injured often lose their ability to smell. Sometimes, they may not even realise it initially, because the sinus runs in a border of the brain and the unaffected side often functions normally. Imagine losing your sense of smell completely owing to a defective bilateral sinus lift procedure—that would be a fairly serious impairment of a person’s quality of life.

Have malpractice incidents become more common over the last decades?

I would say so. At least, litigation has increased. Of course, there have always been cases of malpractice, but patients tend to go to court more often nowadays. Perhaps you could call it an “Americanisation” phenomenon: almost every problem is taken to court, with the result that dentists are paying increasingly higher insurance fees because the treatment risks are so high today.

How common is legal action in dentistry and what is the compensation amount paid compared with other medical disciplines?

I certainly see many cases in which dentists have carried out a treatment for which they were not qualified. I remember an incident in which a general practitioner injured nerves on both sides of the mouth during an implant treatment. That is truly unbelievable. I have seen many cases over the years, but nothing quite like that.

In another case, a dentist extracted a third molar without the requisite training. He should have referred the patient to a specialist, but he chose to do it himself—possibly because it earned him another US$ 200–300 (£ 130–190)—with the result that the patient now has to live with chronic pain for the rest of her life.

Can injured nerves regain normal function eventually?

Mostly, damage is irreversible. There are exceptions, of course, either if the damage was not too severe or if the nerve was inside a canal. Potentially, an injured nerve can regain function over time. However, if it is an exposed nerve, such as the lingual nerve, the damage is generally irreversible, although there are some microsurgery procedures that may improve the situation. Interventions like this, however, carry extremely high risks themselves and might even aggravate the situation.

It is perhaps comparable to plastic surgery. There are many claims filed for cases in which the result was not what the patient expected it to be. Compensation payments range from US$ 10,000 to 100,000, which is much lower than those in other medical disciplines.

Do more cases of overtreatment or cases of error on behalf of the dentist end up in court?

These cases have an almost equal occurrence. Of course, overtreatment leaves the dentist in a bad position. It raises the question of why he or she treated the patient as he did. In the first place and did so poorly in the second; it leaves him or her doubly guilty. However, a reasonable treatment plan had been formulated, it is comparatively less bad. Sometimes, even if a patient dies while undergoing therapy, this does not need to involve a distinct fault of the clinician.

An American dentist was recently charged because his patient died after he extracted 20 teeth in one procedure. He said that he had done the extensive treatment in the past; it depends on the need for the treatment and how it is done. Probably, that case in the US was the result of a combination of many things. For instance, did the dentist act in accordance with state of the art practice? If not, he is at fault. If he did, one has to remember that dentists cannot rise above today’s level of knowledge and technology. Let us say an impaired patient files charges for something that happened to him 20 years ago that would have been preventable with the latest medical treatment. He can, of course, make a claim, but the15 dentist could not be sued for it if he or she treated the patient according to the best knowledge available at that time.

That is a very important aspect when writing expert reports on dental malpractice: did the dentist act to the best of his or her ability and according to the current knowledge or with gross negligence? That is what makes the difference.

What can medical professionals do to protect themselves against legal disputes arising from high risk procedures they intend to perform?

Patients should not only be warned of the possible consequences of a certain procedure, but also be advised of the alternatives—and one of those alternatives is not proceeding with treatment at all. In my opinion, the patient should always understand both options: the risks of a particular treatment and what could happen if nothing is done. Only then should he be asked to sign a declaration of consent.

Unfortunately, the reality is often quite different. Patients are often asked to sign declarations of consent on their way into surgery or while already on the dental chair. Even if they had questions then, there would be no time to answer them properly. Although it should be of major concern for every dentist to perform the patient’s risks, as well as alternative treatment methods, before he or she is asked to sign a consent form, I am constantly confronted with the opposite.

So, you are saying that consultation should be of similar importance to treatment?

Absolutely. In my opinion, building mutual trust between doctor and patient is key for avoiding malpractice claims and consequential charges. If patients feel that their condition is being properly treated, and that money is not the dentist’s first concern, this alone can prevent litigation in many cases. Of
course, if a nerve is damaged, there needs to be a settlement of some kind, but if a bridge fails, for example, instead of filing charges the patient will return for further treatment if there is a solid, trust-based relationship.

Time, communication, trust—what else is important when it comes to preventing malpractice?

One more basic rule every dentist should follow is adhering to evidence-based dentistry. This means not performing a certain treatment just because in the dentist’s experience it is considered to be right. External scientific evidence should be implemented. Also, every single finding should be taken into account in determining how to treat the individual patient: diagnosis, radiographs, periodontal analyses, age, health status, literature, and so on. Neglecting these related aspects can very likely lead to misconduct.

Do you see basic problems in dentistry that need to change?

Nowadays, we face the problem of “cheap” dentistry. Owing to the amount of competition with the large number of dentists in the market, there are many cases of overtreatment. Cheap dentistry needs to be fast, yet I have documented cases in which patients have returned for retreatment of a simple problem up to 70 times in two years. If you add up the time those patients invest only to have a poor outcome, it is striking. However, it is not possible for there to be elite dental practices solely. For legal purposes, dental treatment does not need to be exquisite, but it has to be reasonable.

Maybe it is a problem of today that patients have increasing expectations regarding the service or technologies their dentist should be using. That is certainly part of the same problem. Advertising that promises people a new Hollywood smile in 2 hours forms the basis of patients’ beliefs or expectations regarding treatment. Dentists should not be tempted to involve themselves in this kind of misguided pressure. Honest communication is key when aiming to avoid disappointing patients.

Measures to prevent malpractice should begin as early as possible, but where should prevention start?

Personally, I think legal regulation should be extended, such as specific laws or by-laws concerning the amount of experience and training, for example, required in order to perform certain procedures. Basically, it is just what common sense calls for and everybody will agree with if they think about it: should one be allowed to place an implant after attending a speakers’ corner talk or looking over a colleague’s shoulder? No, yet this is often what happens.

A second measure could focus on undergraduate education. Dental schools should devote more time to prevention of lawsuits. This aspect is neglected in the curriculum, although it is an essential part of dentistry. General awareness of the subject needs to be raised and this alone would help prevent mistakes. As I said earlier, mistakes are not always avoidable, but they should at least not arise out of negligence, hubris or greed. Apart from that, there will always be cases of medical malpractice. Dentists are humans too; only he who does nothing makes no mistakes at all.

Thank you very much for the interview.}

Bilateral mental and labial paraesthesia in a 62-year-old female patient due to bilateral mandibular canal perforation. (© Dr Andy Wolff)