Helps MAINTAIN GOOD ORAL HYGIENE, PREVENT and REDUCE PLAQUE FORMATION(1)

Helps PREVENT THE ONSET AND AGGRAVATION OF GUM PROBLEMS(2)

REDUCTION OF THE GINGIVAL INDEX(3)
-33.9%

Gums are HEALTHIER, LESS RED and LESS IRRITATED(4)

Helps MAINTAIN GOOD ORAL HYGIENE, PREVENT and REDUCE PLAQUE FORMATION(1)

2 COMPOUNDS for a mouthwash that is Disinfecting Chlorhexidine 0.10% & Soothing Chlorobutanol 0.50%

- Clinical study conducted on 42 people who used Eludril Classic mouthwash twice a day (morning and evening) after brushing for 14 days. %Savings of gingival index. (2) Randomised, controlled clinical study of the use of 0.1% chlorhexidine mouthwash by chronic periodontitis patients. JOURNAL OF INVESTIGATIVE AND CLINICAL DENTISTRY 2010;1:29-37. (3) Clinical study conducted on 28 people who used Eludril Classic mouthwash twice a day (morning and evening) after brushing for 14 days. Modified Gingival Index of Löe and Silness. (4) Clinical study conducted on 28 people who used Eludril Classic mouthwash twice a day (morning and evening) after brushing for 14 days. Evaluation of cosmetic acceptability after 14 days of use. Percentage of satisfaction.
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Published by On behalf of Member of
It is a privilege to write to you from the editor's desk of the OHASA Journal. The occasion is filled with trepidation, anxiety, panic, but also excitement and an eagerness to learn and to serve the OHASA community.

At the outset, I wish to pay tribute to the outgoing editor, Natasha Swart, for her sterling work. Under her leadership, our journal flourished. The journal reached new heights of information and empowerment. Natasha, on behalf of all at OHASA, I extend a collective, heartfelt gratitude for your invaluable contribution and we wish you all the best and the most wonderful time with your precious children.

And so Quo Vadis OHASA Journal? It will be a mistake to change the winning recipe of those who have come before me. They have provided me with an excellent foundation upon which to build. However, even if we are sitting on the right track, we need to keep on moving, or we will be left behind in the academic milieu. Allow me to share my vision for the Journal. It is my fervent intention to make OHASAJ our collective own!

The OHASAJ, as the mouthpiece of our organisation, should reflect current practice, research, evidence and scientific advancement of our profession. The profession can determine the direction that OHASAJ takes and the content thereof. This we can do by actively contributing to the journal.

Firstly, if the journal is to be the mouthpiece of our profession, we need to see South African research reflected in it. We have been most fortunate to have hosted numerous excellent articles in our journal. These have been well received by our readership, but too many of these articles are past publications that are borrowed or paid for. The dearth of articles from our own professional community has been glaringly apparent. Where are the voices of our fellow hygienists and indeed of the oral health profession? Here I include dentists, dental therapists and dental assistants and those of our colleagues who find themselves in the realm of academia.

Secondly, it is our intention to make the journal more relevant to the lives of oral hygienists and those who are involved in oral health. We want to engage, among others, oral hygienists in private practice, Department of Health oral hygienists, independent practitioners, and oral hygiene students, recent and past graduates. We want to hear of their expectations, their aspiration and their fears. This edition of the journal features Emma Coulter. We intend doing such features on a regular basis. We need your input by sharing your thoughts with us.

Thirdly, we wish to seek and accomplish full accreditation for our journal. Such accreditation will be invaluable for the credibility of our journal. It would add immensely to the status of our journal. Contributors will more readily write for a journal that is accredited. Above all, accreditation will result in added respect for our profession. An accredited mouthpiece will greatly enhance our reputation as oral health professionals.

Fourthly, we intend for the journal to reflect the latest news around events, seminars, launches, CPD points, legislation pertaining to our profession and all other activities relating to our profession. We shall realise these intentions only when our friends and colleagues submit their own articles for publication. This is YOUR platform, YOUR voice. While we can all benefit from researched academic contributions, articles that depict everyday clinical experiences from our colleagues will be most welcomed.

From the plush surgeries in Sandton to the dusty clinics in the rural areas, from the mundane experiences to the extraordinary – all of these will find place in OUR journal.

I urge you to not be a passive recipient of information, but rather to be a contributor to the transformation of our profession – transformation that will lead to personal and professional growth. We have a vital role to play in the oral health of our country. If we want our profession to be valued within the dental and general health fraternity, we need to make our collective voices heard. OHASAJ is one such platform for your voice to be heard. May it echo across the length and breadth of our beautiful country. Bring on 2016, and beyond...
FROM THE PRESIDENT’S DESK

Dear OHASA Members and Colleagues

Welcome to 2016 – wishing you all a prosperous and blessed new year.

I would like to welcome Rugshana as the new editor of the OHASAJ, taking on editorial responsibilities for a journal for the first time can be a daunting prospect. As the journal editor Rugshana will play a vital role in the academic publishing process. I would like to take this opportunity to thank Rugshana for taking on this role and for the effort that she has already put into the first edition, I hope that you will enjoy your new role.

The new DTO Board (the professional Board for Dental Therapy and Oral Hygiene) has had preliminary meetings and will have its first full meeting in April, we wish the members success in their new positions. The landscape of our group has changed tremendously over the past decade and it is important that the Board members do not become so spooked by the demands of the job that they are deterred from taking on a governance role. This would be cheating them of an immensely rewarding experience, a source of great pride and personal satisfaction, a feeling of giving back to our profession, of working for a cause and doing something for no financial reward but because it is worthwhile. Such rewards can be hard to come by in other aspects of life.

SADA 2016 will take place from 19 to 21 March 2016 at Gallagher Estate in Johannesburg with the oral hygiene programme on the Sunday giving all members countrywide an opportunity to attend as the Monday is a public holiday. Registration can be done via the SADA website, www.sada.co.za, under the Congress 2016 tab.

OHASA fees for 2016 are due on 29 February 2016 and application forms can be found on the OHASA website (www.ohasa.co.za) under the online Registration forms tab.

HPCSA news: Dental Assistants who are not registered should register to avoid steps being taken against their employers. The HPCSA has also arranged for off-site registrations/renewals in the different provinces from 1 March to 13 May 2016; these dates will be placed on the OHASA website under General News. There will be facilities for debit and credit cards. The aim is that your registration/renewal is done timeously and that you receive your practising cards. To view the dates on the HPCSA website, go to www.hpcsa.co.za under the registrations tab.

The fees for 2016/17 are:
- Oral Hygienist: R1 737.00
- Dental Therapist: R1 737.00
- Dental Assistant: R723.00
- Student Dental Assistant: R723.00
- Dentist: R1 593.00

Practitioners who wish to take voluntary erasure should do so well in advance and have their acknowledgements from the HPCSA before 31 March 2016; remember to safeguard the documents and correspondence.

Dental Protection Insurance is available through SADA and you do not have to be a SADA member to obtain the DPL – DPL is mandatory for the Independent Practitioner.

Thank you to the team at Medical Practice Consulting for their efforts with our website and addressing the problems that our members encounter; OHASA wishes all of you a wonderful 2016.

Finally to our Dental Traders, the faithful traders and all the new traders of 2015/16 – THANK YOU.

Thank you for all your generous sponsorships – we would not be able to afford all our members the benefits without your input and sponsorships. Wishing you a fantastic and prosperous 2016.

“Be truthful and honest at all times
Take full responsibility for your actions.”

God Bless

Stella

Stella Lamprecht
OHASA president

OHASA is a dedicated, dynamic, professional association representing hygienists as invaluable members of the health profession team.

OHASA aims to promote quality oral healthcare by representing, protecting and advancing the profession in partnership with stakeholders.

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South Africa is a unique and amazing country – we have diverse cultures with many races, opinions and people. But one thing that affects us all, rich or poor, is periodontal disease.

Let’s look at the figures: South Africa has an estimated population of 53.8 million (2013). There are 1,006 registered oral hygienists and about 5,800 registered dentists. About two-thirds (or 35 million) of South Africans have some form of periodontal disease. This makes the ratio of oral hygienist to diseased patients about 1:35,000. If all patients affected by periodontal disease go for treatment, all of our oral hygienists would be booked up years in advance and have their hands full with perio patients alone, not to mention other treatment categories.

Unfortunately the reality is a different story. The reason being that we approach patient care in from the wrong angle in the dentistry sector.

Let’s start at the very beginning. Oral hygiene is the cornerstone of oral healthcare, and should be the foundation of the Oral Care Pyramid (illustrated below). Resources, such as time and money, should be spent accordingly.

You might find this hard to believe, but in reality we unfortunately the reality is a different story. The
reason being that we approach patient care in from the wrong angle in the dentistry sector.

Let’s go back to basics. The periodontium is the mother, the host and keeper, of every tooth in our mouths. Neglect of this life-giving and sustaining ‘organ’, (through lack of knowledge among patients and providers) is the largest reason for tooth loss in South Africa and worldwide.

I was at an implant lecture a few years ago where the delegates were asked to sketch the difference between the periodontium of a healthy tooth and that of an implant. I was shocked to see that most dentists (including myself) were hesitant to put pen to paper as we were not sure what a healthy periodontium looked like.

The dentists I am talking about are highly skilled leaders in the field of dentistry and mentors and practitioners on a very advanced level. None of them could, with confidence, sketch what a healthy periodontium should look like.

Why am I telling you this and what am I trying to say?
Firstly – How do we expect a layman to know what a healthy periodontium is when we as providers do not know? Secondly – How do we expect them to know how vital a healthy periodontium is to general health, when they are given multiple treatments, while the most important area of the mouth is overlooked?

The issue of neglected periodontal health and subsequent tooth loss is a double-sided coin. On the one hand we have uninformed patients, and on the other hand we have providers creating Hollywood smiles in failing periodontiums.

The issue of neglected periodontal health and subsequent tooth loss is a double-sided coin. On the one hand we have uninformed patients, and on the other hand we have providers creating Hollywood smiles in failing periodontiums.

Dentists and oral hygienists are not charity workers, and with the tumbling Rand, making a good living has become more and more challenging. Unfortunately, in our attempt to survive, we often provide a service based on the best financial returns. In some cases, decisions have to be based on what funds patients have available or what medical aids are prepared to pay.

So who should be responsible for educating, treating and being the custodians of the periodontium?

What I am hoping is that the oral hygienist will take responsibility. It is time for a paradigm shift in oral hygiene in South Africa. It is time for the oral hygienist to recognise how extremely important he/she is in disease prevention. It is time for the oral hygienist to view themselves as an independent practitioner who can take control of their profession by diagnosing, educating and treating patients independent from a referring dentist. Why can’t we have ‘mini Periodontists’ instead of ‘cleaning ladies’ or ‘glorified assistants’. Why are there so few registered and independently practising oral hygienists?

I believe that oral hygienists have an invaluable role to play in the education of both patient and dentist, and the process has to start right here and right now.

Tools of the Trade

There are numerous tools available to us when educating and diagnosing periodontal disease. Unfortunately, we rarely use them, and stay busy in our path-dependant ways of drilling, filling, managing patients’ medical aid benefits and surviving to the end of every day. That in itself is the reason why a lot of patients’ oral health needs are not always fully met.

Here follows a list of the useful tools that can be implemented when treating periodontal patients.

Radiographs

Digital radiography is a must in every oral hygienist’s surgery. We need to use it for the diagnosis of
periodontal problems on a daily basis. Very few oral hygienists have digital radiography in their surgery, let alone take x-rays on a daily basis. I really do not see the reason for this? It’s easy to do and falls in your scope of practice. It should be a no-brainer to have digital x-rays in your surgery as it is a win-win for both patient and oral hygienist.

Probing

We should all be using some form of periodontal probe on a daily basis. It is as simple as:

1. Probe the pocket
2. Chart on the file or computer
3. Tell the patient they might have a periodontal disease.

Remember, that patients have no idea what you talking about; all that they are aware of is the next painful probe in his/her gum.

Without proper communication, diagnosis is useless. I cannot stress this enough. You can be the best hygienist in the world, but if your patient does not fully grasp the extent of the disease process in their mouth, they are unlikely to come back for further treatment, or take ownership of their oral condition.

This is why the Florida Probe is such a valuable tool. The Florida Probe is not just a probe that is made in Florida. It is a computerised probe with a footswitch that works with perio software to create a mini ‘probing station’. The probe has a talking computer that is easy to understand by both the operator and patient. The voice callouts inform patients of pocket depth, bleeding and also puss on probing. It also says “warning” and “danger” on all the deeper pockets, while charting the pockets at the same time.

What this does is not just talk to you, but also to the patient. The funny thing is that the patient will always believe the computer and not you. It also gives you a printed diagnosis with all the detail for the patient to take home.

The Florida Probe is a very thorough tool, and you will need to take time and learn to use it. But I highly recommend this tool if you are serious about treating and educating periodontal disease.

Taking cytological smears

Testing for Immunoglobulin type and the type of bacteria involved with a specific patient has been made easy by Hain Lifescience and I think we all should be testing our periodontal risk patients on a daily basis. For more information, please contact Hain Lifescience.

Multimedia

Digital cameras, TVs, the internet, YouTube, i-Pads and cellphones are tools we all use daily. But very few of us are using it to educate our patients. Patients do not know what is happening in their mouths. They are not aware of the difference between a healthy mouth, gingivitis or periodontitis. All they know is that their gums bleed when they floss and that is why they stopped flossing. We need to use videos and pictures to educate our patients on the basics of periodontal disease. Put a big screen in your room and use multimedia to show people what is happening in their mouths.

The new term, ‘periodontal medicine’, refers to the perspective that oral disease and systemic health is interrelated in important ways. Whether it is the cause or effect does not really matter, what matters is that we get involved in treating patients with systemic diseases at an early stage. We should be involved with all cardiac and diabetic centres. We cannot wait for them to get to us, we need to educate them before periodontal breakdown.

If diagnosis and education is done properly, patients will understand their condition, will be more motivated to get treatment and will be more willing to pay for treatment out of their own pocket.

Treating periodontal disease is hard work and a selfless job. There are thousands of patients out there who need to be informed and educated. These patients should be reached early on to retain their oral and general health, else they might lose their teeth and quality of life.

In return you will be rewarded not only financially, but also with the peace of mind that you are giving a patient the best treatment possible. Patients might not walk out there with a new Hollywood smile, but you can offer them way more than that. You can offer them healthy teeth and improved general health.

Let’s start thinking outside of the box and reinvent ourselves as clinicians to give our patients the treatment they need and deserve. Happy probing!

Note: This is not a scientific paper. It is an opinion of a dentist in a private practice.

SAVE A LIFE: REACHING OUT TO THOSE IN NEED

On 13 February 2016, Lizette Luyt and a group of ladies from church opened their doors and hearts to the homeless and needy of the Westcliff (Chatsworth) area in KwaZulu-Natal. But... with one difference: For the first time they also offered basic healthcare and advice to the homeless, needy and anyone who needed it.

About 150 people got a meal and about 100 people received basic healthcare, which included the checking of their blood pressure, wound checks, hypertensive and diabetic advice and general health advice.

"Some of them were hypertensives but due to non-compliance to medication were hypertensive on the day, some had skin conditions and cellulitis and some had blood sugar level concerns," Lizette says.

"It was great to do something as small as just talking to someone who may not be able to ask anyone else for advice or to raise concerns!"

APPEAL

Lizette concludes, "On 12 March 2016 we do it all again and would love to get other healthcare professionals to join us. If anyone would like to join us or would like more information, please feel free to email me or call me for more details."
ABSTRACT
SADA has lost its case in the contest for the regulation of dental assistants in the High Court and the Supreme Court of Appeal. If the awards of costs to the respondents are any indication to go by, this loss is not without significance. In this article our aim is to infer from the judgments in an effort to add some understanding and meaning to interpretation and comprehension. The premise for our perspective holds SADA to be the prime mover of its destiny.

The judgment by the Supreme Court of Appeal delivered at the end of 2015 has settled the dispute between the South African Dental Association (SADA) and a number of respondents – at least for now. The ways, means and ends of the dental association are often perplexing, which can leave its contemplations, and even its resolutions, open to more than one interpretation. In its judgment the court cited confused thinking on the part of SADA.

The case before the courts in SADA v. the Minister of Health1 has evidence of misery on more than one side. On the side of SADA, the appellant in the case, self-imposed misery stems from an action in the main driven by the way it has always been done – a traditional social action, as opposed to one based on instrumental rationality (zieckrational), or value-rationality (wertrational), or even one that is somewhat emotional. The other side, represented by the Dental Assistants Association of South Africa (DAASA), is on the receiving end of the imposition caused by SADA. As the fourth respondent in the case DAASA had to suffer the humiliation of SADA’s paternalism when the latter judged it as unfit to be heard in court. The first, second and third respondents, namely, the minister (Minister of Health), the council (HPCSA), and the chairperson of the board (Professional Board of Dental Therapy and Oral Hygiene) seem to be little more than supporting actors in a drama of a means to an end.

FACTS OF THE CASE
The job of dental assisting is regulated by the HPCSA. One needs to be registered with the HPCSA in order to legally practice the job of dental assisting in any sector of the South African economy. SADA wanted this decision to be set aside.

The case in the court of first instance (court a quo)2 was prompted by the publication of government notices in regard to the qualifications for registration of dental assistants3,4, their scope of practice5, student dental assistants6,7, and the constitution of a professional board8. In its founding affidavit – the foundation of its case – SADA cited the Health Professions Act (HPA)9, the Promotion of Administrative Justice Act (PAJA)10, and the Constitution11 in support of its application for judicial review. In essence, its case was one of illegal action by the minister in regulating the job of dental assisting. The application was dismissed with costs by the High Court of South Africa and leave was granted for an appeal to the Supreme Court of Appeal in Bloemfontein. In its judgment, the court recommended for the minister to continue with his regulations in the improvement of the legislation regarding dental assistants. This, however, should be in conjunction with a two-year moratorium period, ending on 6 March 2016, before failure to register would be met with criminal sanction.

On the 24th of November 2015 the appeal was dismissed with costs, including the costs of the two counsels employed by each of the four respondents. In terms of the law of the land the job of dental assisting is officially a regulated profession. It is what it is.

LEGAL FRAMEWORK
SADA construed three legalities in support of its arguments to wipe the regulation of dental assistants from the statute. The first one is PAJA.12 The constitutional right to administration that is lawful, reasonable and procedurally fair was given effect to with the passing of PAJA in 2000. The Act provides for judicial review as a means of achieving administrative justice. This means that anyone (or any organisation or association) who is not happy with a decision can challenge the decision in court. The decision however, must be an administrative action and must be challenged within a time limit of 180 days after internal remedies have been exhausted. Although Section 7(1) of PAJA states the definite time limit of 180 days, Section 9(1) of the Act allows for the granting of condonation in appropriate circumstances where proceedings are instituted once the 180-day period has lapsed. When de-coded, condonation is forgiveness of an offence by ignoring it, although in terms of PAJA, in the presence of valid and acceptable reasons.

The second one is Section 33 of the Constitution13 by itself. As the impetus for PAJA, Section 33 embraces the concept of administrative justice to ensure good governance and administration. In contrast with the previous regime of parliamentary sovereignty, administrative justice as a construct is about fairness in administrative dealings, protection against the abuse of state power, public participation in decision-making, and the notion that public officials are answerable and accountable to the public.14 In here somewhere is the principle of legality which, as part of the doctrine of the rule of law, requires for all public power to be exercised in terms of a constitutional principle of legality. The principle applies to all exercises of public power and provides for an essential safeguard when actions do not qualify as administrative action for the purposes of PAJA or the Constitution.15 In layman’s terms and sufficient for our purpose, the exercise of power should happen within the borders of a policy and not arbitrarily, i.e. the exercise of power should be lawful.

The third one is the HPA16 which provides for a statutory body – the Health Professions Council of South Africa – and for control over the education, training and registration for, and practising of, health professions registered with the HPCSA. In terms of the Act, a health profession means any profession for which a professional board has been established, and includes any category or group of persons provided for by such a board and does not necessarily refer to an occupation that requires specialised education, knowledge, training and ethics. Implementation of this Act requires regulations that intend to ensure protection from unscrupulous, incompetent and unethical practitioners. It offers some assurance to the public that the regulated individual is competent to provide a particular service in a safe and effective manner, and it provides some means by which individuals can be disciplined when they failed to comply with acceptable standards.

FOUNDING ARGUMENTS
In support of its application for a judicial review of certain decisions taken and administrative action performed by the minister, SADA based its arguments on the principle of legality by stating all the regulations promulgated to be against ultra vires the provisions of the HPA. In its view, the HPA contains no empowering provisions for the minister to promulgate regulations with regard to the regulation of the job of dental assisting. The court of first instance disagreed. SADA should have brought its application in terms of PAJA, and in doing so, ought to have applied for condonation. The failure of SADA to do so was fatal to its case.

SADA was way out of time (by several years) in bringing an application for judicial review. It could not afford to ground its arguments on PAJA because of the 180-day period limit. It could not apply for condonation because it lacked plausible reasons in doing so. Except for the regulation on the scope of
practice, all the others were beyond review without condonation. SADA tried to circumvent the time limit by reverting to the principle of legality. In doing so, it required additional argumentation in support of its circumvention for which it provides for when averred that the principle of legality is without time limit, and that a party always has a right to proceed against questionable legislation on the grounds of the principle of legality and, therefore, cannot be restricted to PAJA. The first error on its side was that as a general rule, questionable or impugned administrative action remains, in fact, valid and has legal consequences until such time that it is set aside by a court. Its second error was the belief that the difference between PAJA and the principle of legality is a matter of choice. It was common cause between the parties that the making of regulations by a minister constitutes administrative action, and therefore by the arguments of the minister and DAASA, the dental association, should have brought its application in terms of the provisions of PAJA. Further advance of arguments depicted the failure of SADA to apply for condonation despite raising the aspect in response. Counter arguments clearly implied no choice in bringing the principle of legality for review where PAJA applies. The review of administrative action no longer flows from the common law but from PAJA and the Constitution itself.

SADA submitted in its argument that the minister was not entitled to promulgate regulations in the absence of a register for dental assistants. It argued that the register had to be created in order for the profession to be created. There was no need to create a profession for dental assistants as for decades they worked under the supervision of dentists. Although a register must be opened as a first step, there is no provision in the HPA that empowers the minister to open a register. The minister therefore although a register must be opened as a first step, they worked under the supervision of dentists. A profession for dental assistants as for decades was not entitled to promulgate regulations in the terms of the HPa, is precluded from creating a profession by setting minister to open a register. The minister therefore

Apart from challenging the regulations and the powers of the minister, SADA averred that years of its representations were not taken into account by the minister. This submission attracted harsh words from the court when disagreement was stated for the non-notice in SADA’s founding affidavit of the involvement of its chief executive officer and president in the task team that debated and supported these matters. To suggest that SADA’s views were not considered is dishonest. SADA’s astounding response was to deny its active involvement in any task team and further stated that neither the chief executive officer of SADA nor the vice president of SADA served as representatives of SADA or acted on its behalf. Who then speaks for SADA?

Over the years many representations were made by SADA to the minister, the health department, and the council. In nearly all of them SADA first of all stated its disappointment in not been recognised as the centre of attention. SADA participated actively in commenting on the proposed regulation regime for dental assistants. It supported in principle the establishment of a register for dental assistants and recorded its concern that there may not be sufficient training institutions to train the numbers required. Throughout, SADA fluctuated between support for and objection to the official regulation of the job of dental assisting without at any point making its true stance clear. Unlike the point of view of DAASA who remained crystal clear from the beginning to the end. The fluctuation became the driving force that resulted in contradictions and statements sometimes too difficult to comprehend. For example, when SADA stated that there will be consequences for the vicarious liability of dentists (a secondary liability that arises under the common law principle of agency – respondend superior [let the master answer]) when dental assistants are liable to patients in their own right.

**CONCLUSION**

Significant is the minority judgment by Willis NP when the honourable Judge of Appeal feels the moralistic reprimand addressed to SADA in the majority judgment, to be unfair. It needs to be clear that SADA has failed because the law is against it and not because judges are, the judge proclaimed. Not unreasonable, however, is the unvoiced question accentuated by the minority judgment: Where’s the ethics in the dispute between SADA and DAASA?

What DAASA wanted was for the regulations to be upheld, or for the worse, to be referred back to the minister for whatever was required in rendering them valid. In a conditional counter-claim the dental assistants association wanted for the minister to be allowed to proceed in taking the necessary steps to cure the defects so that dental assistants may be regulated in a lawful manner. DAASA devoted much of its time and effort over a long period of time for the regulation of the job of dental assisting. In advancing the interests of dental assistants, it has advocated for the statutory recognition and regulation of the work of dental assistants for more than two decades. Through this, in its view, dental assistants would be protected in the workplace and resultant quality minimum training would ensure the best possible service to the public. For many years DAASA made it clear that what it wants is for dental assistants to be registered with a statutory body like all the other members of the dental profession.

What SADA wanted was for the regulations to be set aside. Despite its pretension of being in agreement with the regulation of the job of dental assisting in which it pacified DAASA all along, its actual intent was to prevent this from happening at all costs – or for the worse, to allow for regulation on its terms and on its terms alone. SADA submitted that for many years dental assistants were trained while working under the supervision of dentists. This arrangement had served the dental profession well, and in its view, there is insufficient evidence to suggest that unregistered dental assistants have in any way prejudiced the interests of patients, therefore, change is inevitable.

The lot has been cast, and based on the available evidence, fair and square from our perspective.

**REFERENCES**

5. Ibid Notice 793. GG No. 27968, 12 August 2005, 482(8289).
8. Ibid Notice 120. GG No. 35045, 14 February 2012, 560(9684).
ABSTRACT

An investigation of the intentions and knowledge of entrepreneurship of final-year university dentistry students is reported, with particular regard to the factors of gender and race. A questionnaire survey was used with final-year dentistry students, over two years, at the University of the Western Cape in South Africa. The findings show that dentistry students across race and gender groups believed that entrepreneurship education was important. At least half of the students showed an interest in starting a business practice soon after their graduation and completion of a mandatory one-year internship, with more male students indicating an interest in starting a business than female students.

More Black African students indicated interest compared to other race groups (Coloureds, Whites and Indians). There were no significant differences between male and female students with regard to knowledge of entrepreneurship, but there were significant differences with regard to race in the scores for knowledge of entrepreneurship, with White students scoring the highest and African students the lowest. The authors conclude that entrepreneurship education should be included in the curriculum in the final year of dentistry studies to encourage business practice start-up soon after the one-year internship period, with the aim of contributing to growth in employment.

Keywords: entrepreneurship education; entrepreneurship intention; race; gender; dentistry students; South Africa

ENTREPRENEURIAL KNOWLEDGE AND ASPIRATIONS OF DENTISTRY STUDENTS IN SOUTH AFRICA

THE INFLUENCES OF GENDER AND RACE

Pradeep Brijlal and Priscilla Brijlal (Acknowledgement: This article first appeared in Industry and Higher Education, Vol. 27, No. 5, copyright 2013.) Copyright © 2013 IP Publishing Ltd. Reproduced by permission.

Entrepreneurship is now a mainstream topic in many countries around the world. It provides individuals with career options and has the potential to help societies to become self-sustaining (Scott, 2003). In South Africa the small business sector accounts for a significant proportion of economic activity. In general, higher education institutions (HEIs) in South Africa provide courses and qualifications which serve the needs of industry well, in that they educate students to become employees, typically in large businesses, rather than to consider the creative or innovative opportunities related to setting up their own businesses and becoming employers themselves. As a result, HEIs in South Africa are now increasingly obliged to redefine their role in the national economy, with instilling a greater entrepreneurial awareness and desire in the students now regarded as their primary function. It has been argued elsewhere that HEIs should also strive to consider local development needs carefully and support the promotion of entrepreneurial education initiatives (Nicolaides, 2011).

It is recognised that a career as an entrepreneur offers significant opportunities for individuals to achieve financial independence, and entrepreneurship has been recognised as an important element in the dynamics of all economies. Entrepreneurship education has itself become an important academic research field, and entrepreneurship has been encouraged as a means of revitalising stagnated economies, of stimulating developing economies and of addressing the challenges of unemployment and poverty by creating new job opportunities. Gurrol and Atsan (2006) argue that in developing economies entrepreneurship is seen as an engine of economic progress, job creation and social adjustment. In South Africa, the government has recognised the need to support entrepreneurship in order to boost economic growth and create employment. The focus is on the small business sector because this sector, of which dental practices are a part, creates more jobs than large businesses and it has the potential to contribute to national economic growth. Defining both ‘entrepreneurship’ and an ‘entrepreneur’ is a difficult task and researchers have not yet agreed on universal definitions. Various authors have contributed to the definition of entrepreneurship, including, for example, Hisrich et al (2005), Timmons and Spinelli (2004), Van Aardt et al (2000), and Bygrave and Hofer (1991).

For the purpose of this research the definition of ‘entrepreneur’ by Nieman (2000) was used, which states that an entrepreneur is a person who sees an opportunity in the market, gathers resources and starts and sustains or grows a business venture to satisfy these needs. Entrepreneurs accept the risks associated with the venture – and are rewarded with the financial profits if it succeeds.

According to Singh and Purohit (2011) a successful entrepreneur in healthcare is someone who is willing to risk their money, understands the healthcare market, has a clear vision about the future of their business practice and works hard, typically for long hours, to succeed.

The decision to start a business practice is influenced by certain aspects of the potential entrepreneur; and two key factors have been recognised as having an influence on the initiative to start a business: capital and the role of an institution. Economic capital, in terms of access to finance, and cultural capital, in terms of knowledge, skills and attitude, are critical with regard to the decision-making process in starting up a business.

The reason for low entrepreneurial rates among social class, race and gender groups in South Africa is that not only has the subjugation of Black, Coloured and Indian citizens during the apartheid era left South Africa polarised with regard to skin colour, but also that these racial divisions overlap with social divisions and this increases the level of polarisation in a highly visible manner (Bond, 2004). Race as a category continues to stigmatise people in post-apartheid South Africa through a hierarchy in which past inequalities continue to worsen (McKinney and Soudien, 2010).

According to Zuma (2013), the president of South Africa, and the World Bank (2008), the three major development challenges facing South Africa are high levels of poverty, income inequality and unemployment. More than 35% of
the economically viable population of South Africa remains unemployed – the majority of which is Black South Africans (Bertelsmann, 2012). It has been estimated that some 56% of Black people are classified as ‘poor’ compared to around 36% of Coloured people, 15% of Indian people and 7% of White people (Bond, 2004). According to the World Bank Report in 2012, poverty in South Africa was more prevalent amongst women than men; and the Black African population was the most severely affected by poverty, with nearly 62% living below the poverty line (World Bank, 2012). These inequalities affect access to wealth and social benefits such as quality of neighbourhood, parental occupation and levels of education (Khwesa, 2009) and, therefore, access to financial resources necessary to start a business. In addition, severe economic constraints influence the quality and quantity of social or parental support, with resultant effects on opportunities for children and how they are raised and oriented towards education (Khwesa, 2009), all of which also have an effect on the ability to start a business practice.

Tertiary institutions or HEIs have a central role to play in offering entrepreneurship education which should result in students developing initiative and drive towards entrepreneurship, to prepare them to become successful and useful in the economy. According to Wilson et al (2007), entrepreneurship education can increase student interest in entrepreneurship as a career option. These authors state that the following objectives should be achieved through entrepreneurship education:

- Improvement of the entrepreneurship mindset of young people, to enable them to be more creative and self-confident in whatever they undertake and to improve their attractiveness for employers;
- Encouraging innovative business start-ups; and
- Improvement of individual roles in society and the economy.

The study by Wilson et al (ibid) shows that entrepreneurship education stimulates the intentions of individuals, with the expectation of improving the key entrepreneurship competences – which will have an impact not only on the role of the individual in the economy (working life), but also in society (social and personal life). Future HEI graduates have an important role to play in terms of their involvement in dealing with the economic problems of the nation. Instilling adequate insight and business skills has the potential to increase ambition and interest in entrepreneurship which, in turn, will lead to job creation.

As indicated earlier, students who enrol at tertiary institutions are generally socialised and educated, or trained, to become employees rather than business owners or employers after they graduate (Van Aardt and Van Aardt, 1997). According to Friedrich and Visser (2005) the ratio of business owners to employees in South Africa, a developing nation, is approximately 1 to 52: in most developed nations it is approximately 1 to 10. This large disparity in the ratios is a matter of major concern for the government and policymakers and it is therefore vitally important for tertiary institutions or HEIs to create an environment that encourages entrepreneurship to address the problem.

Professionally qualified people – such as dentists – soon realise that after graduating they have to choose between becoming employed or, alternatively, opening their own business practice (and perhaps, eventually, employing others). Limited attention has been given to developing or training dentistry students to become employers soon after their internship years, although there is significant potential for them to be self-employed and create employment. However, little is known about final year dentistry students’ intentions and knowledge with regard either to entrepreneurship or to starting a business practice shortly after they complete their internship.

It is assumed that dentistry students, after graduating, have limited ‘know-how’ concerning how to establish their business practice; and have little if any knowledge about basic business management. Under normal circumstances, dentists, due to their professional qualification, have relatively easier access to finance because they are regarded as low-risk clients by banks. This would imply that it is relatively easy for dentistry students to start a practice, with regard to securing the necessary funding.

We would therefore argue that dentistry students should be encouraged to consider entrepreneurship as a viable career option in dental education. Dentistry students are generally of an age at which the inherent risks associated with becoming an entrepreneur or starting a business practice are at their lowest levels. Educating them early enough would also give them sufficient time to acquire skills and experience that can prepare them for starting a business practice soon after they complete their internship.

The relationship between gender and entrepreneurship has received considerable attention over recent years. Trends and projections reported in the literature suggest that although women will play an increasingly important role in the entrepreneurial development of the economy, little is known about what young women in dentistry either understand or think with regard to starting a business practice. The attitudes of young women about entrepreneurship and their knowledge of the economy are likely to shape the entrepreneurial revolution and South Africa’s economic future, given that they comprise more than 52% of its population (Census South Africa, 2011). However, in the current economic and social climate in South Africa, the lack of representation of male and female and Black African and Coloured dentists suggests that entrepreneurship initiatives will be skewed with regard to race and gender (Lalloo, 2009).

Given the above considerations, this study was designed to collect data from a sample of final year dentistry students concerning their intentions towards and knowledge of entrepreneurship. The data were then used to investigate whether there were gender differences and differences among the various race groups with regard to starting a business practice.

LITERATURE REVIEW

Herrington et al (2009) pointed out that given the failure of the formal and public sector to absorb the growing number of job seekers in the country, increasing attention was being given to entrepreneurship and new enterprise creation and its potential for contributing to economic growth and job creation. Tertiary institutions or HEIs can be seen as an environment that can prepare students, including dentistry students, to start and operate a business practice, by providing the necessary knowledge and skills. Education about and for
entrepreneurship will increase the interest of
dentistry students in becoming self-employed at
some stage after graduation. According to Krueger
and Brazeals (1994) model of entrepreneurial
potential, entrepreneurship education should
improve the perceived feasibility of entrepreneurship
by increasing the knowledge of students, building
confidence and promoting self-efficacy. The model
argues that predicting potential entrepreneurs
on the basis of demographics, personality or
other criteria could prove difficult in an enacted
environment: the beliefs or attitudes of potential
entrepreneurs are driven by perceptions more than
objective measures. Similarly, Krueger et al (2000)
argue that entrepreneurial activity can be predicted
more accurately by studying intentions rather than
personality traits, demographic characteristics or
situational factors. A perceived lack of relevant
experience and a lack of self-confidence are two
reasons often cited for new graduates not engaging in
trepreneurship soon after graduation. The
HEI experience should be capable of addressing
both these needs (European Commission, 2008).
The university experience should also improve
the perceived desirability of entrepreneurship by
showing students that it is highly regarded and
socially accepted by the community and that it can
be personally rewarding work.

Another reason for introducing dentistry students
to entrepreneurship through structured education
during their university years is related to their careers.
Dyer (1994) discusses the different dimensions of
a theory of careers and applies those ideas to
entrepreneurship. He notes that a vital dimension
of socialisation that contributes to entrepreneurial
careers is the education and training that the
individual receives. Hussain et al (2008) found
that the two most compelling motivations for
starting a business were being one’s own boss and
financial reward (profit). Similarly Franco et al
(2010) found that independence, autonomy, self-
realisation and family tradition were all important
influences on the decision to start a business; in
contrast, demographic profile, social background
and participation in entrepreneurship education
were not related, with statistical significance, to
starting a business. Having self-employed parents
increases the propensity of offspring to become
self-employed (Birdthistle, 2008). Harris and Gibson
(2008) and Basu and Virick (2008) point out that
those students with experience of a family business
had better-developed entrepreneurial attitudes.

Entrepreneurship education in higher education
also tends to have a transformative effect on
participating students because it may lead to
increased numbers of business start-ups and the
development of unique, life-long learning skills that
form the basis of the attributes expected by society
at large (Jones, 2010). Similarly, Nyonkuru (2005)
reports that education is important in creating a more
entrepreneurial mindset among young people and
that promoting entrepreneurial skills and attitudes
provides benefits to society beyond their immediate
application to new business ventures. Driver et al
(2001) reported that there was an overall lack of
entrepreneurship elements in the education system
in South Africa. Some of the factors that contribute
to an entrepreneurial culture have been found to
be attitudes towards entrepreneurship, business
role models, negative mindsets regarding self-
confidence, initiative and creativity, and negative
perceptions about entrepreneurship as a career
choice (Brijjal, 2008).

Most studies on entrepreneurship have been
conducted in developed nations. As such, it was
felt it would be of interest to conduct studies in a
developing nation, such as South Africa, to determine
whether the results obtained would be in agreement
with those of developed nations. This study will
thus add to the various debates in the broad field
of entrepreneurship, with particular reference to
the issues of gender and race. Studies comparing
entrepreneurial intentions and knowledge with
gender to the different race groups and to gender
are rare in a developing nation such as South
Africa, although a recent study by Brijjal (2011)
revealed significant differences in knowledge of
entrepreneurship across the various disciplines, the
various population groups and genders. This current
study focuses on final-year dentistry students and
attempts to determine to what extent entrepreneurial
intentions and knowledge differ across the different
race groups and between men and women. It is
hoped that the outcomes from the research will
add value to institutional programmes in terms of
how students are engaged with regard to becoming
and working as entrepreneurs.

METHODOLOGY
The study used a random sample of final-year
dental students, over two years, at the University
of the Western Cape, this being the only institution
that offers dentistry in the province. The survey
questionnaire was sent to 216 registered students
and 205 completed questionnaires were returned,
a response rate of 95%. The survey questionnaire
included questions similar to those used by Kourilsky
and Walstad (1998) in their study of gender differences
in entrepreneurship: it was adapted to suit the South
African context. The reliability and validity of the
questions in the survey had been established in
previous studies conducted by Walstad and Kourilsky
(1996) with both high school students and adults.
For the present programme a pilot study with five
students and two academics was conducted before
the final questionnaire was distributed, and the
questionnaire was also validated by two academics
in the field of business management. Participation in
the questionnaire survey was voluntary, anonymous
and confidential.

The final version of the questionnaire was
distributed to final-year students during class times.
Data from the questionnaires were captured on a
spreadsheet and analysed using the SPSS package.1
Statistical techniques of univariable analyses
(frequencies and percentages) and bivariable
analyses (cross-tabulations) were used. A descriptive
analysis was used to describe and highlight the
variables, with inferential statistical tools used in
the analysis of the relationships between variables
of interest. Intentions towards entrepreneurship
were measured using a Likert-style scale with
values ranging from 1 (‘not at all important’) to 5
(‘very important’), and knowledge was measured
using a nominal scale. For the purposes of this
study the term ‘entrepreneurship’ was regarded
as synonymous with setting up a business practice.
Given the background and literature review, the
following hypotheses were developed.

- **Hypothesis 1.** The intentions of final-year
dentistry students with regard to starting
a business practice are the same for men
and women.

- **Hypothesis 2.** The intentions of final-year
dentistry students with regard to a
business practice are the same across
different race groups.

- **Hypothesis 3.** Knowledge of
final-year dentistry students about
entrepreneurship does not differ among
different race groups.

- **Hypothesis 4.** Knowledge of
final-year dentistry students about
entrepreneurship does not differ
between men and women.

RESULTS AND ANALYSIS
The final questionnaire comprised three sections:

- **Section A** was based on demographic variables.
- **Section B** sought feedback on the importance of
entrepreneurship education at tertiary institutions,
personal intentions with regard to starting a
business practice, views on entrepreneurs
being philanthropic and whether or not students
were personally acquainted, through family or
otherwise, with business owners.
- **Section C** included general questions about
knowledge of entrepreneurship.
The results were as follows, dealing with each section in turn.

Demographics

The profiles of the students in terms of race and gender are shown in Table 1. White (37%) and Indian (3%) students together represented the greater proportion, a result clearly not representative of the population of South Africa where Africans represent 79.2% of the total population. Coloured and White groups each represent 8.9% and the ‘Indian/Asian/other population’ group 3%. With regard to gender, more female (56%) than male (44%) students responded.

The need for entrepreneurship education

Eighty-eight percent of male students and 89% of female students indicated the need for entrepreneurship education that would equip them to become business owners soon after graduation. This is in agreement with results from the recent study by Brijlal (2011) which indicated that dentistry students showed the greatest need to start up a business soon after graduation. This is in agreement with results from the recent study by Brijlal (2011) which indicated that dentistry students showed the greatest need for entrepreneurship education as part of their education in their final year of study.

Intention to start own business practice

Table 3 reports the responses, according to gender and race, of the students to the question about whether or not they planned to start a business practice soon after graduation. Fifty percent of those responding reported that they intended to do so. Regarding gender, there was a significant difference in intention to start a business practice (p <0.05), with 66% male students, compared with 45% of female students, indicating their intention to do so. This result was surprising, given that male and female students gave very similar levels of response – 88% and 89% respectively – on the need for entrepreneurship education as part of their curriculum. The fact that fewer females indicated an interest in starting a business may relate to the informal observation that women generally may have a lower risk propensity and are therefore more cautious when it comes to starting a business. This supports the findings of other researchers, including for instance Kourilsky and Walstad (1998), Delmar and Davidson (2000), de Bruin et al (2007) and Wilson et al (2007), who found that women had a significantly stronger preference for self-employment than men.

There was no significant difference in intentions among the various race groups with regard to wanting to start a business practice soon after graduation. Sixty-four percent of African students stated that they would like to do so and this result supports those of a study by Kollinger and Minniti (2006) who also found that Africans were more likely to try starting businesses than Whites. Similarly, Wilson et al (2004) reported a higher level of interest in entrepreneurship among young Black (African) people than among young White people in the USA. This finding is important because it suggests that constraints and not preferences lie behind racial differences in business ownership. The finding also seems to suggest that African students perceive themselves and their entrepreneurial environment in a much more optimistic light than White students. Furthermore, these results suggest that there is a large potential pool of African students who may decide to start a business practice soon after graduation in the field of dentistry. These African students may therefore need the necessary entrepreneurship education and encouragement if they are to follow up and act on their interest.

Philanthropy (social responsibility)

Seventy-seven percent of those responding indicated that dentists currently in practice should be...
business start-up, the more likely it is that they will know someone who has been successful in a business. Thus it appears that the better a person often influence those thinking about starting a business. (1990), have reported that role models (2012), Walstad and Kourilsky (1998) and Green business. Knowing someone who already runs a successful business can influence the intention to start a business. Of those who responded ‘yes’ to wanting to start a business, 85% knew someone who already owned a business.

Role models
There was a significant difference (p<0.05) between the different race groups with regard to knowledge of entrepreneurs or business role models. The Indian students were the most acquainted (95%) and the African students least (67%) with entrepreneurs or those running a business practice. Of those who responded ‘yes’ to wanting to start a business, 85% knew someone who already owned a business. Knowing someone who already runs a successful business can influence the intention to start a business.

Many studies, such as those by Bosma et al (2012), Walstad and Kourilsky (1998) and Green and Pryde (1990), have reported that role models often influence those thinking about starting a business. Thus it appears that the better a person knows someone who has been successful in a business start-up, the more likely it is that they will be interested in starting a business, because they have a role model to follow. The fact that a significant number of students had such a role model might suggest that these students would be inclined to start a business practice soon after graduation.

Knowledge of entrepreneurship
Eight multiple-choice questions were included in the survey questionnaire to determine levels of basic knowledge about entrepreneurship. This was done on the premise that knowledge of basic business concepts could have an influence on the intention to start a business. Table 4 lists the general topics covered by these eight questions and shows the percentage of correct responses for each item, with regard to gender and race.

There was no significant difference among the different race groups or between men and women with regard to knowledge of entrepreneurship. So, for instance, male and female students had similar levels of knowledge, scoring mean values of 62% and 60% respectively. The results shown in Table 4 show that whilst the White students obtained the highest mean score (66%) and the African students obtained the lowest mean score (56%), there were significant differences for the individual questions (p<0.05); in particular, with regard to the questions about job creation (Whites, 73%; Africans, 46%) start-up capital (Indians, 21%; Coloured, 3%) and purpose of profits (Africans, 73%; Coloured, 45%).

It is interesting to note that the majority of the students answered that in South Africa the banks were the main source of finance for starting a business practice. In reality, most start-up capital comes from personal savings or family funds (Beck et al, 2006; Still and Walker, 2006; Peterson and Rajan, 1994). This incorrect perception needs to be changed, because raising finance is considered to be one of the main problems with regard to starting a business and students need to be aware that it is more likely to be the case that sources of funding other than the banks will be used.

Students were also questioned about what would motivate them most if they did set up their own business. Four categories were offered as choices: ‘to build something myself’, ‘a desire to make money’, ‘to be my own boss’ and ‘family influence’. For the Coloured and White students the most popular was ‘to build something myself’; for African students it was ‘to build something myself’ coupled with ‘to be my own boss’; for Indian students it was ‘a desire to make money’. From a gender perspective the most popular motivation for men was the ‘a desire to make money’, for women it was ‘to build something myself’. According to Galloway and Brown (2005), the numbers of student graduates starting up entrepreneurial ventures may be low because, among other reasons, students often have loans to pay off, have no collateral, lack relevant experience and have other personal priorities. Dentistry students are required to undertake one year of internship at a state institution and this may deter them from starting their own business practice because they become accustomed to being employed early in their careers.

<table>
<thead>
<tr>
<th>Topics addressed</th>
<th>Gender</th>
<th>Race group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Description of entrepreneur</td>
<td>85%</td>
<td>78%</td>
</tr>
<tr>
<td>Small business and job creation</td>
<td>42%</td>
<td>58%</td>
</tr>
<tr>
<td>Start-up capital</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>Business survival</td>
<td>87%</td>
<td>86%</td>
</tr>
<tr>
<td>Example of franchise</td>
<td>87%</td>
<td>81%</td>
</tr>
<tr>
<td>Purpose of profits</td>
<td>67%</td>
<td>59%</td>
</tr>
<tr>
<td>Price determination</td>
<td>58%</td>
<td>47%</td>
</tr>
<tr>
<td>Demand and price</td>
<td>60%</td>
<td>64%</td>
</tr>
<tr>
<td>Mean %</td>
<td>62%</td>
<td>60%</td>
</tr>
</tbody>
</table>

Table 4 Knowledge of entrepreneurship

Note: *p<0.05.
TESTING THE HYPOTHESES

Having investigated the intentions, knowledge and gender differences of final-year dentistry students with regard to entrepreneurship or starting a business practice, the hypotheses proposed and the outcomes are as follows.

- **Hypothesis 1.** The intentions of final-year dentistry students with regard to starting a business practice is the same across gender. *This hypothesis was not supported.* There was a significant difference between male and female students in wanting to start a business: men (66%) were more likely than women (45%) to start a business practice.

- **Hypothesis 2.** The intentions of final-year dentistry students with regard to a business practice are the same across the different race groups. *This hypothesis was not supported.* African students (64%) showed a greater interest in wanting to start a business practice than other race groups.

- **Hypothesis 3.** The knowledge of final-year dentistry students about entrepreneurship does not differ among the different race groups. *This hypothesis was not supported.* White students scored the highest and African students scored the lowest.

- **Hypothesis 4.** The knowledge of final-year dentistry students about entrepreneurship does not differ between men and women. *This hypothesis was supported.* Male and female students had equal knowledge of the concepts of entrepreneurship.

CONCLUSIONS

The findings from this study show that both men and women dentistry students and those from all race groups believe that entrepreneurship education is important. Although more than 50% of the students expressed an intention to become entrepreneurs soon after graduation, in reality the actual number doing so may be significantly lower.

The intention to start a business practice differed significantly with regard to gender: more male than female students were interested in starting a business practice, although there was no significant difference between the men and women regarding knowledge of entrepreneurship.

More African students wanted to start a business compared to other race groups; and White students showed the best results in answering questions on knowledge of entrepreneurship. There were significant differences in the responses to individual questions on knowledge of entrepreneurship, with the White students scoring the highest and African students scoring the lowest.

RECOMMENDATIONS

Higher education institutions play a key role in influencing the intentions of final-year students with regard to starting a business practice. Offering entrepreneurship education in the final year of studies for dentistry students in the HEI involved in this present study might therefore increase the propensity to start a business practice soon after graduation. We would therefore argue that the Dentistry Faculty concerned should attempt to improve the perceptions and knowledge of business start-up of its dentistry students.

In order to create and to support entrepreneurship as an option after graduation, we suggest that the HEI concerned might find it helpful to consider some of the following options:

1. Include a credit-bearing module in entrepreneurship education in the final year, dealing with how to start a dental practice or business: this should also include job shadowing. Soutar et al (2007) argue that entrepreneurship educational programmes significantly raise students’ subjective norms and intentions toward starting a business.

2. Specific attention should be given to female students because it was found that they were less inclined to want to start a business practice soon after graduation.

3. If inclusion of a credit-bearing module in the curriculum is a problem, then the HEI’s primary purpose should be to develop entrepreneurial capacities and mindsets of students through short entrepreneurship education programmes which should aim to develop entrepreneurial drive among students (raising awareness and motivation), train students in what is needed to set up a business and manage its growth and develop the entrepreneurial abilities needed to identify and exploit business opportunities.

4. Students embarking on an entrepreneurial career path should have greater access to government financial support throughout their study. Private sector investment initiatives in entrepreneurial education should also be supported and national and local government should provide incentives to private sector enterprises that support high quality entrepreneurial programmes (Nicolaides, 2011).

LIMITATIONS AND FUTURE RESEARCH

This was a regional study and therefore the findings might not relate in general to all dentistry students in South Africa. Knowledge of entrepreneurship was assessed using only eight basic questions and closed questions only were used, both of which factors might have had the effect of hindering full disclosure by students of their full knowledge of entrepreneurship.

Future research should consider analysis on a national basis because the outcome could then have a greater influence on business policy making. Research should also track dentistry graduates after internship in order to determine the start-up rate and the reasons for starting up a business. In addition, those graduates who choose to not start a business practice should be questioned about the reasons for this decision.

NOTES

1. [IBM] SPSS Statistics is, according to IBM, a ‘... comprehensive, easy-to-use set of data and predictive analytics tools for business users, analysts and statistical programmers’, see also http://www-01.ibm.com/software/uk/analytics/spss/products/statistics/.

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DENTAL ANAESTHESIA:
OVERVIEW OF INJECTABLE AGENTS USEFUL FOR NONSURGICAL PERIODONTAL THERAPY

Laura Webb (Acknowledgement: This article first appeared in RDH Magazine, copyright 2016.

Nonsurgical periodontal therapy (NSPT) procedures are generally elective procedures requiring intermediate duration anaesthetics (see Table 1). Everything that we need to provide safe, effective local anaesthesia for our patients is available to us. So how do we choose? The selection of agents for NSPT should be based on patient profile, length of procedure, and the need for haemostasis. An overview of important agents (generic names) available in the United States is also discussed in this article, as well as their general considerations as they relate to NSPT with adult patients.

Table 1: Intermediate-duration of action local anesthetics in US

<table>
<thead>
<tr>
<th>Agent</th>
<th>Onset</th>
<th>Pulpal</th>
<th>Soft tissue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articaine</td>
<td>Epinephrine</td>
<td>2–3 min</td>
<td>60 min</td>
</tr>
<tr>
<td>4%</td>
<td>110,000</td>
<td>1–2 min</td>
<td>60–75 min</td>
</tr>
<tr>
<td>4%</td>
<td>1,200,000</td>
<td>1–2 min</td>
<td>45–60 min</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>Epinephrine</td>
<td>2%</td>
<td>110,000</td>
</tr>
<tr>
<td>2%</td>
<td>120,000</td>
<td>1,5–2 min</td>
<td>60 min</td>
</tr>
<tr>
<td>Mepivacaine</td>
<td>Levonordefrin</td>
<td>4%</td>
<td>1,200,000</td>
</tr>
<tr>
<td>4%</td>
<td>120,000</td>
<td>2–4 min</td>
<td>60–90 min</td>
</tr>
<tr>
<td>4% plain</td>
<td>None</td>
<td>2–4 min</td>
<td>40–60 min (block)</td>
</tr>
</tbody>
</table>


AGENTS AND VASOCONSTRICTORS

All injectable dental local anaesthetics available in North America today are amide local anaesthetics. These agents are safe, non-allergenic, usually metabolised in the liver, and excreted by the kidneys (exceptions discussed later). They are also mild vasodilators, which result in an increased rate of anaesthetic absorption into the bloodstream, an increased risk of systemic toxicity, reduction of duration of action, and increased bleeding in the area.

Vasoconstrictors are added to local anaesthetic agents to counteract the vasodilatory properties. By constricting the blood vessels in the area, absorption is decreased, resulting in reduced risk of systemic toxicity, increased duration of action, and increased haemostasis.

When providing local anaesthesia, agents containing vasoconstrictors should be used unless there is a compelling reason or absolute contraindication not to use them. An absolute contraindication describes a circumstance when a drug should not be administered under any circumstances because it is unsafe. A relative contraindication describes a circumstance when the drug may be used carefully after thoughtful consideration of risk vs. benefit and when a safer alternative is not available. Most of the patients we treat fall into the latter category because there are few absolute contraindications to the administration of dental local anaesthetic agents for patients who are eligible for elective procedures, such as NSPT (see Table 2).

The two vasoconstrictors that are available in the US are epinephrine and levonordefrin. Epinephrine is available in the dental anaesthetics lidocaine, articaine, prilocaine, and bupivacaine. In US dental cartridges, epinephrine is formulated in 1:50,000, 1:100,000, and 1:200,000 concentrations. It should be noted that the duration of effect for pulpal and soft tissue anaesthesia is essentially the same with all these vasoconstrictor concentrations, and therefore the lowest concentration available is recommended. The 1:100,000 and 1:200,000 concentrations usually provide good haemostasis for NSPT. Agents with 1:200,000 epinephrine may be useful when it is necessary to limit vasoconstrictor dose (see Tables 2, 3). The highest concentration, 1:50,000, is recommended only when additional haemostasis is required and should be administered in very small volume as infiltration (papillary) injections adjacent to site of bleeding. Levonordefrin is one-sixth as potent as epinephrine and is only available in 2% mepivacaine and 1:20,000 levonordefrin. It provides significantly less haemostasis than epinephrine and therefore is less useful...

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Table 2: Examples of modifications for use of local anesthetics and vasoconstrictors during NSPT

<table>
<thead>
<tr>
<th>Modifications</th>
<th>Medical conditions</th>
<th>Drug interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vasoconstrictors</td>
<td>All VC – Absolute contraindication</td>
<td>Bisulfite allergy</td>
</tr>
<tr>
<td></td>
<td>Levonordefrin – Absolute contraindication</td>
<td>Bisulfite allergy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cocaine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tricyclic antidepressants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Antidepressants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Antidysrhythmics, CNS depressants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Antidepressants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Antidysrhythmics, CNS suppressants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Antidysrhythmics, CNS depressants</td>
</tr>
<tr>
<td>Anesthetic Agents</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Absolute contraindication</td>
<td>Amide local anesthetic allergy (extremely unlikely)</td>
</tr>
<tr>
<td></td>
<td>Physician consult</td>
<td>Malignant hyperthermia (presence of, or high risk for)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cholinesterase inhibitors</td>
</tr>
<tr>
<td></td>
<td>Avoid prilocaine</td>
<td>Methemoglobinemia or oxygenation challenges</td>
</tr>
<tr>
<td></td>
<td>Limit lidocaine</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cimetine, Propranolol</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Significant liver dysfunction, Significant renal dysfunction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Antidysrhythmics, CNS suppressants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Significant liver dysfunction</td>
</tr>
</tbody>
</table>

levonordefrin is not available. the gold standard by which all others are judged and holds 49% of the US great improvement over the ester agents previously available. it remains lidocaine, marketed in 1948, was the first amide local anaesthetic and a Lidocaine

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(see Table 3). The risks of using epinephrine vs. the benefits should always be considered. Recall, though, that inadequate pain control may result in the release of unpredictable amounts of endogenous epinephrine, perhaps exceeding the dose that would be provided by the hygienist. The more medically compromised a patient is, the greater the need for profound anaesthesia.1,2

All dental local anaesthetic cartridges with vasoconstrictors contain bisulfite preservatives. Bisulfites are also commonly found in food and beverages. Hypersensitivity to bisulfites has been reported, particularly with asthmatics (<10% of asthmatics).2 Patients who have demonstrated a true allergy to bisulfites should not receive a local anaesthetic containing vasoconstrictors (an absolute contraindication).

## Table 3: Epinephrine – Maximum recommended dose per appointment

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Healthy adult patient</th>
<th>Adult patient with significant cardiovascular disease</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dose</td>
<td>Cartridges</td>
</tr>
<tr>
<td>1:50,000 Epinephrine</td>
<td>0.2 mg</td>
<td>5.5</td>
</tr>
<tr>
<td>1:100,000 Epinephrine</td>
<td>0.2 mg</td>
<td>11.1*</td>
</tr>
<tr>
<td>1:200,000 Epinephrine</td>
<td>0.2 mg</td>
<td>22.2*</td>
</tr>
</tbody>
</table>

Source: Maximum Recommended Dose (MRD) per appointment, epinephrine.


## Table 4: Elimination half-life of local anesthetics

<table>
<thead>
<tr>
<th>Drug</th>
<th>Half-life</th>
<th>98.5% decrease in blood level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articaine</td>
<td>44 min*</td>
<td>4.4 hours*</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>96 min</td>
<td>9.6 hours</td>
</tr>
<tr>
<td>Prilocaine</td>
<td>96 min</td>
<td>9.6 hours</td>
</tr>
<tr>
<td>Mepivacaine</td>
<td>114 min</td>
<td>11.4 min</td>
</tr>
</tbody>
</table>

Source: Half-life is time required for 50% of drug to be removed from the blood.


### SPECIFIC AGENTS

#### Lidocaine

Lidocaine, marketed in 1948, was the first amide local anaesthetic and a great improvement over the ester agents previously available. It remains the gold standard by which all others are judged and holds 49% of the US market share.1 It is compounded with epinephrine as 2% lidocaine, 1:100,000 epinephrine and 2% lidocaine, 1:500,000 epinephrine. Lidocaine is absolutely contraindicated in patients with true allergy to amide type local anaesthetics (extremely unlikely) or patients with known bisulfite allergy.

Mepivacaine

Mepivacaine, marketed in 1960, is available as 2% mepivacaine, 1:20,000 levonordefrin and 3% mepivacaine (plain). Mepivacaine has a milder vasodilatory effect than most other amides and so it may be useful with patients for whom vasoconstrictor is contraindicated and cannot receive 4% prilocaine plain.

However, the duration of action for 3% mepivacaine plain is short. Mepivacaine is absolutely contraindicated in patients with true allergy to amide type local anaesthetics (extremely unlikely) or with the 1:20,000 levonordefrin formulation, patients with known bisulfite allergy or taking tricyclic antidepressants.

Prilocaine

Prilocaine, marketed in 1965, is less toxic and less potent than lidocaine or mepivacaine and provides a slightly longer duration of action. It is available as 4% prilocaine 1:200,000 epinephrine and 4% prilocaine (plain).

An interesting feature regarding prilocaine plain is that not only does it have a milder vasodilatory effect than most other amides, but, when providing a block injection, it is the only intermediate duration plain local anaesthetic. It can be a good choice for patients for whom vasoconstrictor is contraindicated. Both formulations of 4% prilocaine are recommended for patients with epinephrine sensitivity and requiring intermediate duration of action.

Prilocaine reduces the blood’s oxygen-carrying capacity in higher doses (doses greater than maximum recommended dose) and, therefore, is relatively contraindicated for use with patients at risk for methaemoglobinaemia, patients with problems of oxygenation such as sickle cell anaemia, cardiac/respiratory failure, and also for patients who are receiving acetaminophen or phenacetin because methaemoglobin levels are increased.

Since prilocaine is also metabolised in the lungs and kidneys, it is metabolised more easily by the liver than lidocaine or mepivacaine. In addition, it clears the kidneys more rapidly than other amides.1 Prilocaine is absolutely contraindicated in patients with true allergy to amide type local anaesthetics (extremely unlikely) and if using the 1:200,000 epinephrine formulation, in patients with known bisulfite allergy.

Articaine

Articaine has been available in Europe since 1976, but was not marketed in the United States until 2000. It is the second most popular local anaesthetic in the US, currently holding 35.6% of the US market share, and is the leading dental anaesthetic in Canada and Europe.1,2 Its popularity has been attributed to higher injection success rates related to increased lipid solubility and faster diffusion through hard and soft tissues, including palatal root anaesthesia with buccal injections and mandibular anaesthesia with subperiosteal injections.15-17 Reports also indicate more profound and longer duration of anaesthesia.6

Classified as an amide with amide and ester characteristics, it is 1.5 times more potent than lidocaine and has similar toxicity. In the US, it is compounded with epinephrine as 4% articaine, 1:100,000 epinephrine and 4% articaine, 1:200,000 epinephrine. Biotransformation occurs both in the plasma and the liver. Because of its unique composition and biotransformation pathway, the elimination half-life (time required for 50% of a drug to be removed from the blood) of articaine, as reported by manufacturers, is only 44 minutes, four more than twice as fast as all other amide agents, resulting in a decreased risk of system toxicity (see Table 4). This is significant, particularly for patients for whom a higher rate of biotransformation may be desired (children, medically compromised, pregnant, nursing, liver disease, etc.). Some experts report that the elimination half-life of articaine is only 27 minutes (2.7 hours to decrease in blood level 98.5%) – even more rapid!!

Articaine is absolutely contraindicated in patients with a known history of hypersensitivity to local anaesthetics of the amide type, or in patients with known bisulfite allergy.
OTHER CONSIDERATIONS

There has been some controversy about the use of 4% local anaesthetics such as prilocaine and articaine with regard to increased neurotoxicity and increased risk of paraesthesia. Only one study (Pogrel 2012) has been clinical in nature and was “based on patients actually seen and examined by a single clinician”. In the Pogrel study, it was determined that the number of cases of paraesthesia from articaine was proportional to its market share. Other reports have been retrospective in nature, reliant upon malpractice reports, and, therefore, may have been susceptible to reporting bias.

In a recent in vitro local anaesthetic neurotoxicity study, it was concluded that articaine was the least neurotoxic and had the most favourable safety profile compared with lidocaine, mepivacaine, and prilocaine.

Other experts assert that the paraesthesia is most often related to mechanical trauma, not chemical trauma, because the lingual nerve is in the path of the sharp dental needle during provision of the IA block. This opinion is supported, in part, by the following:

- 95% of paraesthesia cases occur in the mandible (usually the lingual nerve);
- There are no reports of paraesthesia after provision of the Gow-Gates and Vazirani-Akinosi injections (where the lingual nerve is not in the vicinity); and
- There are no reports of paraesthesia after the use of articaine in medicine.

Additional studies are needed, as the evidence is inconclusive regarding a greater risk of paraesthesia with the use of articaine compared with the other local anaesthetics.

We choose local anaesthetic agents based on our professional judgment, experiences, and the patient’s profile. Information regarding the dosages, safety, and effectiveness of agents is constantly being updated. Continuous exploration of the scientifically-based literature regarding local anaesthetic agents is essential so we may ensure effective and safe provision of local anaesthesia for our patients. RDH

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INTRODUCTION
Controlling periodontal and dental diseases has been and still is a major concern in patient overall health, not only because destruction of the tooth and tooth-supporting structures can cause serious prejudices to the patient’s function and esthetics, but more so because chronic sustained inflammation is marked by an increased production of pro-inflammatory cytokines that result in local tissue damage and create an inflammatory cascade that in turn contributes to systemic inflammation and the aggravation of several systemic diseases and conditions (coronary heart diseases, respiratory diseases, preterm birth, low birth weight, cerebral disease, diabetes).

Bacteria living in a well-organised complex microcosm, called biofilm, remain the first structure to target, a task that is quite demanding to achieve mechanically and more so chemically because of defence mechanisms built within the biofilm that make the microbes resistant to the host immune system and to the effects of antimicrobial drugs, sustaining a continuous growth of the microbial communities living within it, unabated.

The production of proteolytic enzymes and toxins by gram-periodontal pathogens and the stimulation of the body’s immune response result in serious destruction of the tooth periodontal support. The daily mechanical elimination of the biofilm with the toothbrush and other aids is a quite demanding effort and dramatically linked to patients’ compliance. Using chemical agents to assist in plaque removal has been widely accepted and remain today one of the great chemical agents to assist in plaque removal has been widely accepted and remain today one of the great chemical agents. The second generation included those possessing substantivity (cetylperidinium chloride, essential oils, phenolic compounds, iodine, fluorides). The third generation included those antiseptics that interfere with bacterial adhesion (delpominal).

Chlorhexidine digluconate (CHX)
CHX by virtue of its substantivity remains the gold standard of chemical antimicrobial agents. At low concentration it is bacteriostatic, causing limited damage to the bacterial cell wall. It becomes bactericidal at high concentration. It is attracted to the negatively charged bacterial cell wall, altering its integrity. By binding to phospholipids in the internal cell membrane it increases permeability and leakage of low molecular weight components such as potassium ions which leads to major damage in the cytoplasm and results in bacterial death. Thanks to its substantivity, it is slowly released from all oral surfaces serving as bacterial reservoir and offers a sustained bacterial control. It influences pellicle formation by blocking the acidic groups in salivary glycoproteins, reducing protein adsorption on the tooth surface and plaque adsorption by binding to the bacterial surface in sub-lethal amounts.

Bacterial attachment to enamel is limited although not completely inhibited. Although a simple rinse can reduce the oral flora by 10–20% for several hours, millions of bacteria present in saliva, on the oral surfaces and the subgingival areas as well as those in the biofilm, remain little affected.

How often should a CHX mouthwash be used and what should be its ideal concentration to support its activity and limit its side effects? Three times daily rinses with a 0.12% CHX has been shown to match after three weeks the effect of optimally performed oral hygiene (BreX 1989). Likewise, it was shown that 400 ml per day of 0.02% applied with an oral irrigator is the minimum at which an optimal level of plaque control can be achieved (Lang 1991). 40 mg of CHX needs to be delivered daily if a good anti-plaque action is to be anticipated, the equivalent of a twice daily rinse with 15 ml of a 0.12% solution (Jones 1997).

Comparing two concentrations of CHX (0.12% and 0.03% added to 0.05% cetylpyridinium chloride), it was shown that plaque reduction was similar with less negative impact on taste perception with the reduced concentration (MorReinoso, 2015).

However, long-term use of CHX is undermined by a score of side effects like tooth staining that comes from local precipitation of chromogens found in food and beverages on tooth-bound CHX. Limiting the use of these beverages will limit the formation of stain. Also, the mouthwash needs to be used last.
thing at night when no beverages are likely to be taken. Taste disturbance, calculus formation, burning sensations, oral desquamation, paresthesia, cheilitis or perioral dermatitis may result from CHX use and affect patient compliance.

Also one needs to remain attentive to the possible interaction of CHX with chemicals present in tooth pastes (SLS) used as detergent as these may reduce the plaque inhibition effect of CHX, especially when the dentifrice is used as a slurry rinse. However, when used as a toothpaste, no effect on CHX antibacterial activity has been observed (Elkebrout, 2015).

Essential oils used as a mouthwash
Listerine, composed of four oils – thymol, menthol, eucalyptus and methyl salicylate – is a product over 130 years old, developed by Lawrence and Lambert, and named after the English physician Sir John Lister, the father of antisepsics in surgery. These phenolic compounds have an anti-inflammatory and proaglandin synthetase-inhibiting activity that explains their effect on gingival inflammation. They have a less pronounced effect on plaque (Sekino, 2005). Yet, 34% reduction of gingivitis and 50–60% reduction of plaque formation were observed after nine months of daily use in addition to tooth brushing (Lamster 1983) and no emergence of opportunistic pathogens. Although effective in daily rinse by reducing bacterial load in the oral cavity with no side effects, essential oils do not have substantivity and have little action on the hydrophobicity of the enamel. It disrupts bacterial cell wall and inhibits bacterial enzymes.

Quaternary ammonium
The most commonly used is cetlypyridinium chloride. These cationic surface active ingredients destroy bacteria by disrupting their cell wall. They are effective in reducing plaque and gingivitis but have no substantivity (Lobene, 1977).

Triclosan
It is a bisphenol with wide antimicrobial activity. It has been combined to zinc citrate for additional antiplaque activity. Also, it was combined to a co-polymer of polyvinyl and maleic acid to increase its substantivity and plyphosphate to improve its anti-calculus capacity. In daily use it showed a 20% reduction in gingivitis and 25% reduction in plaque (Cubbels, 1991).

Povidone-iodine
It is an iodophore quite effective against many types of organisms. It has been used as a mouth wash to reduce plaque formation and control gingivitis. It proved to be more effective when combined to H2O2 (PVPi 0.5%–H2O2 1.5%). Short- or long-term exposure to PVPi has not resulted in an increased level of bacterial resistance, but there has been many concerns about its daily use because of the possibility of iodine toxicity, allergy to iodine and tooth staining (Greenstein, 1999).

CLINICAL INDICATIONS OF A CHEMICAL ANTIPLAQUE AGENT
Mechanical control of the bacterial biofilm may be hard to achieve. The rationale for the use of chemical antiplaque agents to supplement mechanical oral hygiene is compelling and has good indications (Addy, 1997).

a. As an adjunct to mechanical plaque control during the active phase of periodontal therapy. CHX sprays can be used in handicapped. CHX chewing gums also showed some benefits.

b. Following oral surgical procedures where hygiene is more difficult and the need to control plaque is more important.

c. In physically and mentally handicapped where oral hygiene is difficult if not impossible.

d. In medically compromised patients predisposed to oral infections. CHX can be a good anti-candida agent in combination with anti-fungals.

e. In high risk caries patients, CHX has shown a synergistic effect to fluoride in caries prevention.

f. In assisting patients with fixed or removable orthodontic appliances.

h. In limiting bacteremia and bacterial aerosol following the use of dental instrumentation.

HOW TO SEE THE FUTURE OF ANTISEPTICS IN ORAL CARE
Antiseptics had and will still have a prominent role in patients’ oral care. Many formulations proved to be effective in reducing plaque formation and gingivitis and to have beneficial effects when mechanical plaque control is difficult. It is important to remember that, once the use of the mouthwash is ceased, plaque formation regain rapidly previous levels meaning that long term use of a “safe” antimicrobial agent is needed for long-term biofilm prevention. Combining antiseptics may allow the reduction of their individual concentration, limit their side effects while maintaining good levels of activity. Microbes living in a planktonic form are easy to eliminate. They become more difficult to reach when they form a biofilm. Therefore, the target of a good antimicrobial agent must be to reduce bacterial load but also to prevent plaque formation by changing the hydrophobicity of the enamel surface without destroying the ecology of oral microflora. It has to eliminate the biofilm where it has the most deleterious effects, which is at the dento-gingival interface. It is also important to note that the cost of a twice daily rinse with CHX or essential oils is over $200 over a period of one year, which may be a deterrent for low-income populations.

Many antiseptics have the capacity to destroy the free bacteria, but have no substantivity nor the capacity to interfere with the tooth surface and effectively interact with plaque formation. So far, chlorhexidine solutions remain the gold standard of antiseptics when it comes to plaque control until new formulations are developed to improve their activities and reduce their side effects.

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Body piercings have been around for a long time as a way for individuals and cultures to express themselves through ornamentation. The ancient Egyptians pierced their navels to signify royalty. Roman centurions wore nipple rings as a sign of virility and courage. The Mayans pierced their tongues for spiritual purposes. The Eskimos and Aleuts pierced the lips of female infants as part of a purification ritual, and the lower lips of boys as part of passage into puberty. In the late 1990s, body piercing became popular in Western society. It has continued to be popular even at the present time.

Due to this increase in popularity, it is important that dental hygienists recognize the different types of piercings, the warning signs of infection, and understand possible complications and the professional obligations associated with oral piercings.

There are many types of oral piercings that can cause complications to oral health. One example is lip piercing. There are currently at least 13 different ways to get a lip piercing. Vertical labret piercings, snakebile piercings, and Monroe piercings are some of the most common lip piercings. People have the option of a lip stud or lip ring. If a lip stud is chosen, a labret stud is a better option due to the flat disk on the back of the stud. The flat disk on the back is less likely to irritate the gums or other parts of the mouth than the inner curve of a ring. A bio plastic labret stud could also be used instead of a labret stud for a softer backing.

One oral health problem with lip piercings is that they can cause gingival trauma and recession in relation to lip studs. Lip piercings are prevalent, but the most common type of oral piercing is the tongue piercing. Many people opt to have a single tongue piercing, which is usually in the middle of the tongue in a vertical position. Others choose to pierce their tongue in a horizontal manner, displaying the two barbells on the lateral surfaces of the tongue, or have multiple rings placed throughout the tongue. When people first pierce their tongue, they’re given a surgical steel ring that will help decrease swelling of the tongue.

The surgical steel ring is usually one inch in length and made from steel that is approved for body implants. This type of jewelry is one of the heaviest metals, but many people choose surgical steel due to its durability, strength, and lower likelihood of allergic reactions.

Although surgical steel is a common metal used for tongue rings, there are other materials that can be used as well, such as titanium, 14 karat gold, and acrylic. Titanium is very popular because of its durability and less stress on piercings, while 14 karat gold is better to use after the six-week healing process. The ideal ring is acrylic, which is more flexible and provides the user with more versatility.

The reason most people switch to acrylic after the six-week healing process is to avoid chipping teeth. Acrylic also works well with people who are allergic to the metals mentioned above.

Two types of oral health complications can arise from tongue piercings. Acute complications can occur immediately after a piercing. Some examples are swelling of the tongue, pain, changes in speech, difficulty in swallowing and mastication, and allergic reaction to the metals. Chronic complications include fracturing of the teeth and restorations, pulpal damage, trauma to the gingiva, localised tissue overgrowth, bifid tongue, persistent difficulties in oral functions, and swelling of the piercing or parts.

Blood borne infections are also cause for concern. If the needle is contaminated, the person getting the piercing can contract HIV and hepatitis. New and sterile needles should always be used when getting a piercing. Piercing guns cannot be sterilised completely, which is why it is important that a needle be used instead of a piercing gun. More serious complications can also occur. While it is rare, there is the risk of obtaining Ludwig’s angina, a bacterial infection on the floor of the mouth, or endocarditis, which occurs when bacteria passes through the piercing hole into the bloodstream and infects the heart.

According to the National Electronic Injury Surveillance System of the U.S. Consumer Product Safety Commission, about 24,459 oral piercing injuries were presented to United States emergency departments from 2002 through 2008. Some of the injury percentages were lips (46%), tongue (42%), teeth (10%), infections (42%), and soft-tissue puncture wounds (29%).

Keeping Piercings Clean
Cleansing methods vary with each piercing. Saline solutions are available over the counter, preferably wound-washing vs. contact solution. Instructions recommend warming the saline solution and using a pad to dab the solution onto every side of the piercing site. Sea salt soaks are another method of cleansing. The technique for this is to boil 250 ml water and put one quarter teaspoon non-ionized sea salt or rock salt into the boiling water and mix. Once the mix is warm, swish for 15 to 30 seconds, two or three times a day.

Non-alcohol-based mouthwash is the best option for smokers. They can carry a small bottle around and swish after each cigarette.

Cleaning the piercing is a basic step in the healing process. Yet over-cleaning is a possibility when caring for a new oral piercing. If a patient presents with a white/yellow-coated tongue, the hygienist can make recommendations based on which method of cleansing they are using. Too much salt, the wrong type of salt, and too frequent use of mouthwash can cause a white/yellow-coated tongue.

Patients should be encouraged to refrain from touching the piercing unless they absolutely have to, and in that case, to wash their hands first and only touch the piercing while cleaning the site.

After the piercing is healed, it is imperative that it be scrubbed daily with a soft-bristle brush to prevent biofilm build up, especially on the ventral side of the tongue.

Piercings and Dental Hygiene Appointment
Dental hygienists need to be aware and have a thorough understanding of oral piercings and their care in order to properly educate patients. It can be assumed that an increase in patients with oral piercings accounts for an increase in patients...
with oral piercing complications. Maintenance and cleaning of jewellery must be stressed at every dental appointment, as well as assessment of the oral cavity for adverse clinical manifestations of the piercing.\(^1\)

It is the obligation of the dental hygienist to inform patients about the warning signs of infection, care, and long-term effects of oral piercings.\(^8\)

Bacteria introduced into the mouth from daily activities have the potential to create an infection. Common warning signs of infection/rejection include yellow or green discharge from the piercing site, thickened tissue, sensitivity, pain, oedema, inflammation, abscess, bleeding, and low-grade fever.\(^6\) Instructions on how to care for an infected piercing include flushing the area with water, cleansing the area frequently, and in the case of severe symptoms, visiting an emergency room. Toxic shock syndrome can occur from an infected oral piercing and can be fatal, and patients should be made aware of this if they present with an infected oral piercing. Infection caught early is easiest to treat, so patients should be mindful of what to look for and how to correct the problem immediately.\(^11\)

Patients should avoid a few activities after receiving a piercing, such as swimming, drying the piercing inappropriately, sleeping on the piercing, applying makeup to the piercing site, and tanning. Swimming is not recommended because standing pools can harbour bacteria, and the harsh chemicals can irritate the piercing site. If swimming cannot be avoided, the patient should use a waterproof patch to ensure the area stays clean, and then wash the area thoroughly afterward. When drying, piercing patients should avoid using towels that can transfer lint to the piercing. It is recommended that they dry the area with air or pat the area with a fresh paper towel.

Sleeping on a labial or buccal piercing can cause irritation, migration, or rejection of the piercing. They might also catch on the pillow and be pulled out. Hygienists should suggest patients change pillow covers frequently to ensure a clean environment for the piercing. Makeup should not be applied to the piercing site, and if used should form a wide circle around the piercing to avoid irritation and infection.

Tanning should also be avoided because it can burn the skin and irritate the piercing, and the chemicals in tanning lotion can be harmful to the piercing.\(^3\)

**SIDE-EFFECTS OF HEALING**

Normal side-effects of healing include but are not limited to crusty, irritation, slight swelling, and bleeding. Bleeding is often the case with perforation of a lingual blood vessel, but can occur anytime during the healing process from touching, picking, drinking alcohol, or taking a blood-thinning pain reliever. Crusting is normal and should not be picked at; it should be removed only after it has been soaked in cleansing solution and becomes soft enough to avoid tearing the skin. Assessment of the patient’s diet can assist with this as acidic and spicy foods will cause discomfort and irritation.\(^12\)

Swelling of the area can be treated with an anti-inflammatory and ice; however, ice should not be used for longer than 15 to 20 minutes, and the wait is 45 minutes before icing again.\(^10\) If the swelling overcomes the piercing, the patient should return to his/her piercer to prevent further difficulties such as airway obstruction.\(^3\)

Smoking needs to be addressed at every appointment but is especially pertinent to patients with oral piercings. Hygienists should recommend they cut back on the number of cigarettes they smoke in a day but not to quit entirely until after the piercing is healed. This is suggested because smoking cessation side-effects include dry mouth and coughing, which could affect the healing of the piercing.\(^11\)

Long-term effects of oral piercings need to be stressed to patients as these will require time and money to correct. Damage to teeth is the most common long-term side-effect from oral piercings, such as chipping, tooth abrasion, and fracture of cusps. Local gingival recession is also common.\(^12\)

Overall, oral piercings can be a way for individuals to express themselves and enjoy their bodies. The history, types of oral piercings, complications, warning signs of infection, and dental professional obligations are all vital information for dental hygienists. It is important that patients be advised of the risks associated with oral piercings, and that hygienists guide patients on how to care of their piercings.\(^3\) Maintenance should be stressed as well as the warning signs of infection. Possible long-term effects will need to be addressed during the clinical exam.

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**REFERENCES**


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**RDH Tor Abner, Zulda Franco, and Bader Alqahthani**

received Bachelor of Science degrees in dental hygiene from the University of Southern Indiana.
More students are opting to sink their teeth into the restructured Oral Health Programme of the University of the Western Cape (UWC). This programme is located and managed within the Department of Oral Hygiene, Faculty of Dentistry.

A three-year Bachelor of Oral Health Programme was introduced in 2010 subsequent to the phasing out of the initial two-year Diploma programme and the add-on year that culminated in a Bachelor of Oral Health (BoH) degree.

The first cohort of students graduated from the new programme in 2012, and the number of BoH students has grown consistently in the past ten years, with 87 students enrolled in 2015 (BoH1=35, BoH2=25 and BoH3=27). Of interest is the changing gender profile, with 14 males currently enrolled in the programme. Departmental staff includes six fulltime and three part-time oral hygiene lecturers and a secretary.

“a feature of the Oral Hygiene Programme is networking and engaging with partners to enhance the educational experience of students. Partnerships with commercial dental companies allow students and staff exposure to a range of dental educational material and products at appropriate milestones in the curriculum,” says Rugshana Cader.

During this process, students receive samples of products for their personal use, allowing them to experience and get a sense of the various kinds of products available for recommendation to their patients. Dental companies also provide educational material and products that students use during service learning activities as well as in treating and advising their patients.

Johnson and Johnson (J&J), which has a longstanding collaboration with the department, provided all students in the programme with clinical scrubs. Mrs Barbara van Wyk from J&J engaged with every group to enlighten them on self-care products and provided each student with samples and a set of clinical attire.

The UWC also hosted a REPS Day for the final year oral hygiene students where they had the opportunity to interact with dental representatives. During these events, the dental reps have carte blanche to address students on the latest developments in dental products, and educate them about the science and evidence behind the products. This platform creates an opportunity for students to meet and greet the dental representatives before they graduate.

Mr Louis Nel (now retired) from Oral-B met with the BoH1 students at the end of the first semester (2015) to discuss Oral-B’s self-care dental products. Information on the science of the products concerned was a useful introduction to the ‘prevention’ theme to follow in the second semester. Students received samples for their personal use as well as pamphlets for additional reading.

Oral-B provided every student and all fulltime Oral Hygiene Departmental staff with an automatic toothbrush. These students were exposed to a range of Oral-B products during their programme.
A DAY IN THE LIFE OF A DENTAL HYGIENIST

Emma Coulter

I have the privilege of working in a dental practice with two specialists: Dr Emil Langenegger, a periodontist, implantologist and oral medicine practitioner; and Ian Grundlingh, a prosthodontist. There is never a dull moment when you work for two inspiring specialists who are as passionate as you are about making a difference in people’s lives through dentistry.

My job requires that I be adept at all functions covered by the oral hygiene scope of practice (excluding orthodontics).

At the start of each day I examine the day sheet and make patient-specific notes as it is fundamentally important to be aware of each patient’s medical, dental and social history to allow for appropriate preparation for his/her appointment. Most of the time, the patient has been through so much dentally and emotionally that he/she is very apprehensive to meet a new face. Plus, with such a wide variety of treatments on offer by the practice, I need to ensure that I implement the best evidence-based management protocol to accommodate patient needs. It is therefore necessary that I know which treatment has been provided and how I form part of the bigger picture of each patient’s treatment plan. It is also important that the patient knows that you have a vested interest in their holistic dental health.

During treatment I am always careful to ensure the patient’s back and neck are sufficiently supported and I apply lots of lip balm. It is a small gesture but patients really appreciate the small details. I also remove sutures once these have been in long enough or are no longer in function. This alleviates any discomfort, especially if loose and partially resorbed.

At the end of each appointment, I make notes on periodontal indicators and tooth-related concerns as well as what was important in each patient’s life or day. On recall I can talk to each patient about these important things so that they never feel that all I see is a mouth and not a whole person walking into my room. Patients love to get a chance to talk in the beginning so I give them time, since for the rest of the appointment you own the stage.

During the day, if I have any spare time, I assist wherever needed and sometimes give local anaesthetics pre-operatively for Dr Langenegger so that when he walks into the surgical environment the patient is ready for treatment. This takes pressure off the entire dental team.

If I have taken any impressions during the day I usually book time off at the end of my day to be able to cast them and ensure they have been done correctly before the impression distorts.

At the end of each working day I confirm that all my notes are up-to-date and patient recalls have been set up.

It provides a great sense of satisfaction to know I have done my very best for each and every patient. I look forward to learning from all of your stories in the future!

OHASA NEWS

NEWS FROM THE EASTERN CAPE BRANCH

The OHASA Eastern Cape branch had its first breakfast meeting on the 23rd of January 2016 at the Intercare Training Centre, Walmer, in Port Elizabeth.

We would like to thank Ivodent for sponsoring this meeting – you and the speakers at the event made this morning with its lively and interesting discussions possible.

One of the speakers, Dr Evert Burger, presented a periodontics-related lecture and our CPD Co-ordinator, Sanmarie Botha, spoke about the latest and favourite tools of our trade.

Members are reminded that our meeting dates for this year are 23 April and 10 September – save the dates! Both meetings will be at the Radisson Hotel in Summerstrand and all dental professionals are welcome to attend. Programmes and costs will be communicated later.
The OHASA Gauteng branch held its first seminar for 2016 on 6 February at 3M in Johannesburg. The theme for the day was unmistakable and heartily confirmed by both the programme and delegates.

The topical message – ‘OHASA Loves Green!’ – aimed to make the delegates more aware of how important it is to recycle and re-use in our daily lives so that we can conserve energy and ensure that the future generation has a cleaner environment in which to live and breathe. Everyone brought items that could be recycled, which were then collected by Remade Recycling, the largest independently owned operator and trader of recyclable material in South Africa.

Adding to the positive and beautiful atmosphere was the delegates who wore green and white showing their support in saving our earth. The seminar was well attended and we had the privilege of listening to Glynnis Vergotine, Dr Christina Strydom and Daveyrose Ralephenya.

The topics were:
1. Motivational interviewing in Oral Hygiene
2. Glass ionomers: Fascinating materials or not?
3. Microbial contaminants on dental bib chains with attached clips.

An informative tour of the Innovation Centre preceded the well-prepared brunch.

A big thank you to the following Dental Traders who supported us: 3M South Africa, GSK, Inova, Johnson & Johnson, Oral-B, Pharmco, Prime Dental and Teeth SA. We would like to extend a special thank you to 3M for always making its venue available for our seminars and other OHASA events.

The next event to diarise is the SADA Congress at Gallagher Estate in Midrand, Gauteng, from 19–21 March 2016. This is an event not to be missed. OHASA president and other OHASA members were able to give their input and we know that the topics promise to be very relevant and interesting, especially since SADA has secured some overseas speakers and professionals who are not always able to present at our seminars. We would love to have as many OHASA members represented there as possible, especially on Sunday, 21 March, when a special all-day Oral Hygiene Programme is scheduled.

The Gauteng branch wishes you all a great year ahead and we leave you with these words:

Laugh when you can,
Apologise when you should,
and let go of what you can’t change.
Life is too short to be anything but happy.

(Author unknown)
OHASA Western Cape had a very successful 2015, starting with our annual breakfast meeting on the 21st of February 2015 at the scenic Royal Yacht club on the Foreshore. We had the privileged to listen to an aroma therapist who enriched our delegates’ minds with her experience in the field and how we can use that in our profession and own life.

Our first full-day seminar followed on the 18th of April 2015 at the UCT medical school where we built our knowledge on oral manifestations and management of substance abuse patients, the caries risk assessment tools, and the epidemiology of mental health in South Africa. Our OHASA president, Stella Lamprecht, joined us in Cape Town and presented on the topic ‘Congratulations you have your degree – what now – professional responsibility’.

We ended the year with our last full-day seminar on the 24th of October 2015 at the UCT medical school. At this seminar we also had the great pleasure to thank a very good friend of OHASA, Louis Nel from Oral-B, who retired after more than 40 years in the industry. We thanked Louis for his support throughout all the years and wished him all the best on his well-deserved retirement journey.

One of our Western Cape branch committee members started a fantastic initiative – a blanket drive – at our full-day seminars. We collected blankets during the first seminar for those facing the cold winter nights without a shelter. This initiative was well supported by all the delegates. At the last seminar, one of the Western Cape members suggested we collect sanitary towels for unprivileged school girls in the Western Cape. Both these drives were supported by the Oostenberg Rotary Club who collected all the items and distributed it where needed.

What is an OHASA seminar without the loyal support of our sponsors and exhibitors? We as OHASA Western Cape would like to thank our 2015 sponsors and exhibitors: Oral-B, Colgate, GSK, J&J, Pierre Fabre, Orthoshop and Ivodent.

On behalf of myself, Gail Smith, the branch and CPD committee, I want to thank OHASA Western Cape members for their loyal support and look forward to 2016 where all members will support and help us in making the Western Cape branch a dynamic branch.

NEWS FROM THE

KWAZULU-NATAL BRANCH

SEMINAR DATES 2016

OHASA KZN will have two full-day seminars this year on 21 May and 23 October. The seminars will be held at the Balmoral Hotel in Durban and delegates will receive eight CPD points. A finalised programme will be sent to OHASA members soon. We will also be involved in some community outreach programmes this year.

Any OHASA KZN members wishing to participate are welcome to contact Maggie on 0837779421 or ohasa.kzn@gmail.com.
GENERAL

A perspective on the dental assistant judgment

1. One does not need to be registered with the HPCS in order to legally practice the job of dental assisting in any sector of the South African economy.
   a. True
   b. False

2. To found its case, SADA cited the Health Professions Act, the Promotion of Administrative Justice Act and the Constitution in support of its application for judicial review.
   a. True
   b. False

3. Administrative justice as a construct is about:
   a. Protection against the abuse of state power
   b. Public participation in decision-making
   c. Fairness in administrative dealings
   d. a and b
   e. a, b and c

4. SADA argued that the Minister of Health was not entitled to promulgate regulations in the absence of a register for dental assistants and that a register had to be created in order for the profession to be created.
   a. True
   b. False

5. DAASA devoted much of its time and effort over a long period of time for the regulation of the job of dental assisting.
   a. True
   b. False

Antiseptics as chemical adjuncts to mechanical plaque control in oral care

6. Chronic sustained inflammation is marked by an increased production of pro-inflammatory cytokines that results in local tissue damage and creates an inflammatory cascade.
   a. True
   b. False

7. Effective plaque control must aim at:
   a. Reducing bacterial adherence by increasing bacterial or surface charge
   b. Reducing bacterial hydrophobicity
   c. Changing enamel surface hydrophobicity
   d. All of the above
   e. None of the above

8. Second generation oral antiplaque mouthwashes have the ability to remain active for up to several hours after use.
   a. True
   b. False

9. If a good antiplaque action is to be anticipated, the patient should twice daily rinse with 15 ml of a 0.12% solution of CHX.
   a. True
   b. False

10. Listerine composes of three essential oils namely menthol, eucalyptus and methylsalicylate.
    a. True
    b. False

11. The clinical indications of a chemical antiplaque agent are:
    a. Following oral surgical procedures where hygiene is more difficult and the need to control plaque is more important
    b. As an adjunct to mechanical plaque control during the active phase of periodontal therapy
    c. In limiting bacteremia and bacterial aerosol following the use of dental instrumentation
    d. a and c
    e. a, b and c

Entrepreneurial knowledge and aspirations of dentistry students in South Africa

12. Entrepreneurship in developing economies is seen as an engine of economic progress, job creation and social adjustment.
    a. True
    b. False

13. An entrepreneur is a person who sees opportunity in the market, gathers resources and starts and sustains or grows a business venture to satisfy these needs. Entrepreneurs accept the risks associated with the venture and are rewarded with the financial profits if it succeeds.
    a. True
    b. False

14. Cultural capital, in terms of access to finance and economic capital, in terms of knowledge, skills and attitude, are critical with regard to the decision-making process in starting up a business.
    a. True
    b. False
15. The following objectives should be achieved through entrepreneurship education:
   a. Encouraging innovative business start-ups
   b. Improvement of individual roles in society and the economy
   c. Improvement of the entrepreneurship mindset of young people, to enable them to be more creative and self-confident in whatever they undertake and to improve their attractiveness for employers
   d. b and c
   e. a, b and c

16. In South Africa, a developing nation, the ratio of business owners to employees is approximately 1 to 52 whereas in most developed countries it is 1 to 15.
   a. True
   b. False

17. A perceived lack of relevant experience and a lack of self-confidence are two reasons often cited for new graduates not engaging in entrepreneurship soon after graduation.
   a. True
   b. False

18. Fewer females indicated an interest to start an own business and this could be due to an observation that women generally may have a lower risk propensity and are therefore more cautious when it comes to starting a business.
   a. True
   b. False

19. Dentistry students are required to undertake one year of internship at a state institution and this may deter them from starting their own business practice because they become accustomed to being employed early in their careers.
   a. True
   b. False

20. Surgical steel is a common metal used for tongue rings but other materials such as titanium, 14 carat gold and acrylic can also be used.
   a. True
   b. False

21. Acute complications after a tongue piercing could be as follows:
   a. Allergic reaction to the metal
   b. Bifid tongue
   c. Difficulty in swallowing and mastication
   d. a and b
   e. a and c

22. Common warning signs of infection/rejection of an oral piercing include:
   a. Low-grade fever
   b. Yellow or green discharge from the piercing site
   c. Thickened tissue
   d. a, b and c
   e. b and c

23. Patients should avoid activities after receiving a piercing such as swimming, sleeping on the piercing and applying makeup to the piercing site.
   a. True
   b. False

24. Bleeding after a piercing is often the case with perforation of a lingual blood vessel but can occur any time during the healing process from touching, picking, drinking alcohol or taking a blood-thinning pain reliever.
   a. True
   b. False

25. Oral piercings can be a way for individuals to express themselves and enjoy their bodies. However, the long-term effects of these piercings need to be stressed to patients as these will require time and money to correct.
   a. True
   b. False

Taking care of piercings: Dental Hygienists should advise patients about risks and safety associated with oral piercings

26. Vasoconstrictors are added to local anaesthetics agents to counteract the vasodilatory properties thereby decreasing absorption and resulting in reduced risk of systemic toxicity.
   a. True
   b. False

27. Epinephrine and levonordefrin are two examples of vasoconstrictors and the difference between the two is that epinephrine is one-sixth as potent as levonordefrin.
   a. True
   b. False

28. Mepivacaine has a milder vasodilatory effect than most other amides and therefore useful with patients for whom vasoconstrictor is contraindicated and cannot receive 4% prilocaine plain.
   a. True
   b. False

29. Articaine gives lower injection rates related to increased lipid solubility and slower diffusion through hard and soft tissues, including palatal root anaesthesia with buccal injections and mandibular anaesthesia with supraperiosteal injections.
   a. True
   b. False

30. Paraesthesia is most often related to mechanical trauma and not chemical trauma because the lingual nerve is in the path of the sharp dental needle during provision of the IA block.
   a. True
   b. False
New LISTERINE® Advanced White
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- Helps prevent new stains forming
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1. Phargel® Package Insert Approved February 2012.