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The beginning of every New Year brings with it a slew of New Year resolutions. "I am going to lose weight", "I am going to stop smoking", "I am going to stress less" etc., etc. It was no different for me. As 2016, drew to a close and the dawn of 2017 broke on the horizon, I too had my resolutions. I had just completed and graduated with my MSc in Dental Public Health (UWC) and I was looking forward to spending time with my family who so unselfishly supported my studies. I wanted to catch up with friends over coffee, and yes, I wanted to binge watch series on TV!

As I write this, I want you, my friends and fellow professionals, to know that I no longer plan too far ahead. I now live by the maxim “Do it NOW!” Don’t delay, act; don’t exist, live. Allow me to share my recent journey with you...

I am reasonably active, healthy, mother of two wonderful young men and wife to my life partner. Oral healthcare is my passion, my family says it’s actually my life (I don’t tell them that they are right!). I gym regularly, we are blessed to go on holiday as a family, and I have completed my Master’s. Life is not always a bed of roses, but I was ready to smell the coffee and allow myself more time with the family. However, on the 2nd of January 2017, I collapsed with a seizure in my kitchen. I do not suffer from epilepsy and truth be told, I very seldom even suffer from a headache. I had never ever had a seizure before. I suffered a second seizure 40 minutes later. My family rushed me to hospital. An MRI scan revealed that I had a 7 cm tumour on my brain. It needed to be removed as it was applying undue pressure to my brain, and I very seldom even suffer from a headache. I had never ever had a seizure before. I suffered a second seizure 40 minutes later. My family rushed me to hospital. An MRI scan revealed that I had a 7 cm tumour on my brain. It needed to be removed as it was applying undue pressure to my brain. The condition is called meningioma. An excellent surgeon removed the tumour during a six hour operation and histology results confirmed that the tumour was benign.

So, after a two-week stay in hospital, I am back home, and on the road to full recovery. It hasn’t been easy. The pain and discomfort have somehow been easier to deal with than my perceived loss of independence. I am so grateful to everyone who helps, but it has been difficult for me to realise that, at this moment, I cannot do everything by myself. I am not allowed to drive yet, I cannot go out for long periods of time, I have not even been able to binge watch TV… Truth be told, I felt helpless and vulnerable.

And so I sit at the big window in our lounge that overlooks the ocean, with my shaven hair and deep scar across my head. I sit, reflective and ruminative. I reflect on what had happened to me. I never question why it happened, but I reflect on this life-changing experience and I ruminate on lessons learnt.

There are two primary lessons that I have learnt that I wish to share. I don’t wish to preach or come across in any sanctimonious way — this has honestly simply been my experience. The first lesson is that of GRATITUDE. Be grateful for everything, no matter how much or how little we may have. Be grateful to and for family. We all have issues within our families, but rest assured that they are the ones who will take care of us in our hour of need. Be grateful for friends for their love and support, because they will lift you when you feel down. Be grateful for small mercies. Be grateful at times of triumph and in times of adversity. Be grateful.

The second lesson I have learnt is to live NOW! How easy is it not to put things off, to do it another time, at a later date? Why didn’t I sit and enjoy TV, why didn’t I go for coffee with friends more often? Why? Because there was always a “next time”. But what if there isn’t a “next time”? It would have been valuable time spent in the pursuit of WHAT exactly? Name, fame, status, eternal youth? Does it really matter that much? And this is ultimately the point I want to make to my fellow health professionals – there are so many enrichment programmes, personal and professional, happening around all of us — enrol NOW. For example the Bachelor of Oral Health has the expanded scope of functions to enrich yourself. Register NOW so that we as oral health practitioners can be better for our patients. It is fear and apathy that stops you from enrolling. On the other hand, if there is a course in quilting, sewing, or designing that you’ve always wanted to take, do not leave it till next year. All these courses are designed to make all of us a better “me”. Do not be saddled with regrets, and “maybe” and “if only’s”. The time is NOW — to do now, to act now, to live now, to be all that we can be NOW… Truth be told, we might not get another chance.

Yesterday is forever gone, it is the past. Tomorrow is not promised to anyone, it is the future. Today is a gift, treasure it, that is why it is called the present.

In closing, I want to thank the entire OHASA family for their prayers, love, support and well wishes during this challenging time. Your concern speaks volumes of your character and person. Let’s make 2017 great for everyone!! Keep smiling… ●
Dear OHASA members and colleagues!

Wishing you a blessed and prosperous 2017. This year has already presented us with some new challenges, and on behalf of the OHASA members we wish Rugshana a speedy recovery, you will be kept in our thoughts and prayers. In terms of the Journal, if any of the members have relevant articles that they think would be interesting, please submit them as this will greatly help the editorial staff. Please email these to Anri Bernardo at ohasawc@gmail.com. Anri will be Rugshana’s right hand for the time being, and OHASA thanks her for stepping up during this time.

DPL fees for 2017 is R1 810 and I urge all members to subscribe. OHASA fees are due on 28 February 2017 and forms can be downloaded from the OHASA website – www.ohasa.co.za. Please note there is an administration fee of R220 for oral hygienists and R150 for allied members if paid after 28 February.

The Health Professions Council of South Africa (HPCSA) will be launching their new interactive website on 1 March 2017, therefore the fees for 2017/18 have not yet been published. The new website, as stated above, will be interactive and practitioners will be able to pay their fees via the website. Practitioners wishing to take voluntary erasure must have submitted an affidavit requesting voluntary erasure, and the relevant forms can be downloaded from the HPCSA website. No voluntary erasure will be accepted without this form being submitted. Voluntary erasure must be completed before 31 March 2017 and practitioners must ensure they have received acknowledgment of the request. If you would like to be restored to the register at a later stage, then these documents will be needed; as such please safeguard the necessary.

OHASA’s annual fees to the International Federation of Dental Hygienists (IFDH) has been paid and we urge you to visit the website as they will be hosting webinars for IFDH members. The IFDH has decided to host a social responsibility workshop and two delegates from each member country have been selected to attend the workshop in Florence. After careful consideration and deliberation the OHASA executives have selected Ms Maggie Naidoo and Ms Natalie Gordon to represent South Africa. Maggie and Natalie will attend the conference/workshop during May 2017, and on completing the workshop will proceed to implement the social responsibility programmes here in South Africa. We look forward to their feedback in our 3rd quarter Journal.

Bankmed has contacted Christine De Sousa in connection with introducing oral hygiene into their wellness programmes. OHASA and Oral B, together with Christine, have partnered up to be actively involved in these programmes. To this end we will be contacting members to take part in specified wellness days in their respective areas. Compensation will be provided for work done. We as oral hygienists need to take this opportunity to create oral health awareness, as we all know oral health is a vital link to a healthy body – prevention is better than cure.

Cleanition™ has contacted me for an opportunity to introduce their products and we will be featuring their scientific articles published in this regard in one of the Journals this year. Dental hygienists throughout the USA, Canada, UK and Europe have successfully implemented the use of these products amongst HIV, oncology and geriatric patients. A survey will be completed after you have read the articles to see whether this will be a viable project.

Finally, I need all the members’ suggestions on possible candidates for the new Exco as the current Exco and Branch Committee’s terms will be coming to an end in November 2017.

Wishing our traders a wonderful and blessed 2017. Thank you for your loyal support and we are looking forward to another successful year.

God Bless
Stella

Stella Lamprecht
OHASA president
As an oral hygienist, with a background in medical anthropology, I am interested in how people from other cultures deal with their (dental) health. I am especially fascinated by the phenomenon of dental or oral modification.

Dental modification, also known as dental mutilation, was once widely spread amongst different cultures around the world. Though not as prevalent as in history, it is still practiced in some ethnic groups in Africa today (Barnes, 2010). The Maasai from Kenya are known to extract their lower central incisors (Grasveld, 2014) and part of the coloured community in Cape Town is famous for their ‘Cape Flats Smile’, the extraction of the four front teeth1 (Van der Ham, 2013). Dental modification, often executed by traditional healers, has social implications, but also comes with the risk of pain, infection and, in rare cases, death (Barnes, 2010; Graham, 2006).

The position of the mouth and the teeth in the centre of the face makes it, in all cultures, important to the appearance (Exley, 2009). The mouth has social value and influences how other people react to you (ibid.). However, there is a gap in anthropological or sociological literature about oral health (Exley, 2009; Grasveld, 2014). In dentistry there is also little interest in the influence that culture has on the way people treat their teeth. Therefore I asked both a dentist and a medical anthropologist how the other discipline could compliment their own. These were their answers:

On the one hand, dentistry could benefit from an anthropological perspective because medical anthropology studies the social and cultural aspects of medical (and dental) diseases. Anthropologists conduct research into the meaning and influence of dental and periodontal issues on someone’s life. An anthropologist is able to build rapport with people from different cultures and social backgrounds and to look at certain issues from their perceptions. Therefore anthropologists are able to ask important questions on behalf of dentists. Furthermore, the anthropologist can give recommendations for the improvement of dental care in different socio-cultural settings. With that specific knowledge, dentists can tackle dental problems in foreign communities more effectively and efficiently. When oral health improves, Oral health-related quality of life2 and health-related quality of life3 will also improve.

On the other hand, the knowledge of dentistry is also complimentary for anthropology. Anthropological literature about the mouth and oral cavity is almost nonexistent, although dental and oral modification has been around for a long time and is an important way to express culture. There are four forms of dental modification: dental ablation, filing, drilling with inlays and staining (Barnes, 2010). Dental or oral modification can be performed as a sacred (initiation) ritual, a rite of passage, for aesthetic purposes, a means of identifying with the kin or village group, establishing a self-identity within the group, for practical reasons, because of peer pressure or because of medical reasons (Grasveld, 2014; Barnes, 2010), all fascinating topics for anthropologists.

Therefore, I argue that the social sciences, as well as dentistry – and in particular dental volunteer programmes – could benefit from a discipline called ‘Anthropology of Oral Health’ (Grasveld, 2016). Before one can change certain behaviour, one needs to understand the cultural ideas behind it.
Bone. It is most often accompanied by gingivitis. Bone, progressing to actual loss of the supporting tissue to both the gingiva and the periodontal ligament. It is characterised by a gradual loss of attachment of the periodontal ligament to both the gingiva and the bone, progressing to actual loss of the supporting tissue to both the gingiva and the bone as measured by radiographs. The most common form of adult periodontitis is the destruction of supporting tissue can cause loosening and even loss of teeth, increases with age. The most common form of adult periodontitis is the destruction of supporting tissue can cause loosening and even loss of teeth, increases with age. The most common form of adult periodontitis is the destruction of supporting tissue can cause loosening and even loss of teeth, increases with age. The most common form of adult periodontitis is the destruction of supporting tissue can cause loosening and even loss of teeth, increases with age.

The severity of periodontal disease is determined through a series of measurements, including the extent of gingival inflammation and bleeding, the probing depth of the pocket to the point of resistance, clinical evidence of attachment, loss of the periodontal ligament and the loss of adjacent alveolar bone as measured by radiographs. Severity is also determined by the rate of disease progression over time and the response of the tissues to treatment. The prevalence and severity of periodontal disease increases, but does not accelerate with age. The current view is that the disease process may not be continuous, but rather progresses in random bursts in which short periods of breakdown of periodontal ligament and bone alternate with periods of quiescence. These episodes occur randomly over time and at random sites in the mouth. Part of the difficulty in determining the pattern of progression reflects variation in the sensitivity of the instruments used to measure the loss of soft tissue and bone.

While there is no doubt that the existence of bacteria plays an important role in the aetiology of periodontal disease, studies suggest that it is the combination of the presence of these bacteria and the host response of the individual that determines the development and rate of progression of periodontal disease. Thus the main risk factors of the disease are often outside the control of the clinician. In addition, the levels of periodontal disease can manifest by years of quiescence and occasional bouts of sporadic activity. Radiographic evidence did not show any major deterioration until the final visit and when a second opinion was required, she was referred to a specialist.

In many cases, the levels of periodontal disease in a patient’s mouth are due to factors beyond the dentist’s control and do not reflect any fault or the part of the dentist. However, it is easier to demonstrate that a high standard of care was provided, if dental records are comprehensively written up. The table highlights key issues that need to be documented during the management of patients with periodontal disease. (See table below).

A dentist who is able to communicate effectively and compassionately is able to dissipate fear and allay anxiety. This, in turn, leads to better patient satisfaction and to better treatment adherence. Research has demonstrated a relationship between communication skills and complaints lodged against oral health care workers. Dentists who...
focus on technical procedures or technology, who spend little time talking to patients and who give minimal explanations to patients are at higher risk of litigation. Risk of litigation appears to be related to “patients’ dissatisfaction with their physicians’ ability to establish rapport, provide access, administer care and treatment consistent with expectations and communicate effectively”. It is worth taking the time to schedule a face-to-face conversation with patients to discuss complex disease like periodontal disease. Such communication goes a long way to encourage the patient to ‘internalise’ the problem, take responsibility and, importantly, to adhere to oral hygiene instructions and oral health education messages. 

Table 1: Clinical Audit For Patients With Periodontal Disease

| History | A written medical history has been taken and updated at regular intervals. Systemic diseases and known risk factors for periodontal disease (smoking, diabetes) have been identified and recorded. |
| Assessment | A full assessment of periodontal status of the teeth including radiographic assessment to gain a clear idea of any bone loss or pathology and to foresee any problems that may arise. |
| Screening | Appropriate screening (e.g. PBE scores, bleeding when brushing) and follow-up investigations (e.g. x-rays). |
| Diagnosis | Establish a clear diagnosis and discuss the treatment objectives with the patient prior to commencing periodontic therapy. |
| Consider alternatives | It is important to consider periodontal treatment as part of the long-term treatment needs of the patient and to consider alternatives that may including extraction of mobile teeth. |
| Patient information | The patient has been informed of the presence of the disease, given specific information regarding the site(s) and severity generally, and warned in respect of any specific teeth that have an unfavourable prognosis. The patient has received suitable advice/instructions regarding oral hygiene, risk factors (e.g. cessation of smoking) to enable the patient to become personally involved in the control of their periodontal disease. |
| Meticulous measurements | Follow-up measurements of the site(s) and severity of the disease must be made (BPE scores, probing depths, bleeding points, mobility, pathological changes affecting individual teeth). |
| Initial management | Appropriate levels of initial treatment (scaling, root planning) have been carried out and repeated at suitable intervals. All techniques and procedures used should be evidence-based where possible. |
| Patient compliance | Any failure on the patient’s part with respect to compliance (oral hygiene, risk factors, irregular attendance) has been brought to the patient’s attention and the importance stressed. |
| Review after treatment | The tissue response and patient compliance have been checked and further measurements/monitoring of progression of the disease has taken place. |
| Monitoring | Records must show that monitoring was been repeated at appropriate intervals, with the necessary x-rays and other investigations. |
| Failure to keep appointments | Any occasion when the patient has failed to attend appointments, has cancelled appointments at short notice, or does not respond to reminders or recall letters. |
| Failure of treatment | In cases of severe, complex periodontal disease where the patient has not responded to the advice and treatment provided, it must be shown that the possibility of a referral for specialist advice has been considered and discussed with the patient. Full documentation must be recorded if the patient declined such a referral for any reason or if there was any occasion when the patient declined treatment that was recommended. |
| Follow-up | Follow-up is essential, especially if there were any problems during treatment. |

(Adapted from DPL Riskwise South Africa #10 2006)

REFERENCES
A REVIEW OF THE EPIDEMIOLOGY AND AN UPDATE OF INFECTION CONTROL RECOMMENDATIONS FOR TUBERCULOSIS

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(Sourced from: SADJ, November 2010, Vol. 65, No. 10, pp 462–469)

ABSTRACT
Tuberculosis is the world’s leading cause of death from a single infectious agent. The World Health Organization has declared the disease a “global emergency”. TB is a major public health problem in South Africa. In 2007, the WHO ranked South Africa fifth among the world’s 22 high-burden TB countries. The TB epidemic in South Africa is likely to get worse over the next few years due to the high prevalence of HIV/AIDS. Extrapulmonary presentations make up a major proportion of new cases, especially since the acquired immunodeficiency syndrome epidemic. Therefore, it is important that oral healthcare workers are aware of tuberculosis in the head and neck region and its varied manifestations, to enable early diagnosis and commencement of appropriate treatment.

M. tuberculosis is hazardous to oral healthcare workers because of its airborne route of transmission, lack of effective vaccination, the long and tedious treatment regimen, presence of resistant strains and the long-term sequelae of the infection. TB infection control policies and protocols for implementing these control measures should be included in a dental setting’s overall infection control programme, and should be reviewed annually.

Key words: Tuberculosis, HIV, oral healthcare workers, infection control

INTRODUCTION
Tuberculosis (TB) is a highly infectious, debilitating disease that typically involves the pulmonary system, but can affect any organ or tissue, including the mouth. While TB notification rates continue to decrease in many parts of the world, rates have increased more than three-fold in many countries in sub-Saharan Africa since 1990, fuelling a 1% increase in global TB incidence. In 1993, it was the world’s leading cause of death from a single infectious agent. The World Health Organization (WHO) declared the disease a “global health emergency”.

Globally, TB remains one of the leading causes of death resulting from infectious disease. Mycobacterium tuberculosis (M. tuberculosis) is thought to infect an estimated 2 billion people (one-third of the world’s population). In 2007, approximately 9.27 million new cases of TB developed, and 1.78 million people died. In 2007, Africa made up 55% of the estimated number of cases, and South Africa ranked fifth in terms of total number of cases (0.46 million). Of the 9.27 million new TB cases in 2007, an estimated 1.37 million (15%) were human immunodeficiency virus (HIV)-positive and 79% of these HIV-positive cases were in the African region, and South Africa accounted for 31% of these cases. Thirteen of the 15 countries with the highest estimated TB incidence rates were in Africa, a phenomenon linked to high rates of HIV co-infection.

In 2005, the African continent, with just 11% of the world’s population, accounted for 27% of the global burden of TB and 30% of TB-related deaths. Over 2 million new TB cases and over 500 000 TB-related deaths are estimated to occur in the region annually. Factors that influenced the resurgence of the disease included the emergence of multidrug-resistant (MDR) organisms, social deprivation (injection drug use, homelessness, poverty), the increasing population of young adults that constituted the majority of the infected subjects, immigration from endemic areas, deteriorating healthcare infrastructure and the Acquired Immune Deficiency Syndrome (AIDS) pandemic.

About a third of the world’s population (about 2 billion people) carries the TB bacteria, but most never develop the active disease. Around 10% of people infected with TB actually develop the disease in their lifetime, but this number is increasing due to HIV that severely weakens the human immune system and makes people more vulnerable to infections.

The impact of HIV on the TB epidemic is potentially catastrophic. HIV increases the susceptibility of the HIV-positive person to TB. The advent of HIV has resulted in 5–10% annual risk of developing TB, as compared to 5–10% lifetime risk of TB infection in people without HIV. About 50% of TB patients in South Africa are infected with HIV. Nosocomial transmission of TB among HIV-infected individuals is a major hazard, as was illustrated by the outbreak of extensive drug-resistant (XDR) TB in KwaZulu-Natal in 2006.

Tuberculosis infections are acquired by inhalation of the tubercle bacilli that are presented in airborne particles. TB of the respiratory tract is the most infective form. Prior to the HIV epidemic, 85% of reported TB cases were limited to the lungs. This has now changed, particularly in HIV-infected individuals as extrapulmonary TB tends to increase in frequency if immune function is compromised.

With the decrease in the general incidence of head and neck involvement to a point where it was taken as a rare finding, clinicians were not ‘sensitised’ to the head and neck manifestations as part of a differential diagnosis. This has often resulted in a delay in diagnosis and therapy, or the diagnosis being missed entirely. After a decline for several decades, the incidence of mycobacterial disease as a whole, and the extrapulmonary type in particular, is on the rise in many regions in the world. TB often presents in the head and neck, with the cervical lymph nodes being one of the commonest sites of extrapulmonary TB. Other head and neck manifestations may also present in the oral cavity, nose, ears, larynx, thyroid and salivary glands, but these locations are rare.

M. tuberculosis is uniquely hazardous to oral healthcare workers because of its airborne route of transmission. The resurgence of TB as a public health problem has rekindled interest in the disease among oral healthcare workers. However, much research has focused on pulmonary and extrapulmonary TB...
TUBERCULOSIS IN SOUTH AFRICA

TB remains the most important communicable disease in the world, and in South Africa it accounts for 80% of all notifiable diseases. The annual number of new cases averages 380/100 000 population – even in other hard-hit parts of the world the average is only about 200/100 000.

The TB epidemic in South Africa is one of the worst in the world, and in some impoverished parts of the country it has the fastest growing epidemic than anywhere else in the world. Nearly two-thirds of the population in the country is infected with TB, 160 000 South Africans from all walks of life become ill with TB every year, and about 10 000 people die of TB every year. Poorer communities are at greater risk of exposure to both acute and chronic TB infection.

TB is a major public health problem in South Africa. In 2007, the WHO ranked South Africa fifth among the world’s 22 high-burden TB countries. The TB epidemic in South Africa is likely to be exacerbated over the next few years due to the high prevalence of HIV/AIDS. TB-HIV co-infection rates are high, with as many as 60% of adult TB patients being HIV-positive. MRD TB, largely caused by non-adherence to drug regimens or inappropriate drug regimens, is further exacerbating the epidemic. National studies of MDR-TB conducted by the Medical Research Council of South Africa in 2002 found that 16% of new TB cases and 6.7% of re-treatment cases had MDR-TB.

The proportion of people with extrapulmonary TB has also trebled, but appears to have stabilised at around 15%. Despite a global slowing down in new TB cases since 2003, South Africa recorded the world’s second highest rate of new cases (incidence rate) in 2006 after Swaziland. The WHO report in 2006 revealed that 218 people per 100 000 died of TB in South Africa. This was more than in any other country in the world. The problem of TB in South Africa is largely a result of historical neglect and poor management systems, compounded by the legacy of fragmented health services.

In South Africa, attention has been refocused on the factors associated with the observed reversal of previous declining disease trends, transmission modes of M. tuberculosis, occupational risk factors and airborne infection control precautions. Despite dramatic improvements in public health measures associated with M. tuberculosis infection and disease, such as living conditions, nutrition, and antimicrobial chemotherapy, TB remains a major public health problem for much of the world’s population.

HIV AND TB CO-INFECTION

The impact of HIV on the TB epidemic has been catastrophic. HIV increases the susceptibility of the HIV-positive person to TB. TB is 500 times more common in HIV-infected people than in the normal population. More than three quarters of affected patients develop extrapulmonary disease. Of the 36 million HIV-infected persons in the world, one-third are co-infected with M. tuberculosis and 75% of these people reside in sub-Saharan Africa. Latent infections present in HIV patients have a 7–10% annual risk of reactivation compared to a 5–10% lifetime risk in an HIV-uninfected patient. They have a 10–20% chance of acquiring TB from an open contact, compared to 5–10% in a non-HIV patient and a 30–40% chance of developing progressive primary disease as compared to 5–10% in a non-HIV individual. More than 60% of HIV-infected patients can develop disseminated military or extrapulmonary disease compared to less than 25% in non-HIV patients. The escalation in TB cases in sub-Saharan Africa is largely attributable to the explosive HIV epidemic. The annual new case (8 million) and death (2 million) rates in sub-Saharan Africa are expected to continue to rise.

A weakened immune system allows for dissemination of the bacteria to areas other than the lungs, which explains the increased likelihood of extrapulmonary TB among HIV-positive individuals.

Experienced clinicians in central Africa have noticed a change in the pattern of the disease. Patients produce no sputum or have negative sputum smears, little change in chest radiography, or there may be diffuse pulmonary infiltrates without cavitation. Extrapulmonary disease appears to be more common – especially in forms where they were previously uncommon. The change in disease pattern has made diagnosis of TB more difficult. Extrapulmonary TB can be difficult to diagnose and differentiation from neoplastic or other inflammatory conditions can be difficult, particularly in mucosal TB involving the larynx, hypopharynx and nasopharynx.
In view of the high frequency of non-cavitary pulmonary disease and extrapulmonary forms of TB, sputum smear microscopy has a low sensitivity for diagnosis. Sensitivity is substantially increased by sputum culture, but this is slow and expensive and the necessary infrastructure is not available over much of Africa.  

TB, which can occur at any time during the course of HIV, most often occurs early in the disease and probably accelerates the progression of the HIV disease. The WHO Directly Observed Treatment Short Course (DOTS) strategy remains the central component of global TB control strategies. However, while successful in low HIV prevalence settings, this strategy alone has proven insufficient to contain the African TB epidemic in high HIV prevalence countries.  

**HEAD AND NECK MANIFESTATIONS OF TB**

Head and neck TB can present in many forms, depending on the site of involvement, the stage of the disease and the immune status of the patient. Head and neck TB forms nearly 10% of all extrapulmonary manifestations of the disease. Therefore oral health professionals need to be aware of TB in the head and neck region and its varied manifestations. The cervical lymph nodes are one of the commonest sites of extrapulmonary TB. Other sites include the oral cavity, nose, ears, larynx, pharynx, thyroid, salivary glands, eye, cervical spine and mandible.

**Cervical lymph nodes**

The cervical lymph nodes are the most common site in the head and neck region to be affected by TB. The presentation could be an isolated, discreet, affected node, or the more common collection of matted nodes. The deep cervical nodes are involved with matting, ulceration and abscess formation. A fluctuant mass is present in 10% of patients and a draining sinus is present in 5% of patients. Skin overlying the lesion may appear erythematous and may be tender to palpation. The clinical course and treatment are different for tuberculous and non-tuberculous mycobacteria, therefore it is important to differentiate between masses caused by them. The posterior and supraclavicular lymph nodes are involved with tuberculous mycobacterial infections. Non-tuberculous mycobacterial infections involve submandibular and submental cervical lymph node groups. These infections are generally seen in children between the ages of one and five, and in immunocompromised patients. Constitutional symptoms are rare, and chest x-rays are negative for signs of pulmonary TB.

The incidence of tonsillar, submandibular and submental lymph nodes affected by M. tuberculosis could be as high as 10% of cases of pulmonary TB. The consistency of nodules varies with the stage of disease. A clinical classification by Hooper states that in Stage 1 the nodes are enlarged, firm, mobile, discrete and slightly tender, showing non-specific reactive hyperplasia. In Stage 2 the nodes are larger, rubbery and fixed to surrounding tissues because of perinodular abscess formation. In Stage 3 there is central abscess formation, Stage 4 collar-stud abscess formation and Stage 5 sinus formation. Treatment in the management of peripheral lymph node TB includes surgical incision with chemotherapy first and then surgery or chemotherapy alone with anti-tubercular drugs for varying durations.

**Larynx**

There are two theories that attempt to explain the infectious route of laryngeal TB. The bronchogenic theory states that the larynx is infected by direct spread of large numbers of bacilli from the endobronchial tree, while the haematogenous theory suggests that the larynx becomes involved through the haematogenous route from other distant primaries rather than direct spread from the airway. Due to the fact that the bronchogenic mode of transmission is more common, chest x-rays should form part of the examination.  

Laryngeal TB is rare, occurring in less than 1% of TB cases. Hoarseness is the most common symptom. Patients may also describe odynophagia, cough, otalgia and signs of stridor. The vocal folds (true followed by the false) are the most commonly affected sites and make up 50–70%, closely followed by the ventricular bands, which make up 40–50% of cases. The epiglottis, aryepiglottic fold, arytenoid, posterior commissure and subglottis make up 10–15% of cases of laryngeal TB. The anterior half of the larynx is affected twice as often as the posterior half.

Clinical features in laryngeal TB vary, from ulcers on the true vocal folds to hypertrophic nodules and hyperaemia and ecedema of the arytenoids and of the aryepiglottic folds. Broad-based exophytic lesions without significant erythema and oedema may also be seen. Histopathological examination must be done to differentiate between cancer and laryngeal TB. Patients with laryngeal TB are treated with anti-tuberculin medications and demonstrate a quick clinical response and rarely require a tracheotomy to secure the airway.

**Nasal**

Nasal TB is rare. The English literature has reported 26 cases during the 20th century. It is caused either by a primary infection or is secondary to a pulmonary disease. Common sites of involvement are the cartilaginous septum and the inferior turbinate. The lesions may present as ulcers or polyps. The lesions of the para-nasal sinuses present as pale, polypoidal mucosa of the maxillary antrum or multiple polyps of the ethmoid. Bone involvement with fistula formation is rare. TB of the nasal cavity is painless and causes nasal obstruction and catarrh. Treatment for nasal TB is varied. Surgical excision, diathermy, cautery, lactic acid application and radium treatments were the early regimens. There could be recurrence with surgical excision. Since 1951, reported cases have been treated with anti-TB medication and no recurrences have occurred.

**Oral cavity**

Less than 3% of the TB cases involve the oral cavity. The bacteria can infect oral tissues and lymph nodes. Within the oral cavity, lesions occur in the soft tissues and supporting bone and in tooth extraction sites, and the tongue and floor of the mouth. They occur in the following order – tongue tip, tongue border and floor of the mouth, soft palate anterior tonsillar pillar and uvula, and dorum and base of the tongue. Oral lesions appear as painful ulcers, nodules, fissures and tuberculosis granulomas. The tuberculosis oral ulcerations may be solitary or multiple, occasionally painful and usually involves the dorus of the tongue. The mature ulcer has an irregular outline and a rough or granular surface. The surrounding mucosa is erythematous and oedematous.

The infection in the oral cavity requires mucosal injury and could result from pulmonary disease. The gingiva, dental sockets and buccal folds are commonly involved by direct inoculation. These lesions can be distinguished from carcinoma by histological examination. Primary tuberculosis lesions of the mouth, which are seen in younger patients, are generally painless and there may be regional lymphadenopathy present. When they become secondarily infected with bacteria from the oral cavity, they may become painful. Secondary TB is more common among older patients and is usually a complication of pulmonary disease.
painful, grayish yellow, firm and well demarcated. Gingivitis tuberculosis presents as irregular, nodular lesions that may cause more diffuse involvement. 50, 51, 52

Due to the low prevalence of oral TB lesions it is often not considered in differential diagnoses. However, with the recent reversal in the incidence of TB it should always be included in the differential diagnosis of oral ulcerations as delay in the diagnosis may have serious consequences. 46, 50, 51 Chemotherapy is used to treat TB of the oral cavity. 3

Jaws

TB of the mandible and temporomandibular joint (TMJ) is rare. The incidence does not exceed 1.4% of all patients affected by the disease. Young patients with pulmonary involvement can present with TB of the mandible. TMJ TB can be a primary infection or a fistulous communication from TB otitis media. Trismus and a painful fluctuant swelling in front of the ear are the symptoms experienced. 22

TB of the jaws is manifested as a tuberculous granuloma or tuberculous osteomyelitis. Radiographically, the tuberculous granuloma presents as a peripical radiolucency involving a non-vital tooth. Pain and swelling of the affected area is present. The swelling later softens and ruptures intra-orally or extra-orally. Sinus tracts are then present and trismus occurs when the mandible is affected. 83 The spread of infection may occur through an extraction socket, mucosal tear associated with an erupting tooth, regional extension of a soft tissue lesion to underlying bone, or by haematogenous spread. Apical osteitis, periodontitis with horizontal bone loss, or a widespread destructive osteolytic lesion, are some of the presentations. It may be mistaken for a dental abscess in the absence of systemic symptoms. 84 The patient recovers with anti-tuberculous treatment. In tuberculosis osteomyelitis, complete drainage of the abscess and removal of necrotic bone is done in combination with anti-tuberculous chemotherapy. Although TB rarely affects the jaws, it should be considered in differential diagnosis of chronic joint and in infectious bone disease, since it continues to be a health problem in both developed and underdeveloped countries. 63, 66

Differential diagnosis

A differential diagnosis for oral TB should include malignancy, traumatic and aphthous ulcers, syphilis, sarcoidosis and deep mycotic infections. 53-56, 58, 61 Differential diagnoses for TB of the jaw is pyogenic osteomyelitis, actinomycosis neoplastic lesions or osteogenic sarcoma 31 and lymphoma or secondary metastasis in the neck. 31

Cervical spine

TB of the cervical spine occurs more often in prepubertal children than in adults. The commonest symptom of TB of the cervical spine is pain followed by dysphagia, dyspnoea and stridor due to pressure effects. Abscess formation presents as a retropharyngeal abscess, sternomastoid abscess or parotid mass. 3, 22 Large abscesses are treated surgically. 3

Aural

TB affecting the middle ear cleft has dramatically decreased over the past 40 to 50 years. This could be due to the availability of specific bacterial anti-tuberculous drugs, improvement in the public health services, massive inoculation of cattle with the virtual eradication of Bovine-train TB, improvement in housing and widespread Bacille Calmette-Guérin (BCG) inoculation campaigns directed at babies and children of school age. 67

Aural TB is usually found in children and young adults. Typical features are painless otorhoea, central perforation, pale middle-ear granulations, severe hearing loss and facial paralysis. Aural TB is usually found in children and young adults. Typical features are painless otorhoea, central perforation, pale middle-ear granulations, severe hearing loss and facial paralysis. Bone necrosis and sequestration in the mastoid is commonly found. With superimposed infection there may be otalgia, foul smelling infection, acute mastoid infection and fistulisation. 3, 22, 34, 68, 70 Multidrug therapy is the treatment of choice while awaiting culture and sensitivity results for more targeted therapy. Surgical intervention is carried out on patients with facial paralysis, subperiosteal abscess formation, fistulisation, lymphatites, intracranial complications and progressive disease recalcitrant to medical therapy. 3, 34, 67 TB osteomastoiditis is a rare complication of TB today. When it occurs, it may cause significant morbidity. Diagnosis is difficult if the patient shows no other manifestations of the disease and may be delayed for months or years, since most physicians are not familiar with the typical presenting features. 71

Salivary glands

TB of the salivary glands is rare and only about a hundred cases have been reported in the world-wide literature. It can be central, with involvement of the intra-glandular lymph nodes, or diffuse, with involvement of the parenchyma. Parotid involvement presents as a firm, non-tender mass. Abscess formation and fistulisation may also occur. Seventh nerve palsy is rarely seen. 70 The parotid gland is the most commonly involved, followed by the submandibular and then sublingual gland. In the parotid the infection arises in the intra-parotid lymph nodes, the bacilli reaching the gland either via the duct or through the lymphatic channels.

Patients are generally well, with no evidence of pulmonary involvement therefore TB infection is often indistinguishable from neoplasia. Pain manifests later and facial palsy is rare. 3 Anti-tuberculous chemotherapy is the standard treatment. Surgical intervention is avoided in these patients. 3, 24 TB of the salivary gland should always be included in the differential diagnosis of salivary gland tumour, especially in the areas where TB is endemic. This would avoid unnecessary surgery for histological confirmation and anti-tuberculous medication would be sufficient to resolve the condition. Therefore the combination of fine needle aspiration cytology and molecular biology methods such as polymerase chain reaction should be used as initial diagnostic tools for the diagnosis of salivary gland TB. 72

Pharynx

Pharyngeal infection is slowly progressive and presents as a chronic nodular irregularity of mucosal surfaces. The two main sites of pharyngeal involvement are the nasopharynx and oropharynx. These are mostly primary infections. Nasal obstruction with rhinorrhoea is the most common complaint. Cervical lymphadenopathy may accompany nasopharyngeal TB. Ulcerations and fibrosis of the tonsils make it difficult to distinguish between tonsillar TB and tonsillar carcinoma. 3, 24 Treatment with chemotherapy shows rapid improvement. 3

Eye

TB of the eye is rare and is found in about 1.4% of patients. The common site of occurrence is the posterior and anterior uveal tract. Primary or secondary involvement of the eye can occur. Primary disease is the result of direct inoculation by contaminated fingers, dust or droplet nuclei from sputum and is rare. This results in conjunctivitis, corneal ulcerations or abscess formation. The causative organism could be M. tuberculosis or M. fortuitum. In secondary TB infection of the eye, the organism reaches the eye via the blood and this may be the only manifestation of the disease. 52
ORAL HEALTH CONSIDERATIONS

The risk of TB transmission from patients to oral healthcare workers is considered to be minimal. However, *M. tuberculosis* is uniquely hazardous to oral healthcare workers because of its airborne route of transmission, lack of effective vaccination, the long and tedious treatment regimen, presence of resistant strains and the long-term sequelae of the infection.

Historically, tuberculosis has been regarded as an occupational hazard for oral healthcare workers; at present persons who work with high-risk patients or in high prevalence communities are still considered at risk for new infection.

Standard precautions provide the fabric for strategies to prevent or reduce the risk of exposure to blood borne pathogens and other potentially infectious material. Surgical masks do not prevent inhalation of *M. tuberculosis*, therefore standard precautions are inadequate to prevent the spread of this organism through droplet nuclei 1–5 microns in diameter and additional measures are necessary to prevent the spread of *M. tuberculosis*.

When an oral healthcare worker has to provide urgent dental treatment to patients with suspected or active TB, filtering face piece respirators (such as N95, N99 or N100 – certified by the CDC’s National Institute for Occupational Safety and Health (NIOSH) should be used to prevent inhalation of infectious droplet nuclei. An N95 respirator is at least 95% efficient in filtering 0.3 micrometers-diameter particles. The oral healthcare worker must be trained to use the mask to ensure adequate seal between the face and the edges of the mask. Differences between disposable respirators and surgical masks include fit against face, wear time, testing and approval. Particulate respirators protect the user from inhaling particles, including small microorganisms (less than 10 micrometers in diameter).

In contrast, surgical masks protect against large particles generated by the user; protect the user’s mouth and nose from large particle droplet splash, spray or spatter that contain pathogenic microorganisms; and should be placed on coughing patients to limit potential dissemination of infectious respiratory secretions to others (that is cough etiquette). Surgical masks are not CDC/NIOSH-certified as respirators and do not protect the user adequately from inhaling airborne contaminants, including *M. tuberculosis*, because they have a looser fit and lower filtration efficiency than do the N95 respirators. The fit of most surgical masks allows a gap between the edge of the mask and face that permits inhaled air to flow around the sides of the mask. The magnitude of risk varies by setting, occupational group, and prevalence of TB in the community, patient population served in the setting, procedures performed and effectiveness of TB infection control measures. Every setting in which services are provided to persons who have suspected or confirmed TB disease should have a TB infection control plan. The probability of a person exposed to *M. tuberculosis* becoming infected depends on the concentration of infectious droplet nuclei in the air and the duration of exposure to a person with infectious TB disease. Environmental factors, such as exposure in confined spaces, inadequate ventilation and recirculation of air containing infectious droplet nuclei, further increase the likelihood of transmission.

Cases with positive smears are highly infectious. Prior to the AIDS epidemic it was accepted that pulmonary cavity formation was necessary for contagiousness. However, patients with AIDS and pulmonary TB may be highly contagious in the absence of cavitations and normal chest radiographs. This results in delayed diagnosis and a greater risk of nosocomial transmission.

There is a paucity of data linking dental instrumentation to the generation of droplet nuclei containing *M. tuberculosis*. Similarly, the reported incidence...
of tuberculin skin test conversion among oral healthcare workers is low.74,80 It can however be anticipated that oral healthcare workers and patients with infectious TB disease will generate droplet nuclei by coughing, sneezing, laughing and talking; therefore, therapeutic intervention could stimulate coughing and promote the generation of infectious particles.

Since patients and oral healthcare workers share the same air space, the potential for the transmission of M. tuberculosis cannot be discounted.81 Although oral healthcare workers are not responsible for diagnosis and treatment of TB, they should be trained to recognize signs and symptoms (Table 1) to help with prompt detection. Infection control procedures at dental treatment should include knowledge of the signs and symptoms of active TB, an updated medical history related to respiratory illness and referral of suspicious patients for medical evaluation.

Table 1: Patient history prompting suspicion of active TB

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Productive cough (&gt;3 weeks) – pulmonary TB</td>
</tr>
<tr>
<td>2</td>
<td>Other symptoms (fever, chills, night sweats, fatigue, chest pain, loss of appetite and weight, weakness, coughing up blood)</td>
</tr>
<tr>
<td>3</td>
<td>Extrapulmonary TB (occurs in 15% of case)</td>
</tr>
<tr>
<td>4</td>
<td>Patients with TB and HIV infection – 40–75% have extrapulmonary TB and pulmonary TB</td>
</tr>
<tr>
<td>5</td>
<td>History of TB exposure and/or previous TB infection (active TB)</td>
</tr>
</tbody>
</table>

Source: Davidson, 2002

Hand-washing must be done prior to and following patient contact, instruments must be sterilized and contaminated working surfaces must be disinfected with phenol and glutaraldehyde. Well-constructed, soft, pleated, high-filtration face masks must be worn when aerosols are produced during dental treatment. Masks must be kept dry to avoid microbes passing through. Aerosols can be reduced by avoiding the use of water spray from the triplex syringe and by using a rubber dam and high volume suction. The probable transmission of MDR TB disease from patients to two oral healthcare workers has been documented in the United States, and there is evidence of TB disease transmission from an oral surgeon to 15 patients following extractions.82,83

The 2005 CDC guidelines for preventing the transmission of M. tuberculosis in healthcare facilities explicitly identify oral healthcare settings as outpatient settings in which patients with suspected or confirmed infectious TB disease are expected to be encountered.84 This inclusion is based on the assumption that patients with infectious TB disease may present in the dental setting for urgent or routine dental care and oral healthcare workers might share air space with persons with infectious TB disease or might come in contact with clinical specimens that contain M. tuberculosis.

Therefore, every oral healthcare facility should have a TB infection control plan that is part of its written infection control/exposure control protocol. The TB infection control component of an overall infection control/exposure control programme should be appropriate for the level of risk in the specific healthcare setting and should be based on a three-level hierarchy of administrative, environmental and respiratory protection controls.74,82,84,85

INFECTION CONTROL MEASURES FOR TB IN A DENTAL SETTING

TB infection control policies and protocols for implementing these control measures should be included in a dental setting’s overall TB infection control programme and should be reviewed annually.

Table 2: Tuberculosis precautions for outpatient dental settings

<table>
<thead>
<tr>
<th>Administrative controls</th>
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<tbody>
<tr>
<td>Assign responsibility for managing TB infection control programme</td>
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<tr>
<td>Conduct annual risk assessment</td>
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<tr>
<td>Develop written TB infection control policies for promptly identifying and isolating patients with suspected or confirmed TB disease for medical evaluation or urgent dental treatment</td>
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</tr>
<tr>
<td>Instruct patients to cover mouth when coughing and/or wear a surgical mask</td>
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</tr>
<tr>
<td>Ensure that oral healthcare personnel (OHCP) are educated regarding signs and symptoms of TB</td>
<td></td>
</tr>
<tr>
<td>When employing OHCP, ensure that they are screened for latent TB infection and TB disease</td>
<td></td>
</tr>
<tr>
<td>Postpone urgent dental treatment</td>
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</tbody>
</table>

Environmental controls

- Use airborne infection isolation room to provide urgent dental treatment to patients with suspected or confirmed infectious TB
- In settings with a high volume of patients with suspected or confirmed TB, use high-efficiency particulate air filters or ultraviolet germicidal radiation

Respiratory protection (RP) controls

- Use RP – at least an N95 filtering face piece (disposable) – for OHCPs when they are providing urgent dental treatment to patients with suspected or confirmed TB
- Instruct TB patients to cover mouth when coughing and to wear a surgical mask

Source: Jensen et al., 2005

The first and most important level in the TB infection control programme is the implementation of administrative controls which is the first line of defence and should reduce the risk of exposure of dental staff and patients to people with active TB (Table 2). These administrative controls are intended to reduce the risk of exposure to persons who might have infectious TB disease, and are essential prerequisites for the effectiveness of environmental controls and respiratory protection controls in all settings where patients with suspected or confirmed TB disease are expected to be encountered.85,86

Although the overall risk of oral healthcare workers for exposure to a patient is probably low, every oral healthcare setting should conduct initial and ongoing (annual) evaluations of TB risk for the setting and determine the demographics of the patient population served in that setting.85 This will determine the types of administrative, environmental, and respiratory protection controls that are needed for the particular setting. Consultation with the local or state health department must be done.

Patients with signs and symptoms suggestive of TB should be given surgical masks or tissues and if none is available, they should be directed to cough into their sleeves, instructed in respiratory hygiene and cough etiquette (Table 3) and placed in an area away from other patients and staff members.86

Table 3: Respiratory hygiene and cough etiquette measures

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<tbody>
<tr>
<td></td>
<td>Use tissues to cover the nose and mouth and to contain respiratory secretions when coughing or sneezing</td>
</tr>
<tr>
<td></td>
<td>Dispose of tissues in no-touch receptacles (such as those with foot-petal operated lids or an open, plastic-lined wastebasket)</td>
</tr>
<tr>
<td></td>
<td>When coughing or sneezing, if tissues are not available, cover the mouth and nose with the inner surface of the arm and forearm to keep pathogenic organisms away from the hands; although M. tuberculosis cannot be spread by the hands, other respiratory pathogens, such as rhinoviruses, can</td>
</tr>
<tr>
<td></td>
<td>Practise hand hygiene (such as hand washing with non-antimicrobial soap and water, alcohol-based hand rub or anti-septics hand wash) after having contact with respiratory secretions or contaminated objects and materials; hand hygiene is recommended to prevent transmission of all respiratory illnesses, in general, but will not affect TB transmission</td>
</tr>
</tbody>
</table>

Source: CDC, 2005
Contact with patients with undiagnosed or unsuspected infectious TB disease is the primary risk of exposure to *M. tuberculosis* in the oral healthcare setting. A high index of suspicion and rapid implementation of precautions are essential to prevent and interrupt the transmission of *M. tuberculosis*.

Specific precautions will vary depending on the setting, i.e. prevalence of TB in the community, patient population served and the type of services provided in a particular setting.  

The minimum requirements in a community-based oral healthcare setting is the implementation and enforcement of a TB infection control protocol that provides (i) prompt identification of patients with suspected or confirmed infectious TB disease; (ii) separation of patients with suspected and confirmed TB disease from other oral healthcare workers and patients; and (iii) referral of patients with suspected and confirmed TB disease for a medical evaluation and/or required oral healthcare procedures to a facility with appropriate environmental controls and respiratory protection controls.  

An essential part of administrative controls in a TB infection control programme is the education and training of oral healthcare workers, which include all paid and unpaid persons working in the oral healthcare setting who have the potential for exposure to *M. tuberculosis* through air space shared with persons with suspected or confirmed infectious TB disease.  

Risk classification for the setting will determine the need for and frequency of TB screening for oral healthcare workers. Oral healthcare facilities are considered medium risk settings.

All oral healthcare workers should receive baseline TB screening at the time of employment. Follow-up TB screening should be performed annually. Oral healthcare workers with positive results should be evaluated promptly for TB disease. Radiographs are also important as part of the evaluation. Preventive therapy should be offered to all personnel with baseline-positive results. Personnel with TB disease should be excluded from the workplace until they are receiving adequate therapy, their cough has resolved and their sputum smears are negative.

The concept of universal precautions is the key element of infection control in dentistry since medical history and examination cannot reliably identify all patients or carriers of infections. All patients must therefore be regarded as potentially infectious. Deferral of non-emergency care may be indicated when patients present for dental treatment with diseases such as TB, and they should then be treated when they are non-contagious.  

Patients requiring urgent dental treatment should be referred to a facility with TB engineering controls and a respiratory protection programme. Patients should wear a surgical mask, or be instructed to cover mouth and nose when coughing or sneezing when they are not being evaluated. In order to minimise the spread of respiratory or other diseases in dentistry, emphasis should be placed on vaccination, use of particulate respirators and adequate ventilation. The BCG vaccine is an effective measure that can help control the spread of TB and should be administered to oral healthcare workers in geographic regions or clinical settings where there is a high prevalence of TB.

In addition, the surgery should have good ventilation; aerosols should be controlled by high volume externally vented aspirators and wearing of particulate respirators. Facemasks routinely used by oral healthcare workers may not always provide an effective means of preventing infection. Oral healthcare workers need to be alert to signs and symptoms of TB and refer such individuals for appropriate medical healthcare. A TB screening programme should be established for the protection of both workers and patients. The prevalence of TB in the community or patient population indicates a potential risk for occupational exposure to TB.

Tuberculin skin testing data should be evaluated regularly to enable the dental personnel to evaluate the effectiveness of current infection control practices.

The resurgence of TB as a public health problem, the explosive outbreaks of TB among AIDS patients, reports of transmission to staff and the emergence of drug resistant strains have refocused attention on the risk to oral healthcare workers and has rekindled interest in this disease among oral healthcare workers. However, much research has focused on pulmonary and extrapulmonary TB involving the abdomen and spine and there is a paucity of literature on the head and neck region. Extrapulmonary presentations form a significant proportion of new cases concomitant with HIV epidemic. The increase in numbers of HIV seropositive individuals and the late diagnosis of TB in these patients because of atypical signs and symptoms, suggest that oral healthcare workers may be unknowingly treating infected patients who pose a risk. The generation of aerosols in modern dentistry is a recognised risk for transmission of infection, which is droplet spread. Systemic symptoms may be absent and oral lesions may be the first manifestation of the disease. Therefore oral healthcare workers need to be aware of TB in the head and neck region and its varied manifestations.

REFERENCES  

Additional references (9–87) are available on www.sata.co.za
MUSCULOSKELETAL DISORDERS AMONGST PRACTISING SOUTH AFRICAN ORAL HYGIENISTS

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(Sourced from: SADJ October 2009, Vol. 64, No. 9, p400–p403)

ABSTRACT

Objectives
The study sought to determine the level of musculoskeletal disorders among working oral hygienists in South Africa and potential determinants that are associated with these disorders.

Methods
Oral hygienists registered with the HPCSA were requested to complete an anonymous questionnaire. Apart from demographic information, they were asked to report on any musculoskeletal symptoms experienced in the hands, neck, shoulders and lower back as well as details of workload, types of scaling procedures, size of instruments, the mobility of the operator’s chair and the adjustability of patient chairs.

Results
Of the 362 respondents, 61.3%, 66.5%, 56.6% and 59.6%, experienced hand, neck, shoulder and lower back symptoms respectively. Twenty-eight percent of the respondents performed hand-scaling for more than four hours per day. Twenty-six percent reported immobile operator chairs, while 12.6% reported patient chairs that were difficult to adjust. Employing multivariate analysis, excessive hand-scaling was associated with hand and shoulder symptoms, while immobile operator’s chairs and poorly adjustable patient chairs were respectively associated with neck and lower back problems.

Conclusions
The prevalence of work-related musculoskeletal disorders in practising oral hygienists in South Africa appears to be similar to that in developed countries. Significant determinants of musculoskeletal disorders may be immobile operator stools, poorly adjustable patient chairs and excessive hand-scaling daily.

Keywords: Occupational health and safety, musculoskeletal disorders, predisposing factors, developing country, South Africa

INTRODUCTION
Work-related musculoskeletal disorders constitute a common problem for oral healthcare workers and the prevalence of these disorders is well researched among oral hygienists in the developed world. Data in this regard, however, are lacking for developing nations, such as South African oral hygienists. Apart from a single minor article published on carpal tunnel syndrome in 1985, no other empirical data exists for South African oral
hygienists/oral healthcare workers. South Africa is a developing country with gross socio-economic disparities in which 949 registered oral hygienists work in both the private and public sectors, the latter being often under-resourced. Distinct possibilities exist that some equipment used in clinics and dental practices in South Africa are not designed according to the latest ergonomic standards. This fact may subsequently impact on the wellbeing of oral healthcare workers, such as oral hygienists. A need therefore exists to examine the prevalence and causes of musculoskeletal disorders which affect oral hygienists engaged in active practice in South Africa. Most of the studies from developed countries report a prevalence of work-related musculoskeletal disorders well in excess of 50%. One of the main areas of complaint is the hands, which are often affected by carpal tunnel syndrome. Symptoms of musculoskeletal problems of the hands include tingling in the fingers, numbness and night pain. Factors that may have an influence on the severity of musculoskeletal symptoms in the hand are the use of hand pieces and vibratory instruments, the number of patients with heavy calculus treated per day, the number of working days per week and the numbers of years engaged in dental practice. Medical problems, such as diabetes mellitus, osteo- or rheumatoid arthritis, recent pregnancy, hormonal and/or anti-inflammatory medication may also contribute to these problems. Past or present history of trauma to the hand and/or wrist will also aggravate symptoms experienced in the hand.

Musculoskeletal symptoms related to the shoulders, neck and lower back are also commonly reported. Predisposing factors, such as repetitive motion, pinch grip, force, and prolonged awkward positions, and monotonous work that demands utmost precision, concentration and visual fixation, may lead to the development of musculoskeletal disorders. The prevention of musculoskeletal disorders in the dental practice should focus on the avoidance of repetitive work such as hand-scaling, correct working posture and sitting positions as well as the use of ergonomically designed equipment.

In the absence of such empirical evidence for South Africa, this study was conducted to investigate the prevalence and potential determinants of musculoskeletal symptoms affecting practising oral hygienists in South Africa.

METHODS
Questionnaire
Following a thorough literature review, a questionnaire was designed to determine the prevalence and potential determinants of work-related musculoskeletal symptoms affecting oral hygienists in South Africa. The questionnaire included demographic information, such as geographical location per province, and age of respondents, which was categorised in ten-year cohorts starting at 20–29 years. Similarly, the number of years in practice as an oral hygienist and the number of patients treated per day were recorded in intervals of five, as well as the number of days per week involved in practice. The weekly workload was calculated by multiplying the number of days worked per week with the number of patients treated per day (using the minimum number of the interval). The type of practice was recorded either as a general dental practice, periodontics, orthodontics, prosthodontics, oral-facial surgery or ‘other’, which had to be specified. Symptoms, which included pain during working hours, pain at night, morning stiffness, numbness and tingling feelings, were all recorded. In terms of the hand, loss of strength and problems with instrument grip were also enquired about and were considered negative symptoms.

Characteristics of the operator’s chair were examined in terms of its mobility and the presence or absence of wheels, arm and back support.

Table 1: Geographical distribution of the respondents compared with the total registered oral hygiene workforce in South Africa

<table>
<thead>
<tr>
<th>Province</th>
<th>HPCSA registrations</th>
<th>Respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauteng</td>
<td>365</td>
<td>155</td>
<td>42</td>
</tr>
<tr>
<td>Eastern Cape</td>
<td>39</td>
<td>14</td>
<td>36</td>
</tr>
<tr>
<td>Free State</td>
<td>45</td>
<td>14</td>
<td>31</td>
</tr>
<tr>
<td>KwaZulu-Natal</td>
<td>80</td>
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<td>45</td>
</tr>
<tr>
<td>Limpopo</td>
<td>36</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>Northern Cape</td>
<td>12</td>
<td>4</td>
<td>33</td>
</tr>
<tr>
<td>Mpumalanga</td>
<td>44</td>
<td>15</td>
<td>34</td>
</tr>
<tr>
<td>Western Cape</td>
<td>297</td>
<td>98</td>
<td>33</td>
</tr>
<tr>
<td>Northern Cape</td>
<td>31</td>
<td>12</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>949</td>
<td>358</td>
<td>37.7</td>
</tr>
</tbody>
</table>

Table 2: Percentage distribution: Age of the respondents, years in practice and working days per week in practice

<table>
<thead>
<tr>
<th>Age (Years)</th>
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<th>%</th>
</tr>
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<tbody>
<tr>
<td>20–29</td>
<td>120</td>
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<tr>
<td>30–39</td>
<td>116</td>
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<td>40–49</td>
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<td>50–59</td>
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<td>60+</td>
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<table>
<thead>
<tr>
<th>Years in Practice</th>
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<th>%</th>
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<tbody>
<tr>
<td>1–5</td>
<td>106</td>
<td>29.4</td>
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<tr>
<td>6–10</td>
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<td>11–15</td>
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<td>22–25</td>
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<td>26+</td>
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<thead>
<tr>
<th>Working days per week in practice</th>
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<th>%</th>
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<tbody>
<tr>
<td>1</td>
<td>9</td>
<td>2.5</td>
</tr>
<tr>
<td>2</td>
<td>23</td>
<td>6.4</td>
</tr>
<tr>
<td>3</td>
<td>45</td>
<td>12.6</td>
</tr>
<tr>
<td>4</td>
<td>52</td>
<td>14.6</td>
</tr>
<tr>
<td>5</td>
<td>202</td>
<td>56.6</td>
</tr>
<tr>
<td>6</td>
<td>26</td>
<td>7.3</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Number of patients treated per day</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5</td>
<td>52</td>
<td>14.4</td>
</tr>
<tr>
<td>6–10</td>
<td>138</td>
<td>38.3</td>
</tr>
<tr>
<td>11–15</td>
<td>92</td>
<td>25.6</td>
</tr>
<tr>
<td>16–20</td>
<td>36</td>
<td>10.0</td>
</tr>
<tr>
<td>21–25</td>
<td>18</td>
<td>5.0</td>
</tr>
<tr>
<td>26+</td>
<td>24</td>
<td>6.7</td>
</tr>
</tbody>
</table>
Adjustability of the patient’s chair was determined either by a ‘yes’ or a ‘no’ response. Respondents also had to indicate whether they were engaged in hand-scaling and subsequently had to indicate the number of hours per day in which they were involved in this type of activity. Similar responses were anticipated for questions on sonic/ultrasonic scaling, polishing of teeth with a polishing hand piece and orthodontic treatment (specifically assisting with banding). Respondents were asked to indicate whether they rested between patients and, if so, for what period and how often they exercised their hands, backs, necks and shoulders. They also had to indicate how many times per week they were engaged in any other type of exercise, such as jogging, walking and whether they exercised in a gymnasium. Respondents were finally requested to complete a medical questionnaire, on which they were to indicate whether they suffered from arthritis, diabetes, gout, and whether or not they were receiving oestrogen therapy; whether they were pregnant or using contraceptives. Previous incidents of trauma and/or treatment (type of treatment was not specified) to the fingers, hands, wrist, shoulder, neck and lower back were also recorded.

It must be noted that the custom designed questionnaire was not tested for its psychometric properties and the results of this study will hence provide the first evidence of whether the questionnaire may be valid or not.

### Data collection

Questionnaires were sent to the 949 oral hygienists registered with the Health Professions Council of South Africa (HPCSA) in 2005. An accompanying letter explained the purpose of the study and assured anonymity of respondents’ responses. In order to maximise the response rate, the oral hygienists were subsequently reminded at three occasions in three-month intervals during the study period to complete and return their questionnaire. Responses were returned in sealed envelopes provided by the researcher and the data captured and analysed by the Biostatistics Unit of the Medical Research Council of South Africa.

### Statistical analysis

The Chi-squared method of statistics analysis was used to assess the geographical representation of the respondents. Logistical regression models were constructed to examine the independent association between any neck, shoulder, lower back and hand symptoms and the variables: age, number of years in practice, the presence of a medical history related to the respective body part which may have an influence on an adjacent body part; reporting of hours of exercise as well as hand- and sonic/ultrasonic-scaling, operator chair mobility, arm and back support and the adjustability of the patient chair. Only variables that had a p-value of less than 0.3 were retained in the model. For the purpose of the analysis, the fingers and wrist were considered to be part of the hand. The level of statistical significance was set at p<0.05.

### RESULTS

The response rate for this study was 38% (n=362). The geographical distribution (Table 1) of the oral hygienists registered with the HPCSA and that of the respondents did not differ significantly (p=0.76).

Ninety-two percent of the respondents were employed in private dental practices, while the remaining 8% worked either in the public sector or as representatives of dental companies. Of those working in private practices, 75.2% were employed by general dental practitioners, while 40.5% worked for dental specialists. These figures do not add up to a 100% since a large portion of the oral hygienists worked in both general dental practices as well as for dental specialists. Of those working for dental specialists, 70.2% were employed by orthodontists. The distributions of the respondents’ age, number of years in practice, number of working days per week in practice, and patients employed by orthodontists. These figures do not add up to a 100% since a large portion of the oral hygienists worked in both general dental practices as well as for dental specialists. Of those working for dental specialists, 70.2% were employed by orthodontists. The distributions of the respondents’ age, number of years in practice, number of working days per week in practice, and patients treated per day are summarised in Table 2.

About 76.9% participated in general exercise, such as jogging, regular exercise in a gymnasium or walking. Most of the oral hygienists (34.2%) exercise three times a week, while 24% exercise twice a week.

Biostatistic analysis (Chi-squared test) did not show any significant association between any of the musculoskeletal symptoms and medical history reports of pregnancy (or recent pregnancy), oestrogen therapy, the use of contraceptives or diabetes, and hence these factors were not included in the logistical regression models.

<table>
<thead>
<tr>
<th>Table 3: The multivariate association between potential predisposing factors and hand symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Presence of a hand symptom</strong></td>
</tr>
<tr>
<td><strong>OR (95% CI)</strong></td>
</tr>
<tr>
<td>Medical history (yes=1/no=0)</td>
</tr>
<tr>
<td>Hand exercises (yes=1/no=0)</td>
</tr>
<tr>
<td>Workload (patients per week)</td>
</tr>
<tr>
<td><strong>Hand-scaling</strong></td>
</tr>
<tr>
<td>&lt;1 hour (0) Reference</td>
</tr>
<tr>
<td>1–4 hours (half-day) (1)</td>
</tr>
<tr>
<td>5–8+ hours (full day) (2)</td>
</tr>
<tr>
<td>*p&lt;0.05</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 4: The multivariate association between potential predisposing factors and neck, shoulder and lower back symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Presence of symptoms in the body part</strong></td>
</tr>
<tr>
<td><strong>Neck</strong></td>
</tr>
<tr>
<td><strong>Shoulder</strong></td>
</tr>
<tr>
<td><strong>Lower back</strong></td>
</tr>
<tr>
<td><strong>OR (95% CI)</strong></td>
</tr>
<tr>
<td>Age (years)</td>
</tr>
<tr>
<td>Medical history (yes=1/no=0)</td>
</tr>
<tr>
<td>Shoulder impact (yes=1/no=0)</td>
</tr>
<tr>
<td>Neck impact (yes=1/no=0)</td>
</tr>
<tr>
<td>Workload (patients per week)</td>
</tr>
<tr>
<td><strong>Hand-scaling</strong></td>
</tr>
<tr>
<td>&lt;1 hour (0) Reference</td>
</tr>
<tr>
<td>1–4 hours (1)</td>
</tr>
<tr>
<td>5–8+ hours (2)</td>
</tr>
<tr>
<td><strong>Sonic/Ultrasonic scaling</strong></td>
</tr>
<tr>
<td>&lt;1 hour (0)</td>
</tr>
<tr>
<td>1–4 hours (1)</td>
</tr>
<tr>
<td>5–8+ hours (2)</td>
</tr>
<tr>
<td><strong>Operator chair</strong></td>
</tr>
<tr>
<td>Immobility (yes=1/no=0)</td>
</tr>
<tr>
<td>Lack of arm support (yes=1/no=0)</td>
</tr>
<tr>
<td>Patient chair (yes=1/no=0)</td>
</tr>
<tr>
<td>Difficult to adjust (yes=1/no=0)</td>
</tr>
<tr>
<td>*p&lt;0.05</td>
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XX
Hand
At least 61.3% of the respondents indicated that they had experienced one of the hand symptoms, while 17.9% reported that they had either suffered from arthritis, gout, trauma, or had had treatment to the hands, fingers or wrists. Twenty-eight percent of the respondents performed hand-scaling in excess of four hours per day, 39.2% hand-scaled between one to four hours per day and 32.8% of the sample did not engage in hand-scaling at all. Of the respondents, 41% and 34.3% respectively, spent one to four hours, and five or more hours on sonic/ultrasonic-scaling. Moreover, 24.8% did not perform sonic/ultrasonic-scaling at all. Only 25% of the respondents exercised their hands.

The multivariate analysis showed that hand-scaling for five or more hours per day and the number of patients per week significantly (p < 0.05) increased the likelihood for a positive report of hand symptoms (Table 3).

Neck and shoulder
Of the respondents, 66.5% reported at least one of the neck symptoms, 56.6% reported a shoulder symptom, while 23.9% and 7.2% reported trauma or previous treatment to the neck and shoulders, respectively. More than a quarter (26%) of the respondents worked on immobile operator chairs 9.7% of the chairs having no back support and 21.4% had no arm support.

A medical history of trauma or treatment to the neck, the presence of shoulder symptoms and the limited mobility of the operator chair showed independent associations with the presence of neck symptoms (Table 4). Conversely, neck symptoms and hand-scaling for five hours or more per day were independently associated with shoulder symptoms (Table 5).

Lower back
Approximately 59.6% indicated lower back symptoms and 15.4% reported trauma or previous treatment to the lower back.

A medical history (Table 4) of trauma or lower back treatment and a patient chair that is difficult to adjust, independently increased the likelihood of lower back symptoms. It was noted that 12.6% of patient chairs were difficult to adjust.

DISCUSSION
Although the response rate of this study was relatively low, the results of the study show that the geographical distribution of the oral hygienists who responded to the questionnaire does not differ significantly from the geographical distribution of the total population of registered oral hygienists in South Africa.
and that the group who responded to the questionnaire could therefore be regarded representative of oral hygienists in South Africa.

The results of the current study confirm a prevalence of musculoskeletal symptoms in excess of 50%, which was also the level measured in a number of similar studies. As in a previous study, age was not identified as an independent risk factor for musculoskeletal problems. Unlike previous studies, factors such as years of experience in practice was not associated with musculoskeletal symptoms when subjected to multivariate analysis in the current study. Only workload (number of patients per week) was shown to have a significant association with hand symptoms.

The results of this study also show that hand-scaling was significantly associated with musculoskeletal symptoms in the hand and that the ‘level’ of such symptoms is directly proportional to the time spent on hand-scaling (Table 3). This is probably related to the number of patients with heavy calculus treated per day; hand-scaling entails a repetitive motion accompanied by a forceful grasp and has been identified as a predisposing factor in previous studies. Most alarming is the high percentage (28%) of oral hygienists who still perform hand-scaling for extended periods of time. Unlike previous studies, a medical history of hand problems and treatment did not show significant correlation.

Excessive hand-scaling was not only associated with hand symptoms, but also with shoulders symptoms. This association between excessive hand-scaling and shoulder symptoms may be explained by the fact that the oral hygienists are performing precision work which requires a certain amount of static loading on the neck and shoulder muscles. To perform the task, the limb must therefore be stabilised by isometric muscular contractions around the proximal (shoulder) joints. The greater the precision in the work, the more stability is needed. Constant muscle contractions therefore have the potential to cause musculoskeletal disorders.

The current study shows that at least one in four oral hygienists is using an immobile operator stool and that one in eight uses a patient chair that is difficult to adjust. The evidence gained from this study suggests that the immobility of the operator chair may play a significant role in the development of neck pain, whereas a patient chair that is difficult to adjust may predispose neck and lower back symptoms. In order to improve the design of dental stools, Marklin studied the working postures of dentists and oral hygienists. He found that both dentists and oral hygienists spent at least half of their time working with their necks flexed $60^\circ$ or more, their trunks flexed $30^\circ$ or greater and one of their shoulders abducted. The typical working position for right-handed dentists and oral hygienists is to abduct the left shoulder and to hold the right arm close to the trunk. Because of the mechanical disadvantage of the muscles with respect to their joints, flexed and abducted joint positions require high muscle forces to hold these static postures. The high muscle forces then produce high compression loads on the joint. Postures assumed by dentists and oral hygienists can require sizeable muscle forces, and concomitantly, high compression loads on the joint. The clinical consequences of prolonged, flexed or abducted postures of the joints may be muscle or even neuromusculoskeletal pain in the neck, shoulder and lower back. Neck and the back symptoms may originate from the forward bending of the head or trunk to compensate for an operator chair which is not mobile or a patient chair that is difficult to adjust, thereby placing a static load on the head, shoulders and arms plus the joints, which are in an unnatural posture and with underlying muscular weakness it can lead to dysfunction of various structures. Because of this static contraction of the muscles, there is virtually no change in the muscle fibres length, which in turn may lead to musculoskeletal complaints. Moreover, the sustained static muscle contraction stretches the tendons and compresses the vascular supply to the muscle and surrounding tissues, thereby reducing the nutrient and oxygen supply. Lactic acid and other metabolites subsequently accumulate in the muscle tissues, which may result in muscle damage or a painful sensation.

Gerwatowski et al., Caruso et al. and Jones recommended prevention and rehabilitation using specific exercises. This study failed to show any association with general exercise, exercises of the hands or rest periods.

The results of this study appear logical and correspond with data already published. Hence, the questionnaire appears to be valid, although improvements could be made. The anatomical boundaries were not visually defined by means of a body chart in the questionnaire in order for the respondents to clearly distinguish the areas described. Therefore some measurement bias might have occurred, for example, between shoulder and neck symptoms. This bias was, however, partly addressed by controlling for the symptoms in the adjacent body part in the logistical regression model, for example, by including shoulder symptoms in evaluating neck symptoms and vice versa. In both cases significant associations were shown, thereby indicating a requirement for the provision of anatomical boundaries in other similar studies. Furthermore, the cross-sectional nature limits the extent to which cause and effect may be established. Nevertheless this ‘one of a kind’ study in South Africa provides valuable empirical evidence regarding potential predisposing factors for musculoskeletal disorders suffered by practising oral hygienists.

CONCLUSION

The prevalence of work-related musculoskeletal symptoms in the responding South African oral hygienist population appeared to be similar to that reported in developed countries. Disconcertingly high percentages of the respondents were utilising immobile operator stools and patient chairs that were difficult to adjust. These factors, in addition to hand-scaling in excess of five or more hours per day, may contribute to preventable work-related musculoskeletal disorders in practising oral hygienists in South Africa.

ACKNOWLEDGEMENTS

The inputs and contributions of Dr Piet Becker of the Biostatistics Unit of the Medical Research Council of South Africa are duly appreciated.

Declaration: No conflict of interest was declared.

REFERENCES


Additional references (5–25) are available on www.sada.co.za
### HIV/AIDS ASSOCIATED MALIGNANCIES OF THE HEAD AND NECK

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**WFP van Heerden**: BChD, MChD, FC Path (SA) Oral Path, PhD, DSc., Department of Oral Pathology and Oral Biology, School of Dentistry, Faculty of Health Sciences, University of Pretoria.

(Sourced from: SADJ November 2012, Vol. 67, No. 10, p590–p592)

### ACRONYMS

**EBV**: Epstein-Barr virus  
**HAART**: Highly Active Antiretroviral Therapy  
**HPV**: Human Papilloma virus  
**KS**: Kaposi’s Sarcoma  
**KSHV/HHV-8**: Kaposi’s Sarcoma Herpesvirus  
**LEC**: Lymphoepithelial Carcinoma  
**NPC**: Nasopharyngeal Carcinoma  
**NHL**: Non-Hodgkin’s Lymphoma  
**OKS**: Oral Kaposi Sarcoma  
**OPC**: Oropharyngeal Carcinoma  
**SCC**: Squamous Cell Carcinoma

### SUMMARY

Patients with HIV/AIDS are at increased risk for the development of malignancy. Kaposi’s sarcoma, non-Hodgkin’s lymphoma and cervical carcinoma in women are regarded as AIDS-defining malignancies. The spectrum of malignancy is, however, changing, particularly where patients receive highly active antiretroviral therapy (HAART). South Africa has the highest number of HIV-infected individuals globally. The possibility of the oral healthcare worker encountering HIV/AIDS-related pathology therefore seems inevitable. The aim of this article is to heighten the awareness of head and neck malignancies occurring in HIV/AIDS whilst highlighting some of the clinical features in order to facilitate early recognition and diagnosis. It is of clinical significance that in many instances, identification of these malignancies precedes HIV/AIDS diagnosis. Optimal patient management requires close co-operation between the oral healthcare practitioner and the extended healthcare team.

### INTRODUCTION

HIV-infected individuals are at far greater risk of developing malignancy compared with their uninfected counterparts. Kaposi’s sarcoma (KS), high-grade B-cell non-Hodgkin’s lymphoma (NHL) and cervical cancer in women are the most common neoplasms associated with HIV/AIDS and are regarded as AIDS-defining. The incidence of non-AIDS defining neoplasms is also being seen with increased frequency in HIV-positive patients and more often in patients who live longer following the institution of highly active antiretroviral therapy (HAART). Non-AIDS defining malignancies of clinical significance in the head and neck include oropharyngeal carcinoma (OPC), nasopharyngeal carcinoma (NPC) as well as squamous cell carcinoma (SCC) and lymphoepithelial carcinoma (LEC) of salivary gland origin. The immune suppression that accompanies HIV/AIDS is an essential co-condition which facilitates virally-induced carcinogenesis, most notably due to Kaposi’s sarcoma Herpesvirus (KSHV/HHV-8), Epstein-Barr virus (EBV) and Human Papilloma virus (HPV). Failure of immune surveillance in HIV/AIDS allows for viral tumorigenesis, which is potentiated by traditional risk factors, such as tobacco and alcohol consumption.

More than two-thirds of the global HIV infections are identified in sub-Saharan Africa, with an estimated number of 5.6 million infections in South Africa alone. Seventy to 80% of HIV-positive patients will manifest a form of HIV/AIDS-related pathology at some stage of the disease. The oral healthcare worker should therefore be adept at clinical recognition and disease management. Head and neck malignancies associated with HIV/AIDS occur at an earlier age than otherwise, and are atypical in their clinical presentation.

Tumour aggressiveness and advancement signifies progressive immune deterioration, increased viral loads and low CD4 cell counts. Malignancy is often the first clinical indication of underlying immune suppression and more so in populations such as ours, which have high numbers of HAART-naïve patients. Successful management of HIV/AIDS malignancies is severely hampered by the presence of disseminated, co-existent infectious pathology – which may be controlled by the implementation of HAART. In developed countries, the successful initiation of HAART has greatly reduced the incidence of most HIV-related infectious and neoplastic pathology. Certain neoplasms, including Hodgkin’s lymphoma, however, appear to be unaffected by HAART.

### KAPOSI’S SARCOMA

KS remains the most common HIV-associated neoplasm. It is an intermediate-grade vascular tumour of lymphatic endothelial cell origin composed of irregularly shaped blood vessels with an inflammatory component. The clinical behaviour of KS depends on the epidemiological form of disease. Classic KS, the form first described in elderly males of Mediterranean descent, runs a protracted, indolent course. Patients present with purple patches and plaques, which are usually restricted to the extremities. Iatrogenic (transplant associated) KS displays borderline to intermediate qualities. Endemic (African) KS is identified most often in young patients residing in central Africa and is frequently complicated by visceral and lymph node involvement. The most prevalent form of KS is seen in association with HIV/AIDS, referred to as epidemic KS. This is an aggressive form of disease with potentially fatal consequences. HHV-8 is implicated as the aetiological agent in all forms of disease, yet infection alone is inadequate for KS initiation and progression. Widespread KS involvement in untreated HIV-positive patients is associated with a particularly poor prognosis and low overall survival rate.

The oral cavity is the first site of KS in up to 22% of cases. Oral lesions occur concomitantly with skin lesions in 71% of cases. Widespread dermal lymphatic involvement leads to facial lymphoedema and cosmetic disfigurement. KS lesions evolve clinically from small, flat hyperpigmented patches to thicker, indurated raised plaques, ultimately forming red-purple, exophytic nodules which are frequently ulcerated within the oral cavity. Intra-oral lesions are multifocal and often involve the hard and soft palate, gingiva, oropharynx and dorsum of tongue.
Soft tissue, bone and salivary gland involvement are also described.\textsuperscript{16,17} Patients complain of mild pain and difficulty in eating and speaking. Secondary candidiasis and bacterial infection of ulcerated lesions is frequent.\textsuperscript{16,17,20,21} Advanced, destructive disease may cause widespread bone loss and marked tooth mobility, the clinical and radiological appearance of which simulates a variety of high-grade malignancies.\textsuperscript{20} The high incidence of oral Kaposis’s sarcoma (OKS) is thought to be due to salivary shedding of HHV-8 viral particles at distinctly higher levels compared with plasma. HHV-8 is most likely harboured within the oropharyngeal epithelium, allowing for replication and sustained salivary shedding.\textsuperscript{22,23}

Management

The main objectives in the management of epidemic KS is to arrest lesional growth and the prevention of disease progression. Therapeutic intervention should be individualised according to the patient’s state of immunity and stage of disease. Early clinical recognition and diagnosis coupled with vigilant follow-up is critical for therapeutic success. Large lesions, which interfere with normal function, may require surgical excision, whilst radiotherapy and chemotherapy are useful adjuncts in cases with severe cosmetic disfigurement. The mainstay of disease control remains HAART, which prevents viral replication, thereby decreasing viral loads and resulting in restoration of immune function. HAART alone results in regression in up to 80% of patients.\textsuperscript{16,19,24,25}

HIV/AIDS-RELATED LYMPHOMAS

Non-Hodgkin’s lymphoma is the second most prevalent HIV-related neoplasm.\textsuperscript{26} Lymphomas seen in HIV/AIDS are high-grade neoplasms, typically of B-cell phenotype. These include diffuse large B-cell lymphoma, plasmablastic lymphoma (PBL) and non-endemic Burkitt’s lymphoma. Anaplastic large cell lymphoma and certain subtypes of Hodgkin’s lymphoma have shown similar increases in incidence.\textsuperscript{3} A significant number of these malignancies are associated with EBV co-infection. EBV-driven lymphomas are rapidly fatal, with most patients failing to survive beyond a year after diagnosis.\textsuperscript{24} The pathogenesis of HIV/AIDS-related lymphomas is complex; however, some of the more aggressive subtypes have shown similar genetic features.\textsuperscript{27} HIV/AIDS-related lymphomas are diagnosed at an advanced stage in patients with low CD4 cell counts and often in those who are HAART-naive.\textsuperscript{1} Tumours are predominantly extranodal and are identified at unusual sites, such as the oral cavity, gastrointestinal tract and central nervous system.\textsuperscript{3} The risk of developing an HIV/AIDS-related lymphoma may be up to 200 times greater than in HIV-negative patients. The prevalence of HIV/AIDS-related lymphomas continues to increase, even in areas where HAART has been implemented successfully.\textsuperscript{2} Nodal-based lymphomas may be difficult to identify in patients with the persistent generalised lymphadenopathy of HIV/AIDS. PBL is a recently recognised, distinct tumour entity occurring predominantly within the oral cavity of immunocompromised patients.\textsuperscript{27} Constitutional signs and symptoms, including fever, night sweats and significant weight loss, are frequently noted.\textsuperscript{3,28} Lesions have a predisposition for involving the attached gingiva and often present as non-specific oral ulceration. Occasionally they present as rapidly enlarging, exophytic and haemorrhagic masses often resembling KS or other soft tissue sarcomas. Tumours presenting as small buccal mucosal or gingival ulcers may be associated with tissue necrosis and clinically resemble necrotising ulcerative gingivitis and other infectious causes.\textsuperscript{4} EBV reservoirs have been identified within the lymphoid-rich areas of Waldeyer’s ring, as well as within epithelial cells of the oropharynx and nasopharynx, which possibly accounts for the high incidence of intraoral tumours.\textsuperscript{29}

Management

Response to treatment in the HIV-infected patient is poor compared with the immunocompetent patient. The advanced stage at diagnosis in these patients is associated with low survival times, with many patients dying within weeks to months. The small percentages of patients who show complete treatment response tend to suffer frequent relapses. Therapy is directed at restoration of immune function through the use of antiretroviral therapy and a combination of chemotherapy and radiation therapy. Improvement in prognosis depends largely on successful HAART and early therapeutic intervention. It is recommended that, for best results, patients be referred for appropriate treatment within two weeks of diagnosis.\textsuperscript{3,29}
NON-AIDS DEFINING MALIGNANCIES

HPV-related oropharyngeal carcinoma

There has been a dramatic increase in the number of oropharyngeal cancers in the setting of HIV/AIDS. Tumours are strongly associated with high-risk subtypes of HPV and occur in a younger subset of patients as compared with conventional smoking and alcohol-associated head and neck SCC. The mode of HPV transmission is through high risk oral sex practices. It is predominantly a disease of young males and often presents with early nodal involvement. Tumours arise deep within tonsillar crypts or within the base of tongue where they may easily escape clinical detection. Recent studies have also shown a link between HPV and laryngeal and conjunctival SCC.

Tumours seen in patients on HAART

The longer lifespan afforded to those patients who receive HAART has seen a rise in the incidence of several ‘infectious neoplasms’. These include EBV-related SCC and LEC of salivary gland origin, NPC and occasional smooth muscle tumours, as well as Merkel cell carcinoma due to Merkel cell Polyoma virus. The acquisition of such neoplasms is closely related to male gender, smoking, older age and a slightly higher CD4 cell count as compared with the AIDS-defining tumours. These malignancies have been attributed to the direct oncogenic effect of HIV in an aging HIV-positive population.

CONCLUSION

Heightened awareness of the malignancies associated with HIV/AIDS will allow for greater recognition and appropriate management. Malignancies are increased in both HAART-naive patients as well as those who receive antiretroviral therapy. The clinical significance in the dental setting lies in the fact that many such neoplasms are the first indication of underlying immune suppression. A multidisciplinary approach will allow for optimal patient management.

Declaration: No conflict of interest declared

REFERENCES

CATCHING UP AT THE EXPANDED FUNCTIONS COURSE

Mart-Marie Potgieter

16–20 January 2017 at Tygerberg and Mitchells Plain UWC Dental Faculty Campus, Cape Town

Presented by the UWC Faculty of Dentistry, Department of Oral Hygiene

Twenty-seven oral hygienists arrived on Monday, 16 January 2017, to attend the Expanded Functions Course in beautiful Cape Town. We were from different parts of the country, different practice settings and different age groups. It was lovely to catch up with old classmates and to make some new friends.

During this course, we were evaluated through written and online tests, as well as a practical examination. And we survived!

Through this week we have learnt from the lecturers and each other, had some debates in the discussion sessions and shared some practical tips along the way. A week well spent.

We’d like to say a special thank you to the UWC lecturers for all their hard work, they went out of their way to accommodate us. A special thank you to the caterers as well for making sure we didn’t go hungry.

Thank you again!

Group after a practical session with Dr P Brijal

Group with all the lecturers of UWC Oral Health Department
The American Dental Hygienists’ Association (ADHA) was saddened to learn that Esther Wilkins, BS, RDH, DMD, dental hygiene’s matriarch, died on Monday, 12 December 2016. We had celebrated her hundredth birthday only three days before. Wilkins dedicated her life to advancing oral healthcare, and her commitment to dental hygiene will not be forgotten.

Wilkins was the author of the textbook, Clinical Practice of the Dental Hygienist, the first edition of which appeared in 1959. The 12th edition was published this year. More than 90% of the dental hygiene education programs in the world include it on the syllabus. Every edition has a differently colored cover, and the book is so iconic to dental hygienists that, amongst themselves, they identify the era in which they were educated by the color of the book they used.

Wilkins earned a certificate in dental hygiene from the Forsyth School for Dental Hygienists in Boston, Massachusetts, in 1939. She worked in private practice and in a school clinic while pursuing a doctorate in dentistry, which she earned from Tufts School of Dental Medicine in 1949.

In 1950, Wilkins single-handedly established the University of Washington Dental Hygiene Programme, developing the curriculum and teaching most of the courses herself. She served as its director for more than ten years, after which she returned to Tufts to obtain a specialty in Periodontology in 1964. Following graduation, she served on the Periodontology Department faculty at Tufts, teaching Periodontal Instrumentation well into the 2000s.

Over the course of her lifetime, Wilkins developed and presented more than 750 continuing education courses for oral healthcare professionals and presented them in the United States, Canada and countries around the world. A consummate educator, she loved teaching and spending time with dental hygiene students. At professional meetings, including the ADHA Annual Conference, she always took time to speak and be photographed with students. A highlight of the Annual Conference was the student quiz programme, Are You Smarter than Dr Esther Wilkins?

In a 2005 interview with Access, Wilkins said, “If you are a student in an associate degree programme, I encourage you to continue and pursue your Bachelor’s degree. Then move on to your Master’s degree. You must read, read, read, and keep up with the current research and literature.”

A longtime member of ADHA, Wilkins encouraged dental hygienists to join the organisation and attend its meetings. “No man is an island,” she said, “and many dental hygienists work alone. They may not have another dental hygienist in the practice that they can talk with. So volunteer — there are many opportunities to volunteer in your local dental hygiene association and in community health.”

Wilkins is mourned by countless friends and colleagues around the world.
OHASA NEWS

WESTERN CAPE

2017 is here! The OHASA Western Cape (WC) Executive and CPD Committee would like to wish all our members, as well as the members of the other branches a wonderful and blessed 2017.

OHASA is not just about taking part in seminars for CPD points and attending meetings, but social responsibility is also a manner in which we, as members of the oral hygiene profession, can give back to our communities.

With each seminar our branch decides on a cause we want to get involved with. This year we have decided to be part of Operation Smiles – an ongoing charity which one of our members suggested and which lies close to her heart. This social responsibility initiative will continue for the rest of 2017. We will take suggestions from our members for an extra community investment project for each full-day seminar at our annual breakfast meeting.

The 2017 OHASA WC calendar will begin with our annual breakfast meeting on 25 February at the España Restaurant in Burgundy Estate, Plattekloof. We will have the great privilege to have an oral hygienist from Holland to speak to our delegates about ‘Anthropology in Oral Health’. The two full-day seminars will be held on 6 May 2017 (Belmont Square, Rondebosch) and 14 October 2017 (Durbanville Conference Centre).

This year we also have the privilege to run a parallel programme for the oral hygienists at the SADA National Congress (4–6 August 2017) with international and local speakers.

We want to thank our members once again for your loyal support! We trust that 2017 will be a big year filled with opportunities for us as a branch, and that each social investment initiative we are involved with will be of great value to our profession and our communities.

Cape Town greetings,
Gail Smith (WC Chair), the Executive and CPD Committee

EASTERN CAPE

Greetings from a water-restricted PE! We did, however, have some lovely rain these past few days for which we are very grateful.

We are looking forward to an exciting 2017. Events include:

- Registration meeting: 18 February 2017 at Intercare Learning Centre, Walmer, Port Elizabeth. Our speaker for the morning will be Dr Sandra Weidner, a medical doctor with a special interest in women’s health. We also will be choosing our social responsibility beneficiaries at this meeting.

- Full-Day CPD Seminar: 20 May and 12 August 2017, both at the Radisson Blu Hotel in Port Elizabeth. More details about the CPD seminars will follow.

Some traders have booked and paid stands already, for which we are very grateful! Should your company wish to book a stand for an Eastern Cape seminar, you can contact us for more info.

Kind regards,
Mart-Marié Potgieter
ohasa.eastern.cape@gmail.com
We would like to thank our Gauteng Branch members for their continuous support and we look forward to a productive year ahead. We would also like to take this opportunity to welcome and brief our members on what we have planned for the year. Please take note of the following seminar dates, venue and themes, as discussed and agreed upon by the committee:

- 11 March (Pta): Celebrating Human Rights
- 29 July (Jhb): Don your doek or beanie!
- 7 October (Pta): OHASA goes pink!
- 28 October: AGM (Zwartkop Country Club, Clubview, Centurion)

OHASA Gauteng prides itself in making sure that all the seminars are held with a spirit of giving back to the community or a charity. Thus, for every seminar we will have a charity that we will donate something to. We are proud to note that this initiative has been a standing tradition in Gauteng. Charities are nominated by the committee or members, therefore members are welcomed to suggest or nominate a charity of their choice. This year we will close with an AGM and we would like to invite all members to participate and have their say, or at least be part of the decision-making process by supporting or disagreeing with motions brought forward on the day. Most importantly, please note this year completes the service term of the current committee. Although the current committee has indicated interest in serving another term, we would welcome the presence of additional members and therefore urge those who are interested in being part of the committee for the term starting from 2017 to declare their interest.

Well wishes for 2017
OHASA Gauteng Branch Committee

Greetings from the OHASA KZN Branch Committee
The OHASA KZN Committee wishes all our members a prosperous 2017 and a successful year ahead. In addition, we would like to thank the members for their continued support.

Our calendar for 2017:

- Level 3 Refresher First Aid Course (Save a Life College: 8 CPD Points): 4 March 2017 – 48 Treasure Beach Road, Bluff, Durban
  Cost: OHASA members: R550
  Non-OHASA members: R650
- First full-day seminar: 20 May 2017 – Balmoral Hotel
- Second full-day seminar: 21 October 2017 – Balmoral Hotel

OHASA KZN Branch is in the planning stages of implementing a fluoride and brushing programme at a special needs school. We will also select two charities for 2017 and delegates will be asked to donate needed items to these charities.

Currently we are in discussion with the Head of Department at UKZN, Discipline of Dentistry, regarding the Extended Expanded Functions Course to be offered at UKZN. We will keep our members posted regarding this matter.

Kind regards,
The OHASA KZN Branch Committee
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CLINICAL

HIV/AIDS-associated malignancies of the head and neck

1. The most prevalent form of Kaposi’s Sarcoma (KS) is seen in association with HIV and termed endemic KS.
   A. True
   B. False

2. Presence of HHV8 infection alone allows for KS initiation and progression.
   A. True
   B. False

3. In regions where HAART has been implemented successfully, the prevalence of HIV/AIDS-associated lymphomas has been found to increase.
   A. True
   B. False

Select only one incorrect answer

4. Viruses most frequently implicated in HIV-associated malignancies include:
   A. Human Papilloma virus
   B. Epstein Barr virus
   C. Human Herpesvirus-2
   D. Human Herpesvirus-8

5. Clinically oral Kaposi’s Sarcoma (OKS) typically develops according to the following pattern:
   A. Flat, hyperpigmented patch
   B. Raised, indurated plaque
   C. Endophytic lesion
   D. Ulceration, often with secondary bacterial/fungal infection

6. In OKS the most frequently affected intra-oral sites include:
   A. Floor of mouth
   B. Gingivae
   C. Soft palate
   D. Oropharynx

7. Risk factors associated with development of lymphoepithelial carcinoma of salivary gland origin in patients on HAART include:
   A. Male gender
   B. Older age
   C. Smoking
   D. Slight lower CD4 cell counts than for patients diagnosed with AIDS-defining neoplasms

Select only one correct answer

8. The mainstay of patient management for those diagnosed with KS is:
   A. Surgical excision
   B. HAART
   C. Radiotherapy
   D. Chemotherapy

9. A patient diagnosed with HIV-associated lymphoma should be referred for treatment within _______ weeks of diagnosis.
   A. 4
   B. 3
   C. 2
   D. 5

10. The preferred diagnosis for a 25 year-old, HIV+, male patient presenting with a lesion affecting the lingual tonsils and regional nodal involvement is:
    A. HPV-related oropharyngeal carcinoma
    B. EBV-related squamous cell carcinoma
    C. Merkel cell carcinoma
    D. Lymphoepithelial carcinoma of salivary gland origin

11. Prognosis of an individual diagnosed with EBV-driven lymphoma is:
    A. 24 months
    B. 30 months
    C. 12 months
    D. 18 months

ETHICS

A review of the epidemiology and an update of infection control recommendations for tuberculosis

12. In TB diagnostics, sputum smear demonstrates greater diagnostic accuracy than sputum culture.
    A. True
    B. False

13. 10% of all extra pulmonary manifestations of TB are found to occur in the head and neck.
    A. True
    B. False
Select the one incorrect answer

14. Mycobacterium tuberculosis presents a significant risk to the oral healthcare worker due to:
   A. Transmission via direct contact
   B. Lack of effective vaccination
   C. Multi- or extensive drug resistant TB
   D. Non-compliance with long-term treatment regimen

15. The clinical presentation of a mature TB-associated oral lesion includes:
   A. Tongue dorsum
   B. Regular border
   C. Rough, granular surface
   D. Erythema and oedema of surrounding mucosa

16. Differential diagnoses for oral TB include:
   A. Aphthous ulceration
   B. Malignancy
   C. Sarcoidosis
   D. Actinomycosis

17. TB of the parotid salivary gland presents as a:
   A. Firm, painful mass
   B. Draining abscess
   C. Fistulisation
   D. Facial palsy

Select the one correct answer

18. The most commonly affected site of extrapulmonary TB in the head and neck is:
   A. Cervical lymph nodes
   B. Thyroid
   C. Salivary glands
   D. Oral cavity

Periodontal treatment & allegations of neglect

19. Research has demonstrated a positive correlation between communication skills and risk of litigation.
   A. True
   B. False

20. Periodontal disease progression is sporadic. Attachment breakdown occurs at random intervals for a brief duration and at random sites in the mouth.
   A. True
   B. False

Select the one incorrect answer

21. To protect against litigation a physician should:
   A. Communicate effectively
   B. Provide access to care
   C. Administer treatment in line with what he/she (the physician) deems appropriate
   D. Establish rapport

22. Complaints lodged against a physician in relation to undiagnosed/untreated periodontal disease most frequently relate to:
   A. Treatment complications
   B. Patient unaware of a diagnosis of periodontitis
   C. Lack of information regarding sequelae
   D. If the patient was aware of his/her condition, he/she was not informed as to the severity

23. Secondary aetiological factors implicated in periodontal disease development and rate of progression include:
   A. Genetic susceptibility
   B. Host response
   C. Smoking
   D. Systemic disease

24. Effective communication allows the patient to:
   A. Be more resistant to health education messages
   B. ‘Internalise’ the problem
   C. Take responsibility for his/her condition
   D. Improves compliance with oral hygiene instructions

25. As comprehensive dental records provide evidence of the level of care provided (and thus protect against litigation), it is recommended that a clinical audit be undertaken for all patients diagnosed with moderate to severe periodontitis. Key issues that must be documented with respect to initial management include:
   A. Therapeutic interventions, provided relevant to disease status
   B. Interventions were selected on the basis of available scientific evidence, irrespective of patient characteristics and preferences
   C. Treatment intervals
   D. All of the above
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