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2 mCME Hours — Continuing Dental Education

Media CME
Great White Ultra carbide instruments
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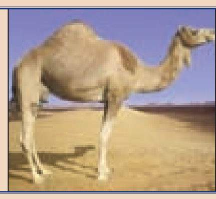

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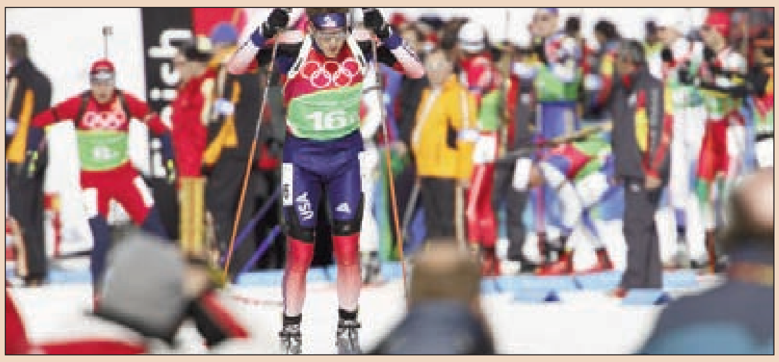
More olympians screened for oral cancer

by Lisa Townshend
DT UK



This photo shows Tim Burke (USA) competing in the 4x7.5 km biathlon relay at the 2006 Winter Olympics in Italy. Outdoor athletes like him have a higer risk of developing oral cancers. (DTI/Photo Jonathan Larsen)

LONDON, UK: Dentists have screened a fifth of all athletes taking part in the 2010 Winter Olympic Games in Vancouver, Canada, for oral cancer. Around 800 athletes sat in the dentist's chair during the competition, with more than 70 dentists and their assistants on hand not only to fix their teeth and mouths, but also to practice preventative dentistry. Dental Associations have welcomed the increased screening campaign that will also educate athletes on the importance of applying sun-cream to help prevent developing mouth cancers.

The decision to examine 20 per cent of all athletes in the Games has been taken by the International Olympic Committee. At the last Winter Olympics in Turin in Italy, only 10 per cent of Olympians were screened for oral cancer. Dental treatment services at sports events like the Olympics usually focuses primarily on treating infections and emergency trauma cases involving possible damage to teeth, lips, cheeks and tongues and broken bones.

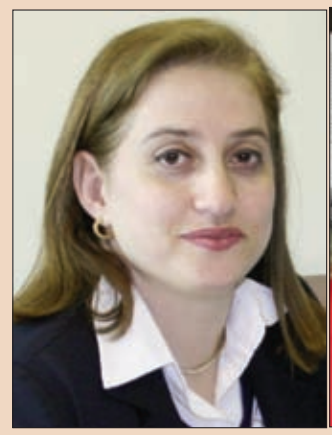
Due to their training conditions, athletes tend to neglect their oral health, Dr Jack Taunton, co-chief medical officer of the Games, said. He said that they are often so nomadic they tend to put off having dental treatment at all. Some athletes in Nordic events also chew tobacco, which contains numerous carcinogens that can cause oral cancers. More danger comes from additional reflection of ultraviolet radiation off snow and ice, raising the risk of developing skin and lip cancers.

"You have to consider they are exposed to these intense ultraviolet rays for up to 30 years, through their training and post-competitive coaching years. The skin on the lips is thin and poorly protected. " said Dr Chris Zed, associate dean of dentistry at the University of British Columbia and co-head of dental services for the 2010 Winter Games.

He added that the danger is cumulative and could lead to the development of oral cancer later in life.

Outdoor athletes seem unaware of the elevated cancer risks associated with their training, according to a German study DT

Members from University of Sharjha Win Sheikh Hamdan Bin Rashid Al Maktoum's Award to Support Medical Sciences



SHEIKH HAMDAN BIN RASHID AL MAKTOUM AWARD FOR MEDICAL SCIENCES has given two faculty members from the Medical and Health Sciences Colleges a research grants to support their research projects in the University of Sharjah. The recipients of this award are: Dr. Sausan Al Kawas, Associate professor and Head of Oral and Craniofacial Health Sciences Department at the College of Dentistry and Dr. Nisreen Tadmori, Assisstant professor at the Department of Basic and Medical Sciences, College of Medicine.

Dr. Sausan Al Kawas has received this award to support her research about the analysis of mercury concentration in the waste water released from dental clinics and its adverse effect on environment in UAE. This research project also aims to find corrective mechanisms in the disposal of mercury wastes by the dental clinics in UAE. The results of this project will contribute to the efforts of Ministry of Health to reduce the mercury burden in the waste water by monitoring restrictions involved in the handling and discharge of mercury-contaminated waste.

Dr. Nisreen Tadmori research project about genetic diseases and it will be done by studying Diabetes Mellitus in UAE children.

It is noteworthy that SHEIKH HAMDAN BIN RASHID AL MAKTOUM AWARD FOR MEDICAL SCIENCES is one of the most prestigious award in Medical Research in UAE and been awarded to more than 50 researching scientists to support their projects since 2000 till date.

HMC and CNA-Q announce partnership

As part of its educational strategy to help train the next generation of professionals in the field of dentistry, Hamad Medical Corporation (HMC) has entered into a partnership with the College of the North Atlantic in Qatar (CNA-Q) to provide a licensed supervisor under CNA-Q's Dental Assistant Program.

Speaking during the signing ceremony held in the boardroom of Hamad Women's Hospital, HMC Managing Director Dr. Hanan Al Kuwari, said:

"The agreement that is being signed is an important step in our continuous collaboration with CNA-Q to provide the highest level of education in Qatar, and to encourage our youth to pursue careers in healthcare, such as the dental profession."

Dr. Al Kuwari added that HMC is proud of its partnerships with prestigious institutions, which have benefited hundreds of students and graduates over the years. She stated further that the mutual sharing of knowledge and expertise has helped HMC achieve better healthcare outcomes for its patients.

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Does Your Patient Suffer from Dry Mouth?

What is dry mouth?

We can all suffer from dry mouth at some point, for example, if we are nervous or stressed. So most of us are familiar with the feeling of not having enough saliva in our mouth to keep it moist and lubricated. For some people, however, dry mouth can be a regular problem. As we get older we are more likely to experience dry mouth, but it's also a problem that can affect people from their 30s onwards.

What causes dry mouth?

Dry mouth occurs when the salivary glands stop working effectively. Medicines are known to cause over 60% of dry mouth cases, with more than 400 different medications linked to dry mouth. The number of medicines a patient takes is also directly related to the likelihood of experiencing dry mouth. Health conditions are also linked to dry mouth, such as diabetes or Sjögren's syndrome. People who smoke, who are pregnant, stressed, anxious or dehydrated are also more likely to have dry mouth.

What are the symptoms?

The symptoms of dry mouth can include:

• difficulty in eating, especially with dry foods, such as cereals or crackers • difficulty in swallowing and speaking • a burning sensation in the mouth • taste disturbances • painful tongue • dry, cracked, painful lips • bad breath • persistent difficulty in wearing dentures • feeling thirsty, especially at night • dry, rough tongue. Sometimes the amount of saliva a person produces may be reduced by up to 50% before these symptoms are noticed. These symptoms can sometimes have a profound effect on self confidence.

Does dry mouth cause other problems?

Saliva plays a very important protective role in the body. It not only keeps our mouth moist, it also helps to protect our teeth from decay, helps to prevent infections and helps to heal sores in the mouth.

Are your patients dry mouth sufferers? •

Do they have difficulty swallowing certain foods? • Does their mouth feel dry when eating a meal? • Do they need to sip liquids to help you swallow dry foods? • Are they taking multiple medicines? If a patient answered yes to any of these, he/she may have dry

Products to ease dry mouth

The Biotène system is specifically designed to treat dry mouth. The different products in the Biotène system allow you to choose the ones that best meet your lifestyle and dry mouth needs:

• 1 product specifically designed to help relieve your dry mouth: the gel provides long lasting relief

• 2 products to help maintain healthy teeth and prevent tooth decay in people with dry mouth: a toothpaste, with fluoride, and mouthwash which can be used twice a day in place of the usual products. These are designed to be gentle on your mouth as they are alcohol-free and don't contain harsh detergents. Biotène supplements the make-up of normal saliva to replenish dry mouths. It has a patented enzyme formulation that:

• helps supplement saliva's natural defences

• helps maintain the oral environment to provide protection against dry mouth

• helps supplement saliva's natural antibacterial system - weakened in a dry mouth. Biotène's gentle formulation is also free from alcohol and harsh detergents.

What else can a patient do to manage dry mouth? •

Sip water or sugar-free drinks often • Avoid drinks which dry out the mouth, such as caffeine-containing drinks (coffee, tea, some fizzy drinks) and alcohol • Chew sugar-free gums or sweets to stimulate saliva flow • Avoid tobacco as this has a drying effect • Use a humidifier at night to keep the air full of moisture. To help keep healthy teeth and avoid tooth decay: • Brush teeth with a soft toothbrush after meals and at bedtime • Floss teeth gently every day. If there is bleeding from gums when flossing, this could be a sign of gum disease. • Use an SLS-free, fluoride toothpaste, like Biotène, with its gentle formulation • Avoid alcohol-containing mouthwashes as these can dry out the mouth • Avoid sweet, sugary foods • Visit the dentist at least twice a year for a check-up.

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New paradigm for crown preparation: Great White Ultra carbide instruments

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By George Freedman DDS, FAACD, FACD

The standards of dental care have evolved rapidly during the past 50 years.[1] Today's best practice modalities require both tooth conservation and clinical efficiency.[2] These concepts are not always mutually compatible. The efficient and preferably rapid removal of existing tooth structures and restorative materials must be accomplished with minimal heat generation during the preparation phase.[3]

As clinical efficiency is increased with faster and more aggressive cutting tools (Fig. 1), it is clinically imperative that tooth preparation avoid the excessive heat generation that could possibly damage the remaining tooth structure and endanger the health of the pulp.[4,5]

In most clinical situations, water and air coolants are utilized in conjunction with high-speed bur preparation to reduce the risk of thermal damage to the tooth.[6] The clinical efficiency of tooth preparation is largely dependant on the shape and design of the cutting bur, and the number of steps that comprise the overall treatment.

The more often that the dentist must change burs during tooth cutting, the more time consuming the process and the less efficient the technique.

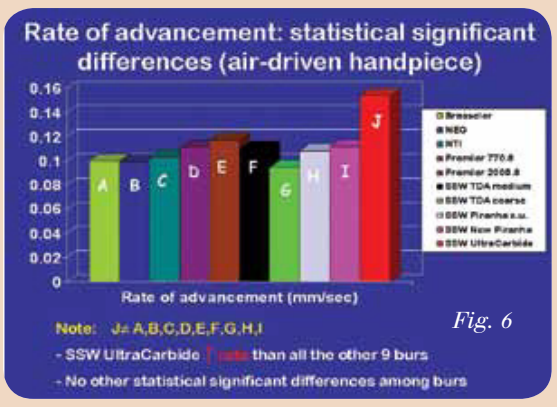


Fig. 6

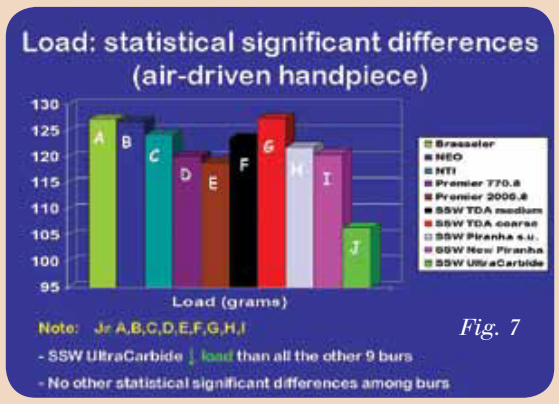


Fig. 7

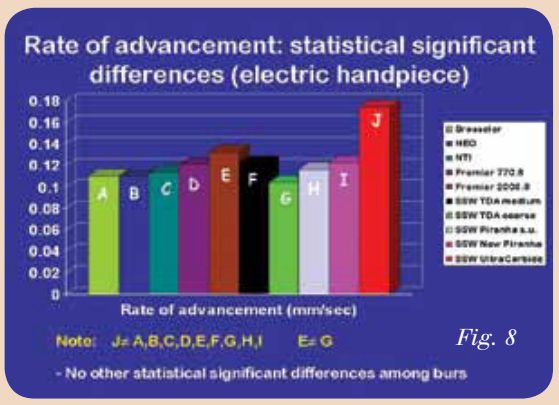


Fig. 8

Practitioners use both visual and tactile clues to determine tissues to be removed. Darker dentin is assumed to be affected by caries; it should be removed (unless, of course, it is re-hardened secondary dentin). Lightly colored dentin and enamel are presumed to be healthy tissues. For the dentist to observe color differences *during* preparation, the bur's rotation should remove debris as quickly and effectively as possible (Fig. 2).

The earliest dental burs were manufactured from a variety of metals that were harder than natural tooth structure. With time, steel became the preferred bur metal. Developments in particle-to-metal adhesion technology resulted in the first diamond burs. These burs were preferable for high-speed tooth preparation to steel.

The subsequent introduction of carbide cutting instruments was a leap forward for dentistry; carbide offered more effective tooth preparation with less surface striation than diamonds. More recently, crosscuts and innovative attack angles were introduced to the carbide cutting shank to make preparation better, faster and easier (Figs. 3a, b).

In the past, dentists have tended to favor diamond burs for extra-coronal tooth preparation while carbide burs have been used largely for intra coronal cutting.[7] The relative popularity of carbide and diamond burs varies considerably in various parts of the globe, largely due to local availability, cost and education.[8]

One factor that is often not considered by the clinician is that as diamond burs are used, their cutting efficiency tends to decrease dramatically. Their cutting diamonds tend to wear down and debris accumulates in the bur cavities (Fig. 4), reducing efficiency.[9] In order to compensate, dentists tend to press harder on the tooth with the bur in order to maintain the earlier cutting efficiency. Inadvertently, this actually *decreases* the efficiency of the procedure and increases the potential for heat formation.

Diamond burs tend to *grind* tooth structures while carbide burs CUT these same materials. This leads to the conclusion that crown and bridge preparation, where rapid and effective gross tooth reduction is required and desirable, is best accomplished with carbide instruments.

Recent research has indicated that when a crown or onlay restoration is to be bonded to the tooth surface, carbide bur preparation can improve the bond to the dentin.[10] A more effectively bonded crown increases the longevity of the restoration by decreasing leakage, and thereby the possible adhesive failure of the restoration. Carbide burs typically generate a smoother surface and the partially visible smear layer.[11]

This smear layer may be more easily dissolved and incorporated by self-etching primers, thus providing a stronger hybrid layer. This results in higher bond strengths.[12] Cross-cut carbide burs improve the retention of crowns cemented with zinc phosphate by approximately 50 percent. Thus, the use of finishing burs on axial walls is discouraged.[13]


Fig. 1


Fig. 3a


Fig. 2


Fig. 3b


Fig. 5

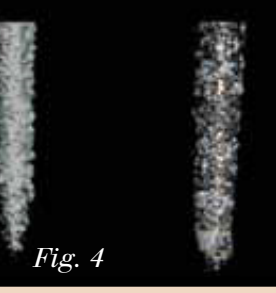


Fig. 4

Current concepts of conservative dentistry dictate that a minimum of healthy tooth structure be removed during the preparation prior to the restorative process. Natural enamel and dentin are very likely the best dental materials in existence. Tooth structure conservation is thus inherently a desirable dental objective.

Consequently, minimally invasive procedures that allow a greater part of the healthy tooth structure to be preserved are preferable (Fig. 5).[14] The patient also benefits greatly from minimally invasive dentistry. There is typically less discomfort during treatment, and a greater likelihood that the repaired tooth will last a lifetime.

The dental profession tends to take burs for granted. They are frequently used for patient treatment every day, and their effectiveness and efficiency can have dramatic impact on the practice. It is interesting to note that if the practitioner uses burs that are just 10 percent more efficient, the savings in operative time can easily increase practice billing significantly without any corresponding increase in overhead. Thus, the entire revenue increase goes directly to the bottom line.

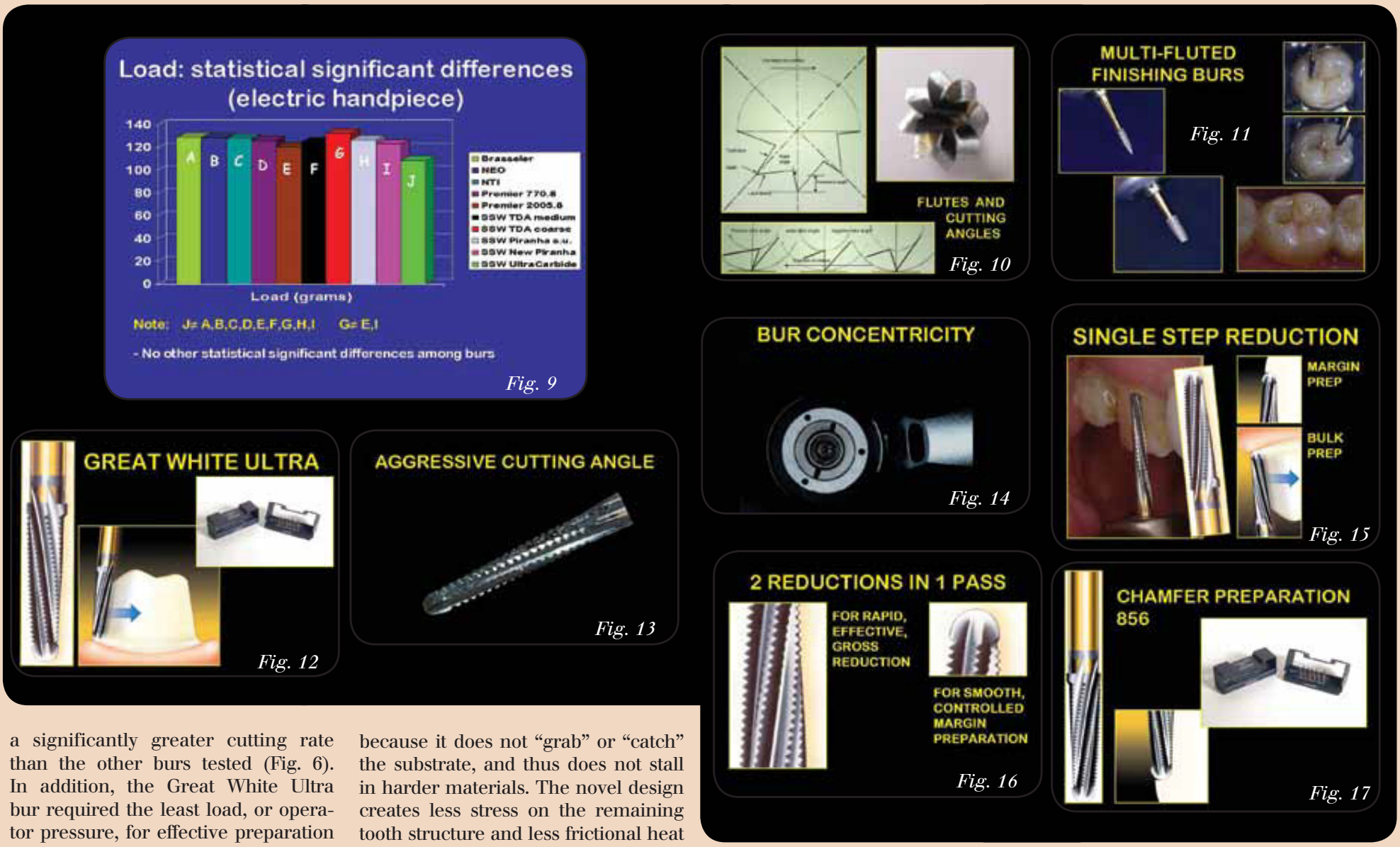
Generally, burs are one of the least expensive components of the dental armamentarium, at least relatively. A small difference in bur cost can often make a major clinical impact. The most important parameter to consider is to select the best bur for the job, keeping in mind that a small added expense of opting for a premium instrument can pay off handsomely.

Some burs are designed for single use. They can be sterilized and re-used, but often exhibit a significantly decreased cutting efficiency. Other burs are designed to be sterilized and re-used.

Recent research at the University of Rochester, Eastman Dental Center, jointly undertaken by the prosthodontic and the mechanical engineering departments, examined the efficiency of various dental burs with respect to cutting rate and load needed to complete standardized preparations in Macor samples. Both air-driven and electric handpieces were tested.

The cutting rate represents the speed at which the bur (reflecting its material composition and design) cuts through a standardized material. The faster the speed, the more efficient the preparation. The load measures the operator pressure needed to cut effectively. A higher required load will cause more operator fatigue at the end of a long working day.

In the air-driven high-speed handpiece, the SS White Great White Ultra (SS White Burs, Lakewood, N.J.) had



a significantly greater cutting rate than the other burs tested (Fig. 6). In addition, the Great White Ultra bur required the least load, or operator pressure, for effective preparation (Fig. 7).

Similar results were observed for electric high-speed handpieces. The SS White Great White Ultra had a cutting rate significantly greater than the other burs tested (Fig. 8) and required the least load, or operator pressure, for effective preparation (Fig. 9).

In practical terms, the Great White Ultra burs cut between 11–35 percent faster than the other burs tested. This can save the practitioner between one to three minutes on a 10-minute preparation procedure. The decreased load translates into greater operator comfort.

Dental bur design has developed varying flute angle and cutting characteristics that are specific to the intended task. Operative, cavity and crown preparation carbide burs have flutes (dentates) that are designed deep and wide, creating a more aggressive cutting of enamel with increased speed and efficiency (Fig. 10).

Operative burs are either straight bladed or crosscut. Straight-bladed burs cut more smoothly but are slower, particularly with harder substrates. Crosscut burs tend to cut faster, but may create more vibration. Finishing burs have more flutes, closer together and shallower, than operative instruments (Fig. 11). This design allows for fine finishing and polishing of dental materials or tooth surfaces.

The Great White Ultra bur is an innovative technological development that represents a new category of crown preparation burs; it is more sharply dentated than earlier crosscut burs. The unique geometry in the blades' design creates a bur that cuts faster with less vibration in both tooth structures and other dental materials (Fig. 12).

The bur cuts faster and smoother because it does not "grab" or "catch" the substrate, and thus does not stall in harder materials. The novel design creates less stress on the remaining tooth structure and less frictional heat that may irritate the pulp and damage the supporting periodontal structures.

The aggressive cutting angle (Fig. 13) of the Great White Ultra allows the operator to use less pressure on the tooth during preparation (resulting in decreased tooth heating and dentist fatigue). The tightly controlled parameters of manufacturing quality control develop a high degree of concentricity in the Ultra burs that offers less vibration and chatter during use, and decreased maintenance costs for handpieces (Fig. 14).

The goals of conservative tooth preparation include:[15]

1) Re-contouring the remaining tooth and restored structures to a specified shape and size to accommodate a crown.

2) Providing a depth guide on all surfaces, including the occlusal, to allow the crown to have sufficient bulk and strength to withstand occlusal and other intraoral forces.

3) Completing the preparation process with a *single pass by one bur* on the buccal, lingual, mesial and distal.

4) Creating the intended marginal finish, whether shoulder or chamfer, at the same time as accomplishing the gross preparation of the other surfaces.

5) Developing a surface that is suitable for bonding the indirect restoration.

6) Remaining conservative of tooth structure.

7) Preparing the tooth quickly and efficiently for both patient and dentist comfort.

For most dentists, the cutting speed tops the list of features that are important in selecting dental burs. Carbide manufacturers have produced a variety of designs and shapes that are intended to reduce the time that it takes a practitioner to prepare the tooth for a crown.

The Great White Ultra bur cuts quickly and smoothly through enamel. It negotiates amalgam and other restorative materials with minimal clogging and no drag or stalling in these harder materials. The bulk reduction in the crown preparation phase can be accomplished with a single instrument (Fig. 15).

The highly dentated body of the Great White Ultra cuts efficiently and quickly, and combined with the smooth tip, helps to provide two reduction actions in one single pass with a single bur (Fig. 16). The rounded, non-crosscut tip provides smooth, precise and controlled margins with the same cutting motions as the gross reduction preparation. Thus, the Great White Ultra is more efficient; there is less chair time.

There are two preferred marginal anatomies for crown preparation, the chamfer and the shoulder. Accordingly, two margin-specific clinical series of burs have been crafted. The Great White Ultra 856 Series develops a rounded axial-gingival margin providing a chamfer finish for the preparation (Fig. 17). The Great White Ultra 847 Series creates a 90 degree axial-gingival wall and provides a shoulder margin for crown restoration (Fig. 18). The Great White Ultras are available in a variety of diameters and cutting lengths.

The Great White Ultra bur kits organize a variety of shapes and sizes that are typically used in routine crown preparation. The bonus is that once the correct bur is selected, the entire preparation can often be completed without changing to another instrument. Bulk reduction AND a smooth margin are created with the same reduction instrument.

Clinical case No. 1

The preparation of the bicuspid crown is very rapid and straightforward. A single pass of the Great White Ultra bur reduces the bulk of the tooth at the height of curvature and finishes the chamfer margin simultaneously (Fig. 19). The inter-proximal preparation must be accomplished without marring the surface of the adjacent tooth. One of the thinner GWU burs may be used (Fig. 20).

The buccal surface is *not* smoothed out with a disc or diamond; the striations created by the bur increase the surface area available for adhesion (Fig. 21). The occlusal reduction is completed to provide 1.5–2.0 mm clearance for the crown (Fig. 22). The completed preparation, ready for impressions, is viewed from the occlusal (Fig. 23). The entire circumferential preparation was completed with a single Great White Ultra bur in a single pass.

Clinical case No. 2

The molar crown preparation is begun on the buccal surface (Fig. 24) and continued circumferentially as in the case above. The bulk and marginal preparations are completed at the same time. The completed preparation, ready for impressions, is viewed from the occlusal (Fig. 25).

The stone model is verified against the intra-oral preparation, and the crown is tried on extra-orally (Fig. 26). If the fit on the model is correct, then the crown is tried intra-orally and cemented on to the prepared abutment (Fig. 27).

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A circumferential preparation that has even depth throughout and adequate space for the restoration, as well as a well-defined margin (whether chamfer or shoulder), results in a well-fitting and long-lasting crown.

Clinical case No. 3

Some practitioners prefer to use depth grooves to guide crown preparation. The Great White Ultra bur is well suited to this task. The depth grooves are placed quickly and evenly to the desired preparation depth (Figs. 28a–d) at the same time that the location of the margin is determined.

The depth grooves are joined, maintaining the selected depth of the preparation and the location of the restorative margin (Fig. 29a, b). The occlusal surface is reduced to an ideal depth and shape (Figs. 29a–c) and the preparation, completed within a matter of minutes, is viewed from the occlusal (Fig. 29d).

It is reasonable to expect that Great White Ultra burs can be used for multiple tooth preparations, and that they can be cleansed effectively between patients. There are two important steps to follow for the proper sterilization of multiple-use tungsten carbide burs.

Step 1: Burs should be cycled through an automated washer such as the Hydrim (SciCan, Toronto, Canada), that provides rapid and effective washing, rinsing and drying with a single push of a button.

(The instruments may be cleaned manually, but they should be presoaked to loosen debris and handled with extreme care to avoid skin punctures. Avoid cold sterilizing solutions that contain oxidizing agents that can weaken carbide burs. Ultrasonic systems can be used as well. The re-use of solutions in these systems is less than ideal, however.

Separate the burs from each other in a bur block during ultrasonic immersion to prevent damage to the cutting surfaces. Brush any remaining debris away with a stainless steel wire brush. Rinse and dry the burs.)

Step 2: It is only at this point that sterilization can be initiated. The importance of this step cannot be overstated. Only the effective sterilization of burs eliminates the threat of cross contamination to patients and staff. Steam autoclaves will effectively sterilize carbide burs, but some units may allow surface corrosion to develop.

Metal bur blocks may promote galvanic corrosion and should be avoided. Both dry-heat sterilizers and chemiclaves can be used without corroding or dulling carbide burs.

Conclusion

Great White Ultra burs are an innovative solution for the crown and bridge tooth preparation process.

The differential reduction provided by the varied cross cutting of the bur's active surface allows intraoral multitasking.

Great White Ultras simplify the clinical procedure by reducing the circumferential bulk of the tooth and preparing the final margin at the same time.

Rapid cutting, less structural stress and a more adhesive surface are additional advantages. DT

Fig. 18

Fig. 19

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Fig. 21

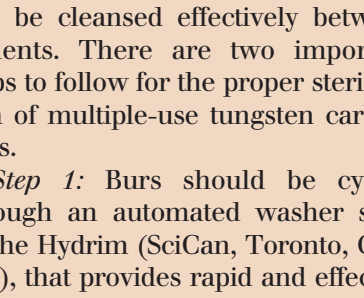


Fig. 22


Fig. 23

Fig. 20

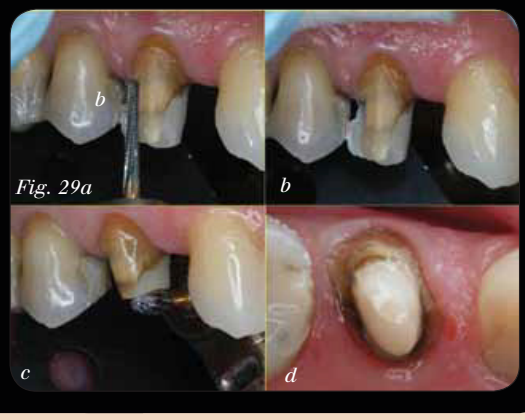

Fig. 24


Fig. 25



Fig. 26


Fig. 27



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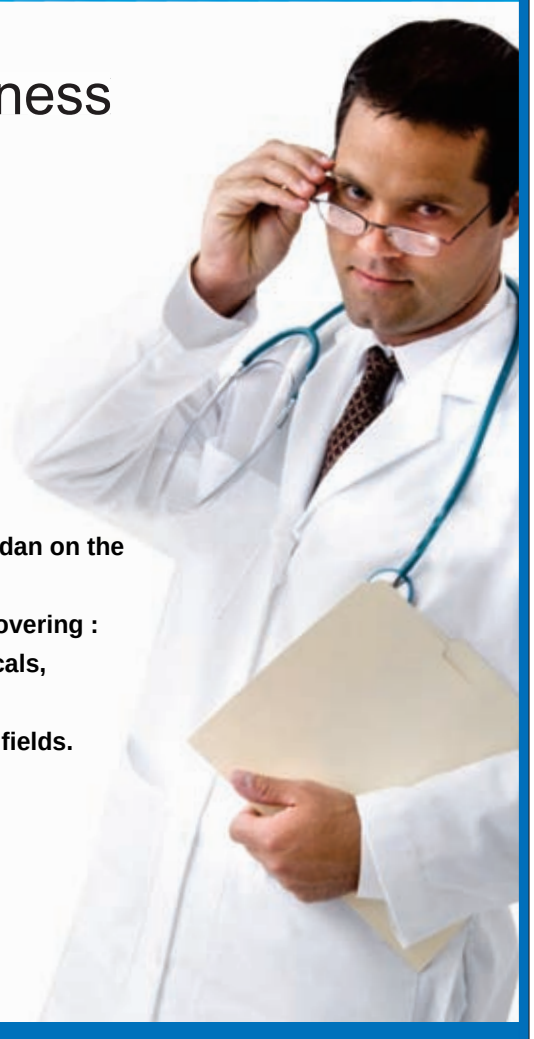

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