

# YOUR PRACTICE BUILDER

A QUARTERLY PUBLICATION OF HEALTH CARE TRUST FOR GENERAL DENTAL PRACTITIONERS

## From the Editor's Desk

Recently I happened to overhear a patient seeking a second opinion from a dentist. His first dentist had asked for a CT scan for his son's TMJ problem. He questioned whether CT scan was important for the treatment and also wanted to know the difference between a CT scan and CAT scan. As health providers if we do not know about these investigations, sometimes it may cause great embarrassment. This issue covers CAT scan and MRI, with information on situations where a dentist will need to ask for these investigations.

There is a Mumbai high court judgement saying that doctors and hospitals are obliged to provide a copy of his medical records if the patient demands. The long term aim of the judgement is to induce greater transparency in the medical profession and make doctors more accountable, leading to better healthcare. In this context it is imperative that we adopt **Evidence Based Dentistry**. The goldmine of clinical research done in past three decades have made this paradigm shift possible. The changing view is reflected in the publication of Journal of Evidence based dentistry as a supplement to the British Dental Journal.

Let us ask ourselves "Am I doing my best? Am I keeping upto date? Am I rendering the best treatment to my patients?"

Endodontic series gives some valuable nuggets of information this time. There are many situations where endodontic treatment will be of tremendous help to the dentist for preservation of the patient's

masticatory apparatus for the lifetime.

The search for amalgam replacement material is going on. We have four condensible composites in the market, which may compete with amalgam for posterior restorations. Exact color matching in esthetic restoration has been an Achilles' heel in our practice. Wolf Industries Inc. USA has come up with Dental Color Analyzer to assist us in determining the shade and color of dental materials and to precisely match these shades to the patient's original teeth.

Dr. Douglas Bratthal has visited health care trust and gone back to Sweden but the impact he left is still very palpable. People who think globally always inspire me. Why do we underestimate our role in caries prevention? Let us pledge to spread the message on caries prevention through each and every patient who visits our clinic.

Dr. Beena Rani Goel, MDS

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## CAT Scan and MRI

### Computed Tomography

CT was first invented in 1972 and became widely available by about 1980. There are now about 6,000 CT scanners installed in the U.S. and about 30,000 installed worldwide. CT can provide detailed cross sectional images and diagnostic information for nearly every part of the body. Computed Tomography (CT) imaging is also known as "CAT scanning" (Computed Axial Tomography).

CT imaging combines the use of the digital computer and a rotating x-ray device to create detailed cross sectional images or "slices" of the brain, spine and body for the first time. CT allows physicians to image soft-tissue anatomic structures like the brain's ventricles or gray and white matter.

Conventional x-ray imaging can **only** show the dense bone structures of the skull and spine, and the more sophisticated x-ray technique called the angiogram depicts only the blood vessels of the head and neck and not the soft brain-tissue. CT has the **unique ability** to image **all three**: soft tissue, bone, and blood vessels.

After the examination the physician can **selectively** "window" the digital image on the computer screen to look at the soft tissue, then the bone and then the vessels, as needed.

The produced images are cross-sectional and their pattern can be compared with slices of a loaf of bread. The examination **time** depends upon area of the body being viewed and can be from 15-20 minutes to 2 or 3 hours. By taking a series of such images, a CT can create a multidimensional (3-D or three dimensional) view of the body. Now the whole loaf of bread can be seen! The quality of this multidimensional view enhances the radiologist's ability to **accurately diagnose** different pathological conditions.

3-D image reconstruction also permits three-dimensional processing and display of CT image data for surgical planning, such as orthopaedic prosthesis, or **facial-cranial** reconstruction. (3-D CT is an invaluable tool for surgical reconstruction following facial trauma). It is also useful in cases of cleft lip and palate to see how much bone is actually present.

Head scanning looks at the skull bones for possible fracture, brain for possible stroke, bleeding, or abscesses and evaluates the jaws before implant installation.

**MRI** (Magnetic Resonance Imaging)  
- an expanding imaging technology.

Magnetic resonance imaging is a new technology that is a powerful diagnostic tool for different pathologic conditions. It provides more precise tissue contrast and anatomic details than many other radiographic methods. The image is created by means of magnetic fields and radio frequency pulses and is thus, as far as we know today, harmless for mankind, while all conventional radiographic methods have a drawback—an ionizing effect on the tissues, with a biological risk.

The following is a very simple description of how it works: The main components of a MRI system include a magnet, radio frequency transmission and receiving coils and a computer.

The MR images are created under the influence of a strong magnetic field in which the patient is lying. When the patient is placed in this, the proton of the hydrogen nucleus of the body (as all other protons) becomes oriented either parallel or anti-parallel to the magnetic field (the charge and the spin of the nuclei causes them to behave like magnets). Hydrogen nuclei exist in the water in our body, which means in all tissues, but more in the soft tissues than in the hard tissues.

Radio frequency (RF) energy is then transmitted to the body and the body area of interest. When energy in the form of radio waves is added to the patient, the low energy state of the protons can change to a new high energy state. The radio frequency used is very specific and is called the Larmor Frequency. When this RF pulse is turned off, the protons will release the energy they absorbed. The protons now want to straighten themselves in the longitudinal direction, where they were in the first place.

To create an image of this released energy and its impact on the protons, the source and strength of the signal must be determined. This is performed by means of radio receiver coils, which detects the signal and the image can be built up.

The MR signal is dependent not only on the presence

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## Evidence Based Dentistry

The treatment rendered by us in our day to day clinical practice- has it any scientific basis?

Information given in books is several years old by the time it appears in print. Are we applying the scientific knowledge gathered by thousands of studies and trials? This question has become more relevant than ever before in view of the increasing consumer awareness campaigns.

Evidence-Based Medicine, whose philosophical origins extend back to mid-19th century and earlier, remains a hot topic for clinicians, public health practitioners, purchasers, planners, and the public. **British centers** for evidence-based practice have been established in adult medicine, child health, surgery, pathology, pharmacotherapy, nursing, general practice, and **dentistry**.

The Cochrane Collaboration and the York Center for Review and Dissemination in York are providing **systematic reviews** of the effects of health care; new evidence-based practice journals are being launched; and it has become a common topic in the lay media.

1. Evidence-based medicine is the conscientious, explicit and **judicious use** of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating **individual clinical expertise** with the best **available external clinical evidence** from systematic research. Good doctors use both individual clinical expertise and the best available external evidence, and neither alone is enough.

2. Evidence-based medicine requires **new skills** of the physician, including **efficient literature searching**, and the application of formal rules of evidence in evaluating the clinical literature.

3. The influence of evidence-based medicine on clinical practice and medical education is increasing.

The foundations of the paradigm shift lie in developments in clinical research over the last 30 years. In 1960, the randomized clinical trial was an **oddy**. It is now accepted that **virtually no drug** can enter clinical practice without a demonstration of its efficacy in clinical trials. Moreover, the same randomized trial method is increasingly being applied to several treatment therapies, and diagnostic tests.

**Meta-analysis** is gaining increasing acceptance as a method of **summarizing the results** of a number of randomized trials, and ultimately may have as profound an effect on setting treatment policy as have randomized trials themselves. While less dramatic, crucial methodological advances have also been made in other areas, such as the assessment of diagnostic tests and prognosis.

*A new philosophy of medical practice and teaching* has followed these methodological advances. This paradigm shift is manifested in a number of ways.

There has been a number of articles instructing clinicians on **how to** access, evaluate, and interpret the medical literature.

Proposals to apply the principles of clinical epidemiology to day-to-day clinical practice have been put forward.

A number of major medical journals have adopted a more informative structured abstract format which incorporates issues of methods and design into the portion of an article the reader sees first. British dental journal has started **Journal of Evidence based dentistry** from NOV. 1998 (as a supplement to BDJ).

### Requirements for the Practice of Evidence-Based Dentistry

The practice, and teaching of evidence-based dentistry requires skills that are not traditionally part of our training:

1. precisely defining a patient problem
2. what information is required to resolve the problem
3. conducting an efficient search of the literature
4. selecting the **best of the relevant** studies, and applying rules of evidence to determine their validity
5. Extracting the clinical message, and **applying it to the patient problem**.

Evidence-based medicine also involves applying traditional skills of medical training.

## Endodontics in Restorative dentistry

Restorative dentistry aims to preserve the masticatory apparatus for the lifetime. In quite a number of patients, this goal is extremely difficult to attain without endodontics.

1. Retaining involved teeth with large restorations. Many complex procedures are available now for restoring badly broken down teeth. The use of such procedures may result in some irreversible damage. Even though direct pulpal exposure is avoided, sufficient pulpal damage may accrue, to cause a severe pulpitis or pulpal death. Having spent considerable time, effort and money to save a tooth, contemplating extraction is difficult for both the dentist and the patient. Such a tooth should be retained by endodontic treatment. Prepare the access directly through the existing restoration. If cuspal coverage is already present, after the root canal treatment, use a reinforcing post.

**When the ratio between the number of missing teeth in an arch and the number of retained teeth in the same arch approaches one to one, removable partial denture is indicated.**

2. Retain involved anterior teeth when diastema is present. Don't opt for removal of an anterior tooth and replacement with fixed partial denture. Though this may be a simple procedure, when the involved arch has natural diastema, the esthetic result will be poor due to over contouring and excessive width of each tooth in the bridge. By treating the tooth endodontically and restoring it with a post and core jacket crown, better results can be achieved.
3. Avoid the use of mandibular anterior teeth as abutments, by doing endodontic therapy of the pulpally involved tooth and saving them.
4. Save the irreplaceable tooth. Always efforts should be directed at saving the most posterior tooth in any dental arch, since they can't be replaced easily with fixed prostheses. Moreover, supra eruption of the opposing tooth will cause extraction of that tooth as well.

When two adjacent teeth are involved, attempt treatment for both. If, for financial reasons or due to some other

cause, only one may be saved, take time to decide which one is to be retained. If one is extracted first and the retained one proves to be untreatable, you will end up in a very difficult situation.

5. Preserve enough remaining teeth for use with a fixed partial denture.

When the ratio between the number of missing teeth in an arch and the number of retained teeth in the same arch approaches one to one, removable partial denture is indicated.

The presence of multiple teeth requiring root canal treatment in one arch should not be a stumbling block. There are successful cases of quadrants where all teeth are root canal treated.

6. Limit the extent of the problem

When an involved tooth in an intact quadrant is extracted, the adjacent teeth must be prepared as bridge abutments, with possible resultant problems. If that involved tooth is given endodontic treatment, adjacent teeth remain uninvolved in the subsequent

restorative procedures. The extent of the problem is thus limited to only the involved tooth.

7. Minimising the length of bridge span. Root canal treated teeth can serve as bridge abutments as well as vital teeth. By endodontically treating (instead of opting for extraction) pulpally involved teeth adjacent to an edentulous area, a reduction in the length of bridge span can be achieved. This reduces periodontal strain and possible damage to the abutment teeth.
8. Avoid the loss of bridge abutments. Continued pain after bridge cementation usually dictates the need of root canal treatment. Consider the abutment tooth as a tooth with an extensive restoration and gain root canal access directly through the casting. After completion of root canal treatment, a reinforcing pin or post may be utilized to retain the previously placed crown.

Ref.

Franklin S. Weine: Endodontic Therapy. Ed. 5, Singapore 1996, Mosby p15-22

## ORAL CANCER (contd. from last issue)

### Dentist's Role in Prevention:

All dental practitioners should routinely ask their patients about tobacco and alcohol habits and counsel them to quit tobacco and moderate alcohol use, or refer them to appropriate agency. Dentists should also advise on healthy eating. Evidence is mounting that tobacco use is harmful to oral health, especially periodontal health, and that smoking status is an important factor in the prognosis for several therapies, including periodontal therapy, wound healing, implant dentistry and cosmetic dentistry.

1. Ask: About tobacco use. Implement an office wide system to ensure that tobacco use status is obtained and recorded for every patient at every office visit.
2. Advise: Tobacco users to quit. In a clear, strong and personalised manner, urge every smoker and spit tobacco user to quit.
3. Assist: interested patients with a plan to quit. Advise each patient to set a quit date, ideally within 2 weeks, inform friends, family and co-workers, of plans to quit and ask for support; by removing tobacco products from home, car and workplace and avoid smoking in these places; review previous attempts to quit, what helped and what led to the relapse, and anticipate challenges, particularly during the critical first few weeks, including nicotine withdrawal.

Give advice on successful quitting-

Total abstinence is essential -not even a single puff.

Drinking alcohol is strongly associated with relapse.

Having other smokers in the household is not desirable for successful quitting.

4. Arrange follow-up contacts. Successful quitting is at least double when there are follow up contacts. Follow up should begin within the first few days after a patient's quit date and be spaced over the first three months ( this is the interval when most relapse occurs)
5. Nicotine Replacement Therapy (NRT)

Trials have shown that the use of NRT decreased the proportion of people smoking by around 12% in more motivated patients who were self-referred. In all these studies some form of additional support, ranging from brief advice to more intensive forms of counseling, was provided alongside the NRT.

NRT is available in a number of forms, such as transdermal patches, chewing gum, nasal spray and inhalers. In the most heavily dependent smokers (i.e. those craving a cigarette on waking and/or who smoke more than 20 cigarettes per day), higher dose nicotine gum (4mg) is more effective than 2mg gum or nicotine patches.

### Condensable Composites

The advertisements certainly make them sound like ideal restorative materials. Currently there are four "condensable" resin composites on the market: SureFil (Dentsply/Caulk), ALERT (Jeneric/Pentron), Solitaire (Heraeus Kulzer), and Pyramid (Bisco). They were developed within the last year and are sold as alternatives for amalgam in restoring posterior teeth. Amalgam, as most dentists are aware, has come under increasing scrutiny because of its alleged hazardous properties. Although scientific evidence is lacking to prove it is hazardous for patients, environmental concerns are making its disposal a problem. Because of these issues, manufacturers have turned their attention to developing and marketing resin composites that, they claim, have several characteristics that make them esthetic amalgam alternatives. First, these "condensable" or "packable" resins can be placed into a preparation and condensed as if they were amalgam. That may be an oversimplification, because they are still resins and handle like resins. But, because they are relatively highly filled with either differing sizes of filler particles (Pyramid) or with fiber (ALERT), porous (Solitaire), or irregularly-shaped (SureFil) filler particles, they resist condensation to an extent and are purported to be amalgam-like in their packaging and handling properties. Two of the products, ALERT and SureFil, have the resin packaged in blister packs that differ by spill size. They also come with amalgam carriers that the clinician uses to place them into the preparation. They all can be packed with amalgam condensers and are used with traditional metal matrix bands and wooden wedges. Because they are more viscous and packable than standard resin composites, it is a bit easier to achieve acceptable interproximal contacts with them compared to traditional resin composites. Wear rates are supposedly similar to that of amalgam (about 3.5 microns/year), however, it should be noted that a study presented at a recent dental research meeting found a much higher wear rate for Solitaire (Flessa

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## Visit of Douglas Bratthal

Dr. Douglas Bratthal, a Swedish Scientist is chief of WHO's collaborating center on Dental Caries. He formulates plans for dental caries prevention and has visited over 60 countries to help them develop national plans.

He was invited to speak on "caries risk assessment" at the national dental conference at Bangalore, Jan 1999. He also visited the Health Care Trust, which has as one of its aims 'caries free India'. Following are the excerpts from the discussion with him.

In India, the consumption of sugar has increased from a few kilos to 40 or 50 kilos a year in a family, bringing about a change in the oral environment. The change in oral microbiology alters the body's defense system and more aggressive bacteria gain foothold.

According to Dr. Bratthal, some of the countries that are badly hit by dental caries are,

- South American countries like Brazil,
  - East European countries like Poland,
  - Some of the former Russian States and former Yugoslavia.
  - Japan had a high caries rate. It is going down rapidly now, after they have started the use of fluoridated toothpaste.
  - China has some areas where dental caries is high, but generally it is low because the sugar consumption is low.
- In India, dental **caries is on the rise** since the sugar consumption is steadily increasing here since the last 50 years.

Dr. Bratthal and his team are sent by WHO on special missions to various countries. They review the country's national plans, give demonstrations, complete projects, give suggestions and explain what other countries have achieved by adopting the caries preventive methods.

About dental decay in his mouth, he answered that he had some old fillings, but since last 30 years there are no active carious lesions. In his family, when he noticed early signs of caries in his daughter's teeth, extra fluoride applications were given to arrest them. He is of firm opinion that resistance of the tooth surface has to be increased through fluoride incorporation, to keep away dental caries.

To the sensitive question whether he has reached the ultimate goal in caries prevention, he said the answer is 'yes' and 'no'. 'Yes', because if a person is having high caries rate, he can definitely be helped. But he must go to the dentist's office every week for professional cleaning and fluoride application.

The "no" component of the answer is because the cost in such a case will be high, making it unavailable to many patients in developing countries. The greatest problem is for patients with xerostomia. The dentist has to be literally by their side to keep dental caries away.

If such dental service can't be afforded, doesn't it mean that there is no hope for caries prevention in a country like India?

Oh no, things are not so gloomy. The cited examples were extreme cases. A good percentage of the population can be helped if they brush their teeth at least twice a day (after breakfast and after dinner) with fluoridated toothpaste and get a professional cleaning done once a year by a dentist. Children under the age of seven years and people living in areas where the drinking water contains fluoride should not use fluoridated toothpaste. This message has to be spread by education through media and school programmes. Caries prevention has to be included in the list of priorities for the country.

We have many advertisements for chocolates and other sticky foodstuffs. These foodstuffs when taken as snacks in between meals, they stick to the grooves in teeth, remain there for hours and lead to dental decay. If they are taken before the main meals, while chewing the food, teeth surfaces get cleaned. Also, the number of times a person consumes sweets is directly related to caries incidence. It is normal to have craving for sweets. But don't take them more than twice a day. Forceful rinsing after each meal has to be practiced.

Dr. Bratthal is of the opinion that all countries should have programmes with emphasis on school children. According to him, future research should be aimed to make things simple, affordable and to reach out to as many people as possible. The trend to cut big cavities for fillings should be stopped. In Sweden, dentists are already using solutions like 'carisol' to dissolve the carious portion away, doing away with the 'drilling' before fillings.

We asked him his opinion on the **caries vaccine** that the British Scientists are aiming to market by the year 2001 or 2002. Dr. Bratthal said that he would be happy but surprised if it is marketed by the year 2002. Within this short span of time, they cannot have long term investigation on how they work. Only a few short term studies on limited population can be completed, which means it will be a type of test vaccine.

Also, consider this fact- the vaccine is prepared for a particular oral environment. The dietary pattern is continuously changing and sugar consumption is on the rise, changing the oral environment. The oral microbiology alters the whole defense system and more aggressive bacteria establish themselves. So, for the time being, it is night brushing, fluoride toothpaste, mouthwashes (where drinking water is not fluoridated), and limiting consumption of sweets to twice a day.

**Note:** Prof. Bratthal has developed Software based on cariogram concept. This windows based (win 95 & 98) software is useful for dentists and also for patient education. You can get a copy of this software from us by sending a DD for Rs.500/- favoring Health Care Trust (includes cost of floppy & postage)

**Cont. from p. 2**

or absence of hydrogen but also to whether hydrogen is bound tight or loosely within a molecule. Hydrogen in bone is tightly bound and the signal from bone will not be usable while hydrogen in liquids will tilt and a detectable signal is received. The higher concentration of loosely bound hydrogen nuclei we have, the more intense signal and brighter MR image we will have. Therefore, the **soft tissues** of the body are best viewed in a MR image.

Due to its excellent soft tissue contrast resolution, MRI has proved to be useful in imaging of the salivary gland parenchyma, nerves, spinal cord, different other soft tissue lesions including tumours, internal derangement of the TMJ including the position of the disc and osteomyelitis in the jaws.

In the future a lot of new fields of application will show up for MRI, which is relatively a new technology.

Source- Internet

**Opportunity available to go as exchange visitor to the Maxillofacial Dept. at a Dental School in South Africa. For further details contact Health Care Trust.**

**Cont. from p. 5**

et al, J Dent Res 1998;77:237). Another important claim that their manufacturers make is that these resin composites can be placed in bulk and light activated because they shrink less than other resins. In fact, Dentsply/Caulk and Jeneric/Pentron claim that their products can be placed in 5-mm thickness prior to light activation. If true, this would simplify placement and reduce chair time. However, preliminary work indicates that 5-mm thickness of two of the condensable resin composites (SureFil and Solitaire) are not adequately polymerized by a 40-second light exposure.

Although some steps in their placement are like those of amalgam, other aspects are the same as those of traditional resin composites: they come with dentin bonding agents that are used to establish a micromechanical bond between the resin composite and tooth structure and they are finished and polished like other resin composites.

Additional research needs to be performed by independent researchers and clinicians to assess the validity of the claims made for the condensable resin composites. It is advisable to either not use them or use them conservatively until more research has been published on their performance. One thing you can be sure about: more of these products will be marketed in the future.

**Dental Colour Analyzer**

Recent years have seen an increasing demand for cosmetic and reconstructive dentistry. Technical aspect for this type of dental treatment requires determination of surrounding tooth colour, proper selection of materials, and colour consistency under all types of lighting. These steps were so far done on a subjective basis since no scientific methodology was available.

Colour metamerism, which is a feature of human vision, makes it difficult to match colour under different lighting conditions. For e.g. the mixture of pigments used for an artificial tooth look natural under an incandescent light, yet may look quite unnatural in daylight.

The patented Dental Colour Analyzer (Wolf Industries Inc. USA) was developed to assist the dental professionals by determining the shades and colour of dental materials used in restorative work and precisely matching these shades to the patient's original teeth.

Dental Colour Analyzer is designed to discriminate between the most minute differences in the tooth colour and determine the best match for patient. The device takes account for metamerism i.e. differences in colour perception of specially unmatched materials when illuminated with different light sources such as sunlight, fluorescent lamps, and incandescent lamps.

The device can be equipped with a serial port to allow patient's colour data to be transferred to a personal computer for electronic filing with other patient records.