

## Get to Know Us. Meet Our Doctors

# THE BETTER ROOT



Dr. **Elie M. Wolfson**  
D.D.S., F.R.C.D.(C)

Dr. Elie Wolfson graduated from his endodontic program at Temple University in Philadelphia in 1973. He is a Board certified specialist in both the US and Canada. He has been an examiner of endodontic specialists for over 30 years for the Royal College of Dentists of Canada and has served as President, Councillor and Chief Examiner over this time. He was an Associate Professor of Graduate Endodontics at SUNY at Buffalo for 15 years.

He is a member of the Canadian Academy of Endodontics, the American Association of Endodontists, the Ontario Society of Endodontists, the Canadian Dental Association and the George Hare Endodontic Study Club.



Dr. **Wayne H. Pulver**  
D.D.S., Cert. Endo.

Dr. Wayne Pulver received his Certificate in Endodontics from the Harvard School of Medicine in 1976. Dr. Pulver is presently the head of the endodontic section of Mount Sinai Hospital. Dr. Pulver has served as President of the Ontario Society of Endodontists, Canadian Academy of Endodontists, George Hare Endodontic Study Club, as well as the Ontario Dental Association. He has received numerous awards and distinctions and authored a variety of clinical and scientific articles in endodontics. Dr. Pulver has lectured extensively and serves as a member of the Real World Endo's Board of Advisors.



Dr. **Marc M. Factor**  
D.D.S., M.S., Cert. Endo.

Dr. Marc Factor received his specialty training in Endodontics in 1995 from SUNY at the Buffalo School of Dental Medicine, paired with a Master of Science in Oral Biology.

Dr. Factor currently serves on the executive council of Alpha Omega Dental Society and holds an Attending Staff position at Mount Sinai Hospital, where he gives lectures and assistance to dental residents. He is involved in continuing education organizations including the George Hare Endodontic Study Club, the Ontario Society of Endodontists and the American Association of Endodontists. Dr. Factor has taught at the University of Toronto as an undergraduate clinical instructor and was President of the York Region Dental Society.



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## Nutraceuticals Show Promise in Oral Cancer Therapy

Two nutraceuticals -- green tea extracts and resveratrol -- have shown promise in treating various cancers, including oral squamous cell carcinoma (OSCC). But the limited availability of these plant-derived dietary compounds, along with inadequate targeted delivery mechanisms, poses a challenge to their widespread adoption, according to a new study in *Oral Oncology*.

Research has shown that nutraceuticals have the potential to treat various cancers because of their broad chemical diversity, multi-targeting action, and safety. Some nutraceuticals are now in clinical trials, while others have already been approved for use with humans.

Green tea contains polyphenols with antioxidant properties, and multiple studies have pointed to its antitumor properties. The polyphenols have been extensively investigated for their therapeutic potential in human malignancies, including head and neck squamous cell carcinoma (HNSCC).

Resveratrol is a phytoalexin naturally produced by a variety of plants, such as grapes and peanuts. Resveratrol has attracted increasing attention since 1992, when it was associated with the cardio-protective effects of red wine consumption.

**Contemporary research has provided evidence to confirm that combating cancer with nutraceuticals shows promise. More clinical trials are needed with nano-formulated nutraceuticals to evaluate the feasibility and clinical uses.**



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## What is Regenerative Endodontics?

Regenerative Endodontics (RE) is a breakthrough development in endodontics based on principles of regenerative medicine and tissue engineering.

Historically, long-term calcium hydroxide treatment or mineral trioxide aggregate (MTA) was used to induce apexification of the immature tooth with pulpal necrosis before placing an obturation material in the root canal system. However, neither apexification treatment fosters further root development, so immature teeth remain vulnerable to cervical root fractures. In contrast, RE therapy has the potential for continued root development, and may confer a better long-term prognosis. In addition, successful regeneration of the pulp-dentin complex would likely result in vital tissue capable of mounting an immune response by signaling tissue damage by sensory neurons.

RE fuses three key elements of tissue engineering: **stem cells**, **scaffolds** and **growth factors** to treat complex cases.

**Stem cells** are undifferentiated cells that continuously divide. Embryonic stem cells are capable of developing into more than 200 cell types.

**Scaffolds** provide support for cell organization, proliferation, differentiation and vascularization.

**Growth factors** are proteins that bind to cell receptors and act as signals to induce cellular proliferation and/or differentiation.

A recent article in the *Journal of Endodontics* presented successful clinical outcomes in landmark RE cases following revascularization procedures for immature permanent mandibular premolars with pulpal necrosis and periapical infection.

A contributing factor to the overall clinical successes is the expansion of various branches of stem cell research. The discovery of mesenchymal stem cells, with the potential to differentiate into odontogenic-like cell lines, increased the potential for therapeutic applications. Recent reports describing the presence of mesenchymal stem/progenitor cells with regenerative capabilities have been found in human inflamed pulps and periapical tissue. This presents intriguing possibilities for future treatment of the mature tooth with pulpal necrosis and apical periodontitis.

**Future developments in regenerative endodontics promise improved outcomes in the retention of natural dentition—always the ultimate goal of endodontic treatment.**

Learn more online.  
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## Articaine Better in Supplemental Infiltrations for Pulpitis

Supplemental infiltration injections with articaine are more effective than the same type of injection with lidocaine after initial failure of an inferior alveolar nerve block, new parallel studies show.

Hengameh Ashraf, DDS, of the Department of Endodontics, Shahid Beheshti Medical University in Tehran, Iran, and colleagues found that supplemental articaine infiltrations adequately controlled pain in 71% of patients undergoing root canal therapy for irreversible pulpitis in posterior mandibular molars, whereas supplemental lidocaine infiltrations worked in only 29% of patients. **"Articaine seems to raise anesthetic success more effectively compared with lidocaine," the authors write in their January 2013 article in the *Journal of Endodontics*.**

Previous studies have also examined infiltration in asymptomatic teeth. Some have found no significant differences between the two drugs, whereas others have found articaine to be superior. There were no significant differences between men and women.

Some studies have found a higher incidence of paresthesia in the inferior alveolar nerve after the use of articaine and other anesthetics in which the active ingredient is used in a 4% concentration. None of the participants in this study experienced such symptoms.

## Which Dental Materials Conflict with the Use of MRI?



A growing body of research has demonstrated the potential for magnetic resonance imaging (MRI) in clinical dentistry, including endodontics, prosthodontics, and orthodontics. Yet there has been little analysis of how dental materials in a patient's mouth may affect the end result, according to a new study in *Dentomaxillofacial Radiology*.

Contradictory results have been reported regarding the severity of image artifacts caused by different dental materials. "Magnetic susceptibility information is not readily available for many materials used in dentistry, especially those containing several components," wrote the study authors, from the University of California, San Francisco.

Using a 1.5-tesla MRI system and spin-echo and gradient-echo pulse sequences, the researchers investigated the potential influence of metal, ceramic, polymer, and composite dental materials on MRI. They then applied the geometric method to determine the magnetic susceptibility of the materials, and classified the materials based upon their degree of compatibility with MRI.

"The tested materials showed a range of distortion degrees," the study authors wrote. This could be because manufacturers of these products often use iron oxide pigments, and "the smallest contamination by ferromagnetic substances can drastically alter the susceptibility of a magnetically compatible material," researchers noted.

Julian Boldt, PhD, of the University of Würzburg and co-author on the *Dentomaxillofacial Radiology* study, says he and his colleagues are close to completing a prototype of a dedicated dental MRI scanner with the potential for therapeutic applications in dentistry, such as digital impressions. His team recommends regulatory standards requiring the magnetic susceptibility value limit for dental materials be within quantifiable magnetic compatibility limits.

## Blood Test May Predict HPV-Related Oropharynx Cancer

National Cancer Institute researchers have found that antibodies against the human papillomavirus (HPV) may help identify individuals who are at greatly increased risk of HPV-related cancer of the oropharynx.

In their June 2013 study, the *Journal of Oncology* reports that at least 1 in 3 individuals with oropharyngeal cancer had antibodies to HPV, compared with fewer than 1 in 100 individuals without cancer. When present, these antibodies were detectable many years before the onset of disease.

Incidence of oropharyngeal cancers is increasing in many parts of the world, especially in the U.S. and Europe, because of increased infection with HPV type 16 (HPV16). HPV E6 is one of the viral genes that contribute to tumor formation. Previous studies of patients with HPV-related oropharynx cancer found antibodies to E6 in their blood.

These findings raise the possibility that a blood test might one day be used to identify patients with this type of cancer.

## Genetics-Based Risk Assessment for Personalized Dental Care

A recent study conducted by Interleukin Genetics, Inc. gives new insights into the prevention of adult periodontal disease. The clinical application of risk-based genetic assessment represents a significant advancement in the personalized delivery of preventive dental care. Personalized prevention evaluations are possible based on an identifiable genetic marker, IL-1, which research indicates predisposes patients to periodontal and various inflammatory diseases.

The research explored the influence of three key risk factors for periodontal disease: smoking, diabetes, and genetics on tooth loss given varied frequencies of preventive dental visits that included cleanings.

By examining claims data from 5,117 patients without periodontitis throughout a 16-year period and conducting concurrent genetic testing, researchers determined that patients with genetic variations of the IL-1 genotype, or one or more other risk factors examined, were at significantly increased risk for tooth loss. The IL-1 genetic variation was the single most prevalent risk factor with nearly one in three Americans carrying this genetic variation.

"Personalized medicine is an important frontier in healthcare driven by the clinical application of genetic and molecular information. Genetic-based risk assessment has long promised to improve prevention and treatment of chronic diseases," said Sir Gordon Duff, Professor Emeritus of Molecular Medicine the University of Sheffield and co-author of the paper. "The findings of this study represent perhaps the first broad scale application of genetics to help prevent a disease that is very prevalent, costly and preventable."

Periodontitis initiation and progression is driven by two factors: bacterial plaque that initiates the disease and the body's inflammatory response to bacteria which, when overly aggressive, causes breakdown of the bone and tissue that support the teeth. This inflammatory response varies greatly within the population and is significantly impacted by individual genetic makeup. Genetic testing can identify patients who have an increased inflammatory response to oral bacteria and an increased risk of periodontitis. Smoking and diabetes also contribute significantly to the risk of periodontal disease.

***This study underscores the need to adopt a genetic, risk-based approach to periodontal disease management. It also gives patients a compelling reason to visit a dentist for a comprehensive periodontal evaluation. Understanding genetic predisposition to disease is a critical component of long-term prevention.***



*Genetic testing can identify patients who have an increased inflammatory response to oral bacteria and an increased risk of periodontitis.*

## Damaged Tooth Enamel Linked to BPA Exposure

Exposure to bisphenol A (BPA) early in life may damage tooth enamel, suggests a French study on rodents. BPA is a ubiquitous chemical compound widely used to manufacture food containers such as bottles or babies' bottles—and dental resins.

The researchers exposed rats to BPA daily from conception until day 30 or 100. At day 30, the teeth showed signs of molar-incisor hypomineralisation (MIH), with an abnormal accumulation of organic materials. Analysis of the damage shows numerous characteristics that are common with a recently identified pathology of tooth enamel that affects roughly 18% of children between the ages of 6 and 8.

The researchers suggest that BPA may affect the process of enamel formation or amelogenesis, by disrupting removal of the proteins that form a scaffolding for enamel.

In 100-day-old rats, the incisor enamel was normal, "suggesting amelogenesis is only sensitive to MIH-causing agents during a specific time window during development (as reported for human MIH)," write the researchers. "Because human enamel defects are irreversible, MIH may provide an easily accessible marker for reporting early BPA exposure in humans," they add.

***Recent studies have shown that this industrial compound has adverse effects on the reproduction, development and metabolism of laboratory animals. It is strongly suspected of having the same effects on humans.***