Dental Implants: Placement, After Care, and Patient Expectations

Dental Implant Placement

Dental implant therapy in the anterior region is an effective and evidence-based procedure which is frequently sought by patients for reasons of health, function, or esthetics. The clinician is faced with the task of identifying and maintaining hard and soft tissues that permit a thick, stable peri-implant environment. When tooth loss affects the surrounding gingival structure and/or bone, expedient implant therapy following tooth extraction may be impossible. Several researchers have corroborated that there are significant alterations in the buccolingual dimensions of the ridge despite formation of hard tissue to occupy the marginal gaps around immediate implants in the extraction region, prompting the need for socket management, specifically, bone substitute. In fact, only 2.6% of maxillary incisors and canines have sufficient facial bone plate thickness (≥2 mm) at extraction to support implant placement. Moreover, to prevent complications arising after implant placement, socket management to inhibit resorption of buccal and lingual walls at extraction sites is required. Blood clot formation that occurs after an extraction contains growth factors that can assist internal bone regeneration.

Periodontal and Peri-Implant Inflammatory Diseases

The increasing number of patients receiving dental implant therapy has augmented the incidence of periodontal and peri-

implant inflammatory diseases, the leading cause of which is pathogenic bacterial plaque. Peri-implant mucositis, the colonization of dental plaque causing inflammation of the soft tissues surrounding a dental implant, is a reversible condition with no bone loss. This condition has the same structural and functional properties as gingivitis lesions around periodontal tissues, both representing the host response to a bacterial infection resulting from biofilm formation. In peri-implantitis, there is an apical diffusion of the inflammation, which leads to a gradual loss of osseointegrated supporting bone. Furthermore, the presence of untreated periodontal disease in the oral environment may lead to the establishment of pathogenic microorganisms in peri-implant sites, resulting in the development of peri-implant disease. The prevalence of peri-implantitis was reported to be up to 14.4% and seemed to be linked to the number of years that the fixtures were in use. Moreover, 16% of patients with implant therapy that were not enlisted for standard periodontal maintenance exhibited peri-implantitis by 7 to 9 years following implant placement; this however is likely an underestimation of the incidence of peri-implantitis due to insufficient studies with adequate follow-up periods. It is particularly important to note that with increasing placements, more implants are being placed in
patients with a past history of periodontitis. Consequently, the success rate for implants can be reduced while the risk for developing peri-implant problems will increase. Thus, these susceptible or “at risk” patients will require even greater vigilance in peri-implant maintenance.

**Periodontal and Peri-Implant Maintenance**

Periodontal and peri-implant maintenance are important in attaining continued success of periodontal and dental implant therapy. Their purposes are to:

1) limit the recurrence and progression of periodontal disease in patients who had prior treatment for gingivitis and periodontitis by minimizing bacterial plaque; 2) decrease the occurrence of tooth loss by surveying dentition and any implant replacements; and 3) increase the ability to promptly locate and treat other diseases originating within the oral cavity. It has been demonstrated that tooth loss can be prevented in as many as 85% of patients during a prolonged follow-up period of up to 53 years with routine periodontal maintenance.

Studies have demonstrated that a lack of post-treatment periodontal maintenance after periodontal therapy often eliminates the advantages of therapy, resulting in disease recurrence, additional loss of periodontal tissues, loss of two to three times the number of teeth, and a doubling of the risk for re-treatment requirement.

There are four categories of periodontal/perimplant maintenance depending on the individual needs of patients, as shown in the table below.

<table>
<thead>
<tr>
<th>Periodontal/Peri-Implant Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preventive Maintenance</strong></td>
</tr>
<tr>
<td>• Prevents disease onset in patients who currently have no periodontal nor peri-implant pathology but are at increased risk due to existing systemic disease or poor dexterity that impedes good oral hygiene</td>
</tr>
<tr>
<td><strong>Trial Maintenance</strong></td>
</tr>
<tr>
<td>• Surveys mild periodontal diseases (including minor pocket depths or furcation defects, insufficient gingiva surrounding teeth or implants, gingival structural defects) and evaluates possible disease progression and additional treatment requirement</td>
</tr>
<tr>
<td><strong>Compromise Maintenance</strong></td>
</tr>
<tr>
<td>• Moderates disease progression in patients who would benefit from, but are not suitable candidates for corrective treatment due to various reasons, including health, economics, and poor oral hygiene</td>
</tr>
<tr>
<td><strong>Post-treatment Maintenance</strong></td>
</tr>
<tr>
<td>• Inhibits disease recurrence following successful treatment, such as in patients with localized progressive periodontitis or peri-implantitis who have had effective regenerative surgical therapy; most frequently prescribed form of periodontal maintenance</td>
</tr>
</tbody>
</table>

Adapted from Shumaker, et al., 2009

Studies have demonstrated that a lack of post-treatment periodontal maintenance after periodontal therapy often eliminates the advantages of therapy, resulting in disease recurrence, additional loss of periodontal tissues, loss of two to three times the number of teeth, and a doubling of the risk for re-treatment requirement. Therefore, although periodontal maintenance should be adapted to each patient based on disease status, the percentage of bleeding sites identified at each periodontal maintenance visit, and compliance in maintaining good oral health, an interval of 3 months is usually sufficient for most patients. It is recommended that periodontal maintenance visits last approximately an hour and include meticulous extraoral and intraoral examinations, as well as an assessment of the efficacy of the patient’s oral hygiene. Any indications of lingering disease conditions are best resolved promptly using available methods, including local debridement of the site, adjunctive agents, or surgery to maintain good oral health. In fact, studies have demonstrated that in 88% of cases, persistent disease progression during the periodontal maintenance period responds positively to nonsurgical therapy. Subsequent reevaluations scheduled at 4- to 6-week intervals to confirm successful treatment or to determine the need for additional intervention—which may include referral to a periodontist—are recommended. A methodical approach called the “Cumulative Interceptive Supportive Therapy Protocol,” as summarized in the figure (next page), has been suggested for the early detection and treatment of peri-implant diseases. In addition, consensus from the Sixth European Workshop on Periodontology recommends that a radiograph be routinely taken to establish a baseline to serve as a reference for the assessment of peri-implant disease development at maintenance visits.
**Patient Compliance with Periodontal and Peri-Implant Maintenance**

Ultimately, patients must understand that compliance with periodontal maintenance is critical to the success of therapy, and compliance appears to be better following significant surgical periodontal or dental implant procedures than in general. Furthermore, recent studies have reported that the persistent circulation of inflammatory cytokines and acute-phase proteins aggravated by periodontal inflammation is associated with various systemic diseases, such as cardiovascular disease, chronic obstructive pulmonary disease, and type 2 diabetes mellitus, further emphasizing the importance of these maintenance visits.

**Specific Aftercare for Patients Receiving an Implant-Retained Dental Crown**

Assessing the requirement for surgical and prosthetic care and aftercare for patients treated with an implant-retained dental crown, a recent trial studied 93 patients with a single-tooth gap in the anterior maxillary region that were randomly assigned to one of three local augmentation groups to reconstruct local bone defects. All patients had good oral hygiene and a healthy periodontal situation. The results of the study showed that surgical aftercare was required in only 9% of patients, and consisted of a local gingival plasty to treat a gingival retraction and a flap treatment for peri-implantitis. Prosthetic aftercare was needed more frequently, consisting of periodic routine inspections (100%), supplemental oral hygiene support (63%), and additional prosthetic care (16%).

**Patient Expectations and Satisfaction Concerning Implant Treatment**

Prior to treatment, it is critical that there is full disclosure of the risks—ranging from bone loss, peri-implantitis, and bone fracture—involved in extraction and implant placement in the anterior region by the clinician, and of the esthetic expectations by the patient. After placement, a key factor in assessing the success of dental implant therapy is patient satisfaction. A recent study evaluated patients’ expectations prior to dental implant therapy, and compared them with their satisfaction pertaining to function and esthetics following implant therapy. Fifty patients, predominantly women (64%), requesting dental implant therapy were selected to participate in the study. They were asked to complete a questionnaire about influencing variables (smoking habits, implant placement area, gender, educational level, and age), indicate their expectations prior to the procedure, followed by their ratings of the outcome after treatment. An analysis of the expectations and post-treatment completion ratings concerning function and esthetics by a visual analogue scale concluded that post-treatment completion ratings

---

**Overview of the Cumulative Interceptive Supportive Therapy Protocol for Treatment of Peri-Implant Mucositis and Peri-Implantitis**

<table>
<thead>
<tr>
<th>Peri-Implant Mucositis</th>
<th>PD 3 mm</th>
<th>Presence of Plaque BOP Positive</th>
<th>Protocol A</th>
<th>Mechanical Debridement Polishing Assessment of Oral Hygiene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Peri-Implantitis</td>
<td>PD 4-5 mm</td>
<td>Presence of Plaque BOP Positive</td>
<td>Protocol B</td>
<td>Antiseptic Cleansing Local Antibiotic Therapy</td>
</tr>
<tr>
<td>Frank Peri-Implantitis</td>
<td>PD &gt; 5 mm</td>
<td>BOP Positive Bone Loss &lt; 2 mm</td>
<td>Protocol C</td>
<td>Systemic Antibiotic Therapy Periodontal Surgical Access</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BOP Positive Bone Loss &gt; 2 mm</td>
<td>Protocol D</td>
<td>Chemical Disinfection Osseous Resection Guided Bone Regeneration</td>
</tr>
</tbody>
</table>

Treatment is initiated based on PD and BOP criteria. Starting with protocol A is recommended, and if need be, include protocol B. In the case of more advanced disease, a specialist may be required to implement protocol C, and if need be, protocol D.

PD: Pocket Depth
BOP: Bleeding on Probing

Adapted from Lang, et al., 2004 and Shumaker, et al., 2009
considerably exceeded initial expectations, and 2) neither demonstrated statistically significant associations with gender. Although there was a weak inverse correlation between age and functional expectations, the remaining variables did not notably influence initial expectations or final ratings of the outcome.

In conclusion, single-tooth replacements by implant-retained dental crowns in the anterior maxillary region demonstrate implant survival rates greater than 95%, making them reliable treatments. Furthermore, implant therapy is associated with a beneficial cost/effectiveness ratio. Provided that proper aftercare is devoted to maintaining dental implants, they are proving to be safe and effective therapy for single-tooth replacement.

References

Continued from In Practice p. 5
other health professionals. The association between oral health and diet makes for a particularly apt association between dental professionals and dietitians. Caries can signal poor eating habits, but other serious conditions, including diabetes, eating disorders, and oral premalignant mucosal changes may often present to the oral care provider before any other health professional. Furthermore, all of these conditions present an important role for dietetic intervention. The American Dietetic Association supports a collaborative approach between the two professions to mitigate cancer and other oral health risks through appropriate patient education on healthier eating habits. Here we have further examples of how the health professions can work in a team to provide comprehensive primary care to their patients.
Diet and Oral Cancer: Opportunities for Dentist-Dietitian Collaboration

Up to one third of US annual cancer deaths can be related to diet and exercise habits according to the American Cancer Society. It is estimated that oral and pharyngeal cancers (OPC) claimed 7,800 US lives in 2010, with 36,500 new cases diagnosed. Oral healthcare providers may be among the first health practitioners seen by these new patients. As such, dentists and hygienists are uniquely positioned to provide appropriate counseling and referral to prevent cancer deaths.

Diet May Be Key to Reducing the Risk of Many Cancers

How diet may influence cancer risk is not entirely understood, however mounting evidence points to protective roles that many nutrients and other compounds, particularly those found in plants, may play in preventing DNA damage through antioxidant effects. Other compounds can influence cell cycle progression to induce apoptosis. These “phytonutrients” may act synergistically to prevent cancers, including OPC. Conversely, food additives, e.g., nitrates in processed meats, may metabolize to carcinogens, and it has been shown that diets high in salted or processed meat, animal fat, and dairy products increase the risk of not only oral cancers, but those of the head and neck.

Strong evidence has been presented in systematic reviews and meta-analyses for the protective effect of fruits and vegetables, especially citrus fruit, against oral cancer. A diet high in fruits and vegetables protects against OPC and other cancers; interestingly, there is no compelling body of evidence showing the consumption of dietary supplements, including vitamins, minerals, and other bioactive compounds, to be protective.

Oral Health Care Professionals Can Play an Important Role in Cancer Prevention

Through screening and education, oral health care professionals can help detect cancer early or prevent it. Oral cancer checkups are recommended by the American Cancer Society for patients undergoing periodic dental examinations. This is particularly important for patients with known risk factors, such as tobacco use or excessive alcohol use. The table above provides a guide for practitioners to help in identifying and counseling patients at risk.

An Alliance Between Dentists and Dietitians Only Makes Sense

The first signs of poor nutrition often appear in the mouth. As dental practice evolves to encompass not only oral care but also associated chronic conditions, dental practitioners increasingly find themselves with the opportunity to collaborate with

Continued on p. 4
Periodontal Therapy and Anemia: Is There a Relationship?

Pathophysiological Mechanisms Involved in Anemia of Chronic Disease

Periodontitis, the inflammation and infection of the tissues that surround the teeth, if left untreated can result in loss of teeth. The immune inflammatory response elicited by this condition is characterized by the stimulation of T cells, which release interferon-γ, as well as monocytes or macrophages which release tumor necrosis factor-α, interleukin (IL)-1, IL-6, and IL-10. These cytokines can initiate numerous reactions that disrupt red blood cell formation and iron homeostasis, which have been demonstrated to result in the onset of anemia of chronic disease, an anemia that occurs despite the presence of sufficient quantities of iron and vitamins. It is hypothesized that the main contributor to anemia of chronic disease is hepcidin, since upon stimulation by IL-6 it blocks iron absorption by the duodenum and inhibits iron release from macrophages, two events that occur in this chronic condition. In fact, constitutive overexpression of hepcidin in mice leads to a pronounced iron-deficiency anemia, whereas inflammation in mice that were deficient in hepcidin did not affect iron levels.1

Study of Anemic Status in Patients with Chronic Periodontitis

A recent longitudinal interventional study was conducted among 187 subjects with chronic periodontitis, ranging from 30 to 50 years of age and including both genders. The first part of this study evaluated the anemic status of patients with chronic periodontitis (assessed by probing depths ≥ 5 mm at 30% of sites, clinical attachment levels ≥ 2 mm at 30% of sites, gingival index, and plaque index). Patients underwent a series of red blood cell analyses; 34% had hemoglobin concentrations lower than reference values and were diagnosed with anemia, with females showing a greater predisposition to this condition. Incidentally, this is the first known study to compare both sexes and assess the anemic status of patients. On the basis of the mean corpuscular volume values remaining within the reference ranges, it was suggested that the anemic status of the patients was not a consequence of iron or vitamin deficiency, but of chronic anemia.2 This correlation between patients with chronic periodontitis and chronic anemia is supported by a previous report indicating that chronic periodontitis can result in anemia.3 Furthermore, data analyzed from the Third National Health and Nutrition Examination Survey indicates a reverse relationship—anemic patients may be more susceptible to chronic periodontitis.4

Effect of Non-Surgical Periodontal Therapy on Anemic Status of Patients

Although chronic periodontitis can lead to anemia of chronic disease, especially in women, non-surgical periodontal therapy is effective in improving the anemic status of these patients.

### Percent Improvement of Clinical Hematological Parameters at 6 Months After Non-Surgical Periodontal Therapy

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb% (g/dl)</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>RBC (10^12/l)</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>PCV (%)</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>MCV (fl)</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>MCH (pg)</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>MCHC (%)</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
</tr>
</tbody>
</table>

*p < 0.001  †p < 0.05  ‡p < 0.01

Hb%: Hemoglobin concentration  
RBC: Red blood cells  
PCV: Packed cell volume  
MCV: Mean corpuscular volume  
MCH: Mean corpuscular hemoglobin  
MCHC: MCH concentration

Adapted from Pradeep and Anuj, 20117
The second part of the study followed the 57 patients with chronic periodontitis and chronic anemia after they underwent nonsurgical periodontal therapy (NSPT). There was an improvement in all hematologic clinical parameters for both sexes after NSPT from baseline to 6 months as shown in the figure on the previous page. There was a statistically significant improvement in hemoglobin concentration, with female patients showing a greater improvement than male patients. There was also a statistically significant improvement in red blood cell counts and packed cell volume values in both sexes, whereas there was a statistically significant improvement in the mean corpuscular hemoglobin only in male subjects. These improvements in the hemoglobin concentration and red blood cell counts after NSPT at 6 months support the hypothesis that the anemia was not a consequence of low iron or insufficient vitamin stores. There were no statistical differences in the mean corpuscular volume or the mean corpuscular hemoglobin concentration values. The high values of erythrocyte sedimentation rate before NSPT indicated that chronic periodontitis has an inflammatory factor, and the decrease in periodontal inflammation over 6 months is demonstrated by the improvement in the erythrocyte sedimentation rate in all patients. These findings are supported by an earlier study that demonstrated an improvement in hematological clinical parameters at 6 and 12 months in male patients after undergoing NSPT. This improvement in the anemic status of the patients can be explained by the assumption that as the periodontal inflammation decreased after NSPT, it resulted in the improvement of all hematological parameters. Further studies with a larger sampling size and a control group are warranted to confirm these findings and to elucidate the mechanism relating chronic periodontitis with anemia of chronic disease.

References

Continued from Clinical Practice p. 11

There is no safe therapeutic window for NSAIDs, even for short term use, in patients with prior MI:

- Treatment with NSAIDs, including nonselective NSAIDs and COX-2 inhibitors, is associated with increased and instantaneous cardiovascular risk in patients with MI.
- Although widely used, diclofenac is associated with higher and earlier cardiovascular risk than rofecoxib, which was withdrawn from the market due to its unfavorable cardiovascular risk profile.

Reference

Continued from Healthcare Trends p. 12

of the Task Groups presents the research needs relevant to their own areas. Some of the overarching research issues that emerged were: the need for oral health research on social determinants that impact on behavioral and risk factors for chronic disease; implementation of current best evidence and need for translational research; integration of dental and general health research, including identification and reduction of common risk factors.

Following the publication of the report of the Task Groups, the IADR organized a Workshop in Arlington, VA, USA in order to integrate the work carried out, to refine and identify key priorities for future research, and to outline a five-year research agenda. The IADR will now distribute the reports of the Task Groups and the Workshop to its Scientific Groups and Divisions for their consideration and views. It will also consult with other international oral health organizations and bodies such as WHO and the FDI World Dental Federation. It will then finalize its five-year research agenda. The IADR is to be congratulated on taking the lead on this important initiative on reducing inequalities in oral health.
**Chairside Hypersensitivity Protocols**

It is estimated that more than 40 million people in the US are affected by dentin hypersensitivity. Dental hygienists are often the first to come into contact with patients suffering with dentin hypersensitivity; knowing the right questions to ask and what treatments are available is valuable in helping patients to resolve discomfort and prevent its long-term repercussions. Useful strategies for identifying and treating chairside hypersensitivity have recently been published by Sleeper and Stefanou.1

**Assessing Dentin Hypersensitivity**

A patient’s medical history and assessment of habits, medications, and lifestyle can uncover what underlies dentin hypersensitivity. Recording what triggers the onset of the pain, whether the pain is dull or sharp, and how long the pain lasts, as well as whether the patient is in the process of whitening their teeth, provides information necessary for directing treatment. Pain scales can be used to provide a qualitative (i.e., mild, moderate, or severe) or quantitative (i.e., visual analog scale from 1 to 100, with 100 being the most painful) baseline measure of hypersensitivity to which the effects of treatments can be compared at later visits.2

**Contributing Factors**

Dentin hypersensitivity occurs when any of a number of factors causes loss of tooth enamel and subsequent dentin exposure.3 Contributing factors are acid-containing diets, gingival recession or periodontal diseases, as well as mechanical insult, including abrasion, abfraction, attrition caused by bruxism, and microfractures.3 Aggressive tooth brushing is a common culprit.

**Underlying Mechanisms**

When tooth enamel is compromised, dentin tubules are left unprotected at the tooth’s surface. Stimuli like heat, cold, pressure, or chemicals cause fluid to move within dentinal tubules and displace nerve endings in the pulp, causing nerve membranes to depolarize, resulting in pain.3

**Treatment and Prevention**

Treatments for hypersensitivity either occlude the open dentinal tubules or block the nerve response. The figure below shows treatment steps based on the level of pain, where dentin hypersensitivity is diagnosed by selectively eliminating predisposing factors and incorporating specific treatments if the pain persists or worsens. The modality of treatment is largely contingent upon the severity of the pain.

Contemporary chairside treatments that can prevent and/or treat dentinal hypersensitivity by occluding dentinal tubules include fluoride varnish and calcium phosphate technologies.1

**Fluoride Varnish**, one of the most common hypersensitivity treatments,4 acts by occluding tubules with calcium fluoride placed on the tooth surface so that a barrier to offending stimuli is created.3 Fluoride varnish is applied to a patient’s teeth chairside, with the patient instructed to leave the varnish undisrupted for several hours by avoiding tooth brushing and hot liquids. In recent years, improvements in the color and flavor of fluoride varnishes have increased patient acceptance of this treatment.1

**Dental hygienists, acting as an integral component of a dental healthcare delivery team, can offer a practical approach to assessing, preventing, and treating dentin hypersensitivity chairside.**

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**Treament Steps for Dentin Hypersensitivity**

<table>
<thead>
<tr>
<th>Pain Level</th>
<th>Treatment Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild Pain</td>
<td>Eliminate predisposing factors</td>
</tr>
<tr>
<td></td>
<td>+ Desensitizing toothpaste or mouthwash</td>
</tr>
<tr>
<td>Pain Persists or Moderate Pain</td>
<td>Topical agent</td>
</tr>
<tr>
<td></td>
<td>+ Prevention</td>
</tr>
<tr>
<td></td>
<td>± Desensitizing toothpaste</td>
</tr>
<tr>
<td>Pain Persists or Severe Pain</td>
<td>Adhesion material or surgery</td>
</tr>
<tr>
<td></td>
<td>+ Prevention</td>
</tr>
</tbody>
</table>

Continued on p. 10

Adapted from Sleeper and Stefanou, 20111
NOW THERE’S AN EVERYDAY TOOTHPASTE THAT OFFERS

FASTER & Long-Lasting
Hypersensitivity Relief*

Colgate® Sensitive Pro-Relief™
Toothpaste works better than Sensodyne®¹

- Clinically proven to work faster than Sensodyne¹
- Patient-preferred taste vs Sensodyne to help ensure compliance¹
- Contains fluoride for caries protection and everyday use

Recommend to your patients with dentin hypersensitivity

*Faster vs Sensodyne Extra Whitening Toothpaste. Within 2 weeks. Based on clinical studies. Lasting relief with continued use.

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After reading this issue of the Colgate Oral Care Report and correctly answering the questions in The Forsyth Institute Continuing Education Program, you will:

1. understand the patient risks and benefits to implant procedures and the factors that improve the chances for short- and long-term success;

2. recognize the relationship between diet and oral cancer and the significant role of the oral healthcare practitioner in reducing oral cancer risk;

3. know the relationship between chronic periodontitis and chronic anemia, and the steps oral care practitioners can take to improve these patients’ hematological clinical parameters; and

4. learn about the latest chairside therapeutic modalities available for dentin hypersensitivity, and how the dental healthcare delivery team can provide practical approaches to assessing, preventing, and treating this condition.

References


NSAIDs and Risk of Death and Recurrent MI in Patients with Prior MI

Nonsteroidal anti-inflammatory drugs (NSAIDs) are widely used in the general population, and consequently in the population seeking oral care. A number of recent studies have highlighted the increased cardiovascular risk associated with NSAID use, and in particular among patients with established cardiovascular disease.

Current clinical practice guidelines discourage NSAID use in patients with cardiovascular diseases, such as myocardial infarction (MI) and heart failure. If NSAID treatment is required, clinical practice guidelines advise that the treatment duration be as short as possible. However, a recent nationwide study performed in Denmark\(^1\) is challenging the views that:

- Short term use (i.e., 1 week) of NSAIDs is safe; and
- Nonselective NSAIDs are safer than cyclooxygenase-2 (COX-2) inhibitors with regard to cardiovascular risks.

In their database analysis exploring death and recurrent MI in a population of 83,677 patients with prior MI, Schjerning et al.\(^1\) showed that NSAID treatment was associated with an increased risk of death/recurrent MI at treatment onset, and this increased risk was persistent throughout the course of treatment. This was true not only for the COX-2 inhibitor rofecoxib, which was withdrawn from the market in 2004 due to its unfavorable cardiovascular risk profile, but also for the COX-2 inhibitor celecoxib. Most importantly for the healthcare community, the nonselective NSAID diclofenac, which is available over-the-counter in several countries, was associated with higher cardiovascular risks than rofecoxib in patients with prior MI (see table).

This study emphasizes that even short-term NSAID treatment is associated with increased and immediate cardiovascular risk in patients with prior MI, in particular for diclofenac, but also for rofecoxib, ibuprofen, and naproxen.

<table>
<thead>
<tr>
<th>Risk of Death and Recurrent Myocardial Infarction Associated with NSAID Treatment Among Patients With Myocardial Infarction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nonselective NSAID</strong></td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td><strong>Diclofenac</strong></td>
</tr>
<tr>
<td>0-7 days</td>
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<tr>
<td>7-14 days</td>
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<tr>
<td>14-30 days</td>
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<tr>
<td>30-90 days</td>
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<tr>
<td>&gt; 90 days</td>
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<tr>
<td><strong>Ibuprofen</strong></td>
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<tr>
<td>0-7 days</td>
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<td>7-14 days</td>
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<td>14-30 days</td>
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<td>30-90 days</td>
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<tr>
<td>&gt; 90 days</td>
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<tr>
<td><strong>Naproxen</strong></td>
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<td>0-7 days</td>
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<td>7-14 days</td>
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<td>14-30 days</td>
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<tr>
<td>30-90 days</td>
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<tr>
<td>&gt; 90 days</td>
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<tr>
<td><strong>Cyclooxygenase-2 inhibitors</strong></td>
</tr>
<tr>
<td><strong>Celecoxib</strong></td>
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<tr>
<td>0-7 days</td>
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<tr>
<td>7-14 days</td>
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<tr>
<td>14-30 days</td>
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<tr>
<td>30-90 days</td>
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<tr>
<td>&gt; 90 days</td>
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<tr>
<td><strong>Rofecoxib</strong></td>
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<tr>
<td>0-7 days</td>
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<td>7-14 days</td>
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<tr>
<td>14-30 days</td>
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<tr>
<td>30-90 days</td>
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<tr>
<td>&gt; 90 days</td>
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</tbody>
</table>

Adapted from Schjerning, et al., 2011\(^1\)

Current clinical practice guidelines recommending the use of short duration NSAID treatment for patients with established cardiovascular disease, and who require an NSAID, will need to be revised in light of these results. Awareness among dental professionals as to the current knowledge on cardiovascular safety issues of NSAIDs is important to ensure optimal management of patients with cardiovascular disease seeking oral care.

Continued on p. 7
In May 2009, the International Association for Dental Research (IADR), under the leadership of then President David Williams, developed an initiative entitled Global Oral Health Inequalities: the Research Agenda (GOHIRA), with the overall objective of creating measurable improvements in reducing inequalities in global oral health. This was done against a background where it is recognized by the World Health Organization (WHO) that there are major inequalities in health within and between countries. In 2008, the Commission on Social Determinants of Health, which was set up by WHO, concluded that unfair economic arrangements, poor policies and programs, and bad governance were responsible for most inequalities in general health globally. It is also recognized that major inequalities also exist in the prevalence of oral diseases within and between countries.1

As part of the GOHIRA initiative, the IADR established six Task Groups in the following areas; Dental Caries, Periodontal Disease, Oral Cancer, Oral Infections, Developmental Abnormalities, and Implementation and Delivery. The overall remit to the Task Groups was to look at variations in disease and the reason for this, the failure to implement measures known to be effective, priorities for research, and the development of a five-year research agenda to tackle inequalities.

The Task Groups reported their findings at a symposium at the IADR General Session in Barcelona in 2010. Included in that symposium were key note addresses by Sir Michael Marmot on Social Determinants of Health, and by Dr. Larry Tabak on Global Inequalities: The View from a Research Funder.

The full reports of the Task Groups and the other presentations made at the symposium were subsequently published in 2011 in Advances in Dental Research.2 This publication provides a strong background on the major issues impacting oral health globally. In his introductory article in the publication,2 David Williams summarized some of these issues:

- 90% of people have experienced dental problems due to caries and most caries remain untreated in low to middle income countries;
- Severe periodontitis affects 5 to 20% of most populations and is most prevalent in low income groups;
- Oral cancer is the eighth most common cancer worldwide, and tobacco use, alcohol, and diet are important risk factors;
- Oral infections contribute to the burden of oral disease, including HIV and its associated infections, as well as TB, sexually transmitted diseases, and NOMA;
- Cleft palate is the most significant developmental abnormality, with a global incidence ranging from 1 to 4 per 1000 births.

There is also an excellent overview in the publication of the research issues that need to be addressed in order to reduce the burden of oral diseases and reduce inequalities. In their reports, each

Continued on p. 7
1. What is the leading cause of periodontal and peri-implant inflammatory diseases?
   a) Systemic disorders
   b) Pathogenic bacterial plaque
   c) Tooth loss
   d) All of the above

2. Which of the following statements about patient expectations following dental implant therapy is true?
   a) There is generally excellent patient compliance concerning periodontal maintenance.
   b) There is usually a requirement for a surgical intervention during the periodontal maintenance period.
   c) It has been shown to be extremely effective in preventing tooth loss.
   d) It does not present a beneficial cost/effectiveness ratio.

3. Which of the following statements about patient expectations prior to dental implant therapy is false?
   a) Women have greater expectations than men regarding esthetic aspects of dental implant therapy.
   b) Educational levels of patients influence the initial expectations of dental implant therapies.
   c) Expectations regarding dental implant therapy usually exceed the outcome of the procedure.
   d) All of the above

4. Which of the following statements is true?
   a) Citrus fruit may confer protection against cancer.
   b) Multivitamin/mineral supplements protect against cancer.
   c) Meat is carcinogenic.
   d) All of the above

5. Which of the following statements is false?
   a) Dental professionals may be the first to know of a precancerous condition in a patient’s mouth.
   b) Resources to facilitate patients’ transitions to more positive lifestyles are scant.
   c) Tobacco and alcohol use are important risk factors for the development of oral cancers.
   d) None of the above

6. What role can the dental professional fill in encouraging lifestyle changes among patients?
   a) Be aware of patient risk factors for cancer and other chronic conditions.
   b) Provide credible resources to inform patients’ decisions.
   c) Refer patients to professional dietitians and other health professionals.
   d) All of the above

7. Which of the following is NOT suggested to contribute to the onset of anemia of chronic disease?
   a) Inactivation of T cells
   b) Inflammation associated with periodontal disease
   c) Elevated levels of hepcidin
   d) Disruption of iron formation

8. Which of the following is true about the findings of a study by Pradeep and colleagues assessing patients with chronic periodontitis and anemia of chronic disease?
   a) Non-surgical periodontal therapy is effective in improving the anemic status of these patients.
   b) Chronic periodontitis may have led to the anemia of chronic disease.
   c) Females, rather than males, with periodontal disease are more prone to developing anemia of chronic disease.
   d) All of the above

9. In a study by Pradeep and colleagues, which hematological parameter(s) showed improvement at 6 months after non-surgical periodontal therapy?
   a) Mean corpuscular volume
   b) Hemoglobin concentration, red blood cell count, and packed cell volume
   c) Mean hemoglobin corpuscular concentration
   d) All of the above

10. The use of NSAIDs in patients with prior myocardial infarction is true?
    a) is safe for short courses of treatment.
    b) is safer if nonselective NSAIDs are prescribed rather than cyclooxygenase-2 inhibitors.
    c) is safer if diclofenac is prescribed rather than rofecoxib.
    d) None of the above

11. Current clinical practice guidelines on the use of NSAID treatment in patients with cardiovascular disease such as myocardial infarction (MI) and heart failure are true?
    a) Encourage the use of NSAIDs.
    b) Should be updated to reflect recent study results of Scherning and colleagues.
    c) Recommend the use of short-term NSAID treatment if NSAID treatment is required.
    d) All of the above

12. Dentin hypersensitivity is attributed to
    a) Repolarization of nerve endings in the pulp.
    b) Dentin tubules open at the tooth’s surface.
    c) Remineralization of enamel.
    d) All of the above

13. Assessment for dentin hypersensitivity may include
    a) A patient’s medical history and assessment of habits.
    b) Severity of and triggers for the pain.
    c) Whether the patient is in the process of whitening their teeth.
    d) All of the above

14. Which of the following has not been named as contributing to dentin hypersensitivity?
    a) Acid-containing diets
    b) Aggressive tooth brushing
    c) Chewing gum
    d) Microfractures

15. Fluoride varnish
    a) Acts through calcium fluoride occluding dentin tubules.
    b) Is applied chairside with patients instructed to avoid its disruption for several hours.
    c) Is one of the most common hypersensitivity treatments.
    d) All of the above

Mark only one answer per question by filling in the box.

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