Quintessence International Symposium

TMD & FACIAL PAIN and HEADACHE

Bridging the Gap Between Current Research and Clinical Practice

FEBRUARY 6–7, 2015

JW Marriott Camelback Inn Resort & Spa
Scottsdale, Arizona

Program Co-Chairs: Daniel M. Laskin and Charles S. Greene

www.quintpub.com/istmd

Presented by The Quintessence International Publishing Group
Dear Colleagues,

We are pleased to invite you to attend the Quintessence International Symposium on TMD & Facial Pain and Headache: Bridging the Gap Between Current Research and Clinical Practice. We all know that despite what has been learned from years of both basic and clinical research in the field, many practitioners still have problems treating these patients. Among the numerous reasons for this dilemma is the lack of familiarity with research done in fields outside of dentistry that has direct application to the diagnosis and treatment of patients with various temporomandibular disorders (TMDs) and orofacial pains. It is the intent of this symposium to narrow this knowledge gap and to demonstrate how this information can be applied to improve patient care.

The program will be divided into two parts. The first day will focus on the scientific basis for clinical practice and will include the latest information on such topics as sensory mechanisms of TMD and orofacial pain; biomechanics of the temporomandibular joint (TMJ) function; the pathophysiology of myofascial pain and TMD; predicting treatment responsiveness; and genetic aspects of TMD and orofacial pain. The second day will be devoted to discussion of the clinical management of TMD, orofacial pain, and headache patients, with emphasis on an evidence-based approach and how application of the latest basic and clinical research can lead to more successful treatment.

To accomplish the goals of this symposium, we are fortunate to be able to bring together a unique group of distinguished national and international researchers and clinicians who are recognized experts in their fields. We hope that you will join us for this unusual educational opportunity in the Valley of the Sun.

Daniel M. Laskin, DDS, MS, DSc (Hon)
Program Co-Chair

Charles S. Greene, DDS
Program Co-Chair

PROGRAM OBJECTIVES

Upon completion of this symposium, participants will be able to:

- Better differentiate among the different TMDs and orofacial pain conditions
- Understand the pathophysiology of the various TMDs and orofacial pain conditions
- Describe the recommended treatments for the different TMDs and orofacial pain conditions as well as their indications and contraindications
- Predict treatment responsiveness in TMD and orofacial pain patients
## PROGRAM SCHEDULE

**Program Co-Chairs: Daniel M. Laskin and Charles S. Greene**

### FRIDAY, FEBRUARY 6, 2015

**Scientific Basis of Clinical Practice**

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<td>7:00 AM–8:00 AM</td>
<td>CONTINENTAL BREAKFAST IN EXHIBIT HALL</td>
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<tr>
<td>8:00 AM–8:30 AM</td>
<td>Daniel M. Laskin</td>
<td>Introduction</td>
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<tr>
<td>8:30 AM–9:15 AM</td>
<td>Barry J. Sessle</td>
<td>Sensory Mechanisms of TMD and Orofacial Pain</td>
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<tr>
<td>9:15 AM–10:00 AM</td>
<td>Sandro Palla</td>
<td>Biomechanics and Mechanobiology of the TMJ</td>
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<td>10:00 AM–10:30 AM</td>
<td>BREAK WITH EXHIBITORS</td>
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<td>10:30 AM–11:15 AM</td>
<td>Dorrit W. Nitzan</td>
<td>Lubrication of the TMJ</td>
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<td>11:15 AM–12:00 PM</td>
<td>Rafael Benoliel</td>
<td>Pathophysiology of Masticatory Myofascial Pain</td>
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<td>12:00 PM–12:45 PM</td>
<td>LUNCH BREAK WITH EXHIBITORS—LUNCH PROVIDED</td>
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<td>12:45 PM–1:30 PM</td>
<td>Boudewijn Stegenga</td>
<td>Unifying Concepts of TMJ Osteoarthritis</td>
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<td>1:30 PM–2:15 PM</td>
<td>Gilles Lavigne</td>
<td>Sleep and Orofacial Pain</td>
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<tr>
<td>2:15 PM–3:00 PM</td>
<td>William Maixner</td>
<td>Genetic Determinants of TMD and Orofacial Pain</td>
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<td>3:00 PM–3:30 PM</td>
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<tr>
<td>3:30 PM–4:15 PM</td>
<td>Richard Ohrbach</td>
<td>Predicting Treatment Responsiveness in TMD and Orofacial Pain Patients</td>
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<tr>
<td>4:15 PM–5:00 PM</td>
<td>Daniele Manfredini</td>
<td>Assessing the Use of Diagnostic Technology</td>
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### SATURDAY, FEBRUARY 7, 2015

**Evidence-Based Approach to Patient Management**

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<tr>
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<th>SPEAKER</th>
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<tr>
<td>7:00 AM–8:00 AM</td>
<td>CONTINENTAL BREAKFAST IN EXHIBIT HALL</td>
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<tr>
<td>8:00 AM–8:45 AM</td>
<td>Tore A. Larheim</td>
<td>Advances in Diagnostic Imaging</td>
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<tr>
<td>8:45 AM–9:30 AM</td>
<td>Gary M. Heir</td>
<td>Pharmacologic Management of TMD and Orofacial Pain</td>
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<tr>
<td>9:30 AM–10:15 AM</td>
<td>Daniel Paesani</td>
<td>Bruxism, TMD, and Orofacial Pain</td>
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<tr>
<td>10:15 AM–10:45 AM</td>
<td>BREAK WITH EXHIBITORS</td>
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<tr>
<td>10:45 AM–11:30 AM</td>
<td>Jeffrey P. Okeson</td>
<td>Management of Patients with Masticatory Muscle Pain</td>
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<tr>
<td>11:30 AM–12:15 PM</td>
<td>Louis G. Mercuri</td>
<td>Management of Patients with Degenerative Joint Disease</td>
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<td>12:15 PM–1:00 PM</td>
<td>LUNCH BREAK WITH EXHIBITORS—LUNCH PROVIDED</td>
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<tr>
<td>1:00 PM–1:45 PM</td>
<td>Howard A. Israel</td>
<td>Management of Patients with Internal Derangements</td>
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<td>1:45 PM–2:30 PM</td>
<td>Steven B. Graff-Radford</td>
<td>Headache and TMDs</td>
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<tr>
<td>2:30 PM–3:00 PM</td>
<td>BREAK WITH EXHIBITORS</td>
<td>(Exhibits close at 3:30 PM)</td>
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<tr>
<td>3:00 PM–3:45 PM</td>
<td>Reny de Leeuw</td>
<td>Management of Orofacial Neuropathic Pain</td>
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<td>3:45 PM–4:30 PM</td>
<td>Michael Detamore</td>
<td>Tissue Engineering and the TMJ</td>
</tr>
<tr>
<td>4:30 PM–5:00 PM</td>
<td>SUMMARY AND CONCLUSIONS</td>
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The deadline for registering for the symposium is January 23, 2015. On-site registration will be offered only on the basis of space availability and thus cannot be guaranteed. Early advance registration will be accepted only if room capacity allows. Technical exhibits will be held on Friday and Saturday during the symposium in Salons H–J. All participants are invited to visit the exhibits to observe the latest developments in dental products offered by leading manufacturers.

REGISTRATION
Your registration fee includes admission to all symposium sessions and exhibits, daily breakfast, coffee breaks, lunch, and the symposium Welcome Reception on Friday evening. Take advantage of specially reduced fees by registering in advance.

REGISTRATION FEES
By 12/01/14 On or after 12/02/14
Regular rate US $798 US $898
Student rate* US $398 US $398
Auxiliary/Office staff** US $625 US $725
*Please submit verification of student status along with the registration form.
**Support staff only. Verification required upon request.

HOW TO REGISTER
Complete the enclosed registration form and do one of the following:
• Register online at www.quintpub.com/istmd
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• Fax your completed registration form with your credit card information (Visa, MasterCard, American Express, or Discover accepted) to Quintessence Publishing at 630-736-3633.
On-site registration will be offered only on the basis of space availability and thus cannot be guaranteed. Early advance registration is strongly recommended.
The deadline for registering for the symposium is January 23, 2015.

CANCELLATIONS/REFUNDS
Cancellations made in writing and received by Quintessence before January 23, 2015 will be refunded in full. For cancellations received on or after January 23 but before the start of the meeting, a cancellation fee of US $75 will be charged. No refunds will be made after the symposium begins on February 6, 2015.

REGISTRATION DESK
Your symposium packet will await you at the symposium registration desk located outside Salons C–G. The desk will be open from 12:00 pm–6:00 pm on Thursday, February 5, and from 6:00 am–5:30 pm on Friday and Saturday. Please note that on-site registrations will be accepted only if room capacity allows.

LOST BADGES
Your badge represents your admission ticket to all lectures. If you lose or misplace your badge, you will be charged a replacement fee of US $300; there are no exceptions to this policy. You must wear your badge each time you wish to enter the lecture hall.

TECHNICAL EXHIBITS
Technical exhibits will be held on Friday and Saturday during the symposium in Salons H–J. All participants are invited to visit the exhibits to observe the latest developments in dental products offered by leading manufacturers.

EXHIBIT HOURS
Friday, February 6, 2015 7:00 am–5:30 pm
Saturday, February 7, 2015 7:00 am–3:30 pm

SYMPOSIUM WELCOME RECEPTION
A Welcome Reception will be held on Friday, February 6, from 7:00 pm–10:00 pm in Mummy Mountain 1 and 2. Food and beer/wine will be provided. Take this opportunity to renew friendships and meet colleagues from around the world.

CONDUCT AT SYMPOSIUM
If an attendee engages in unacceptable behavior, Symposium organizers reserve the right to take any action they deem appropriate, including expelling offending persons from the Symposium without further notice or refund.

Photographing or videotaping of any session is explicitly prohibited. Violators will be expelled from the Symposium without a refund.

HOTEL RESERVATIONS
The JW Marriott Camelback Inn Resort & Spa, selected as the official hotel for this symposium, is offering a special rate to symposium participants. Please note that hotel rooms have been blocked and reservations at the special symposium rate will be accepted until the cut-off date of January 15, 2015, or until the room block is sold out, whichever comes first. Therefore, it is recommended that you reserve your room as early as possible.
To make your reservations, please call the hotel reservation desk direct at 480-948-1700, or register online at http://resweb.passkey.com/go/temporomandibular. Make sure to indicate the name of the symposium (Quintessence International Symposium on TMD and Facial Pain) to receive the special meeting rate of US $289 per night (single/double rate). Reservations must be accompanied by a first night room deposit or guaranteed with a major credit card. Cancellations made within 7 days of arrival will forfeit one night’s room and tax. To change your reservation dates, make a cancellation, or for any other conditions applicable to your reservation, please contact the hotel directly.

CONTINUING EDUCATION CREDITS
One hour of continuing education (CE) credit is offered for every hour of program attendance. CE credit awarded for participation in a course may not apply toward licensing renewal in all states. It is the responsibility of each participant to verify the requirements of his or her state licensing board. Meeting attendees are responsible for ensuring that their education credits are current and on file with their respective state board or other licensing/regulatory agency. Attendees of the symposium may receive up to 14.50 hours of CE credit. If you have any questions regarding CE credit, contact Stephanie Andropolis at sandropolis@quintbook.com.
ABSTRACTS

FRIDAY, FEBRUARY 6, 2015
DAY 1: Scientific Basis of Clinical Practice

8:30 AM–9:15 AM
SENSORY MECHANISMS OF TMD AND OROFACIAL PAIN
Barry J. Sessle, DDS, PhD, DSc (Hon), FRSC, FCAHS
Animal models of acute or chronic orofacial pain have revealed a vast array of ion channels, receptors, and chemical mediators involved in the peripheral sensitization of nociceptors following orofacial injury or inflammation, thus pointing to potential biomarkers and targets for the development of new or improved peripherally based approaches to help diagnose or manage orofacial pain. Research has documented the integral role that the brainstem subnucleus caudalis (medullary dorsal horn) and associated brain areas play in processing related to the sensory/discriminative, cognitive, and affective/motivational dimensions of orofacial pain. Also noteworthy has been the discovery of intrinsic brain networks and processes that can modulate orofacial pain transmission, such as “central sensitization” of neurons following tissue injury or inflammation. Genetic factors may also contribute considerably to the variability between patients in orofacial pain expression and in the effectiveness of therapeutic approaches.

9:15 AM–10:00 AM
BIOMECHANICS AND MECHANOBIOLOGY OF THE TMJ
Sandro Palla, DMD
The integrity of the intra-articular disc seems to be crucial for maintenance of joint integrity, as the disc plays a role in both stress distribution and joint lubrication. Thus, it is likely that stresses that weaken the disc can compromise the primary mechanisms that distribute loading and reduce tractional forces within the TMJ, increasing the risk of osteoarthritis. This lecture will discuss the results of a series of in vivo experiments using dynamic stereometry that analyzed the translation of the stress fields in the disc during various joint movements. This lecture will also discuss in vitro experiments showing that plowing forces can compromise cartilage integrity in a force-related manner by causing cell death as well as by altering the chondrocyte metabolism, enhancing the expression of the catabolic enzymes and decreasing that of the anabolic ones, a process that leads to cartilage degeneration and ultimately to osteoarthritis.

10:30 AM–11:15 AM
LUBRICATION OF THE TMJ
Dorrit W. Nitzan, DMD
When “anchored disc phenomenon” was first described and demonstrated by magnetic resonance imaging (MRI) in severely limited mouth opening cases, it was clear that the disc was stuck to the articular eminence and therefore did not slide down the slope of the eminence. It has been assumed that this clinical condition, which is promptly released by lavage, is consequent to damage to the lubrication system. In order to understand the phenomenon, it has become necessary to learn more about the TMJ lubrication that enables the joint that have been involved in a prior episode of (osteo)arthritis. There is growing evidence to support that internal derangements represent alterations in joint anatomy and biomechanics resulting from mal-adaptive changes in the structure and function of tissues making up the joint that have been involved in a prior episode of (osteo)arthritis. Studies have shown that disc repositioning procedures are unsuccessful and that symptoms improve without changes in disc position. The accumulating evidence suggests a rationale for managing TMJ osteoarthritis based on decreasing mechanical stress and joint loads combined with reducing or interrupting the intra-articular inflammatory process, thus allowing the joint tissues to heal and regain function. In this lecture, the major scientific achievements of the past 25 years and their clinical implications will be discussed.

11:15 AM–12:00 PM
PATHOPHYSIOLOGY OF MASTICATORY MYOFASCIAL PAIN
Rafael Benoliel, DDS, LDS
The pathophysiology of persistent orofacial myalgia has been the center of much controversy. We have progressed from a very mechanistic approach to a complex biopsychosocial model. This lecture will review current evidence that supports the hypothesis that the induction of persistent regional myalgia involves the interplay between a peripheral nociceptive source in muscle, a faulty central nervous system component, and decreased coping ability. It is currently accepted that a complex interaction of variable intrinsic (eg, genetics and epigenetics) and extrinsic (eg, trauma and life events) factors act to induce myalgia and dysfunction. These are presented as a potential pathophysiological model.

12:45 PM–1:30 PM
UNIFYING CONCEPTS OF TMJ OSTEOARTHRITIS
Boudewijn Stegenga, DMD, PhD
Osteoarthritis is a pathologic entity of the TMJ in which the condition of the articular cartilage and the synovial apparatus plays a central role. While the importance of excessive mechanical stress on the TMJ cartilage and subchondral bone is currently well established, there is growing evidence to support that internal derangements represent alterations in joint anatomy and biomechanics resulting from mal-adaptive changes in the structure and function of tissues making up the joint that have been involved in a prior episode of (osteo)arthritis. Studies have shown that disc repositioning procedures are unsuccessful and that symptoms improve without changes in disc position. The accumulating evidence suggests a rationale for managing TMJ osteoarthritis based on decreasing mechanical stress and joint loads combined with reducing or interrupting the intra-articular inflammatory process, thus allowing the joint tissues to heal and regain function. In this lecture, the major scientific achievements of the past 25 years and their clinical implications will be discussed.

1:30 PM–2:15 PM
SLEEP AND OROFACIAL PAIN
Gilles Lavigne, DMD, PhD
Sleep is a natural process that can be disrupted by sensory inputs, including pain. Chronic musculoskeletal orofacial pain can disrupt sleep continuity and trigger nonrestorative sleep and fatigue complaints. Sleep disorders such as insomnia, periodic limb movement, respiratory event–related arousals, and apnea have been proposed to contribute to poor sleep quality. However, their precise role in the circle of poor sleep complaint and pain remains debatable. Recent studies have failed to support the role of sleep bruxism motor activity as a direct factor in orofacial pain and morning headache. To better understand sleep and pain management, certain issues need to be clarified: (1) During sleep, do placebo analgesia mechanisms remain active? (2) Protection of sleep continuity appears to be critical. (3) Certain oral appliances and opioid medications may do more harm than good. (4) Genetic predisposition may explain some of the complaints. These are just some of the issues on which more evidence is needed to better manage the deleterious interaction between pain and sleep.
2:15 PM–3:00 PM
GENETIC DETERMINANTS OF TMD AND OROFACIAL PAIN
William Maixner, DDS, PhD

TMD and related pain conditions are composed of aggregates of phenotypes (signs and symptoms) associated with peripheral and central nervous system dynamics, stress responsiveness, and inflammatory states. Complex molecular networks underlie these heterogeneous phenotypes, and these networks are shaped by intrinsic polygenetic factors and environmental events such as physical injury and psychologic stressors. This lecture will discuss emerging concepts and knowledge of the contribution of genetic variants, including recent discoveries that emphasize a genetic contribution to human pain perception and TMD. Findings will be presented from recently completed and ongoing cross-sectional and prospective studies that examine the biopsychosocial and genetic factors contributing to the onset and maintenance of TMD. Emerging bioinformatic technologies will be discussed that are proving useful in unraveling molecular networks that contribute to the clinical phenotypes observed in subpopulations of patients with persistent pain conditions.

3:30 PM–4:15 PM
PREDICTING TREATMENT RESPONSIVENESS IN TMD AND OROFACIAL PAIN PATIENTS
Richard Ohrbach, DDS, MS, PhD

While TMDs can be reliably diagnosed based on the aggregate of symptoms and findings specifically associated with the masticatory system, the severity of the symptoms and findings is not a sufficient marker for the severity of the physical condition. For example, symptom status or severity of the findings does not strongly predict response to a treatment targeted for the physical condition. In contrast, TMD treatments that are targeted to the person (eg, behavioral treatment) often are at least as effective as treatments targeted to the physical condition. Therefore, it seems that treatment responsiveness for TMD patients is determined by a wide range of factors beyond those local or specific to the masticatory system. These factors include the nature of the disease process itself; how we measure treatment responsiveness; levels of treatment and how the levels are tailored to the individual; presence of comorbid conditions; and the role of learning and adaptation within chronicity.

4:15 PM–5:00 PM
ASSESSING THE USE OF DIAGNOSTIC TECHNOLOGY
Daniele Manfredini, DDS, PhD

For an instrument to be useful at the clinical level, it must satisfy the criteria for an effective prescription, including its influence on treatment planning and decision making. The fundamental prerequisite is good diagnostic accuracy. The recent literature has focused on appraising the clinical validity of diagnostic devices aiming to measure surface electromyography (sEMG) of jaw muscles, provide jaw kinesiography recordings, or assess body posture. Using such devices in treatment planning often leads to instrument-planned irreversible changes in dental occlusion. Yet results of most studies suggest that the use of parameters based on sEMG activity, jaw kinesiography, or body posture assessment is limited by the high intra- and interindividual variability of findings and by their inability to discriminate subjects with TMD pain from pain-free individuals. Thus, their use as stand-alone or even ancillary diagnostic devices is not recommended, especially in the light of the potential risk for unnecessary overtreatments on dental occlusion.
10:45 AM–11:30 AM
MANAGEMENT OF PATIENTS WITH MASTICATORY MUSCLE PAIN
Jeffrey P. Okeson, DDS
Muscle pain is the most common source of pain in humans. Everyone has experienced this type of pain, often regularly throughout life. Masticatory muscle pain is the most common type of TMD, far exceeding joint pain. Yet the dental profession has not been able to view muscle pain like other health care providers can. Often dentists believe muscle pain is the consequence of a mechanical issue, such as a malocclusion or a misaligned joint. In order to be effective in managing muscle pain, we need to appreciate the physiology and etiology of muscle pain, which can be very complex. This lecture will offer a clinical model that will highlight six different clinical presentations of masticatory muscle pain. Differentiating each of these conditions will assist in selecting effective treatment strategies.

11:30 AM–12:15 PM
MANAGEMENT OF PATIENTS WITH DEGENERATIVE JOINT DISEASE
Louis G. Mercuri, DDS, MS
The most common joint pathology affecting the TMJ is degenerative joint disease (osteoarthritis or osteoarthrosis). Among individuals with TMJ disorders, 11% had symptoms of TMJ-osteoarthritis (TMJ-OA). TMJ-OA begins in the matrix of the articular surface of the joint, with the subcondylar bone and capsule secondarily involved. The classic types of TMJ-OA are primary osteoarthrosis, produced by intrinsic degeneration of articular cartilage, typically the result of age-related functional loading; and posttraumatic secondary osteoarthrosis. Once the breakdown in the joint starts, TMJ-OA can be crippling, leading to a variety of morphologic and functional deformities. The management goals for TMJ-OA should be: (1) decreasing joint pain, swelling, and reflex masticatory muscle spasm/pain; (2) increasing joint function; (3) preventing further joint damage; and (4) preventing disability and disease-related morbidity. The decision for surgical management of TMJ-OA must be based on evaluation of the patient’s response to noninvasive management; their mandibular function and form; and the effect the condition has on quality of life.

1:00 PM–1:45 PM
MANAGEMENT OF PATIENTS WITH INTERNAL DERANGEMENTS
Howard A. Isreal, DDS
Unfortunately, internal derangement of the TMJ is often misunderstood as a disease entity requiring treatment, and for many clinicians it has become the central focus of TMJ pathologies. However, a significant number of individuals who are perfectly functional with no symptoms have internal derangement of the TMJ, so its clinical significance must be clarified. Internal derangements occur when there is breakdown and failure of articular tissues resulting in altered joint biomechanics. The external factors that lead to tissue failure and internal derangement can ultimately result in pain and limitation of range of motion caused by synovitis, osteoarthrosis, adhesions, and disc degeneration. The presence of internal derangement should be considered a sign that there are biochemical changes in the articular tissues that are leading to tissue failure and biomechanical alterations in joint function. But when and how should these patients be treated, if at all? This lecture will review current research on the cause of internal derangements of the TMJ and the clinical significance of this entity.

1:45 PM–2:30 PM
HEADACHE AND TMD
Steven B. Graff-Radford, DDS
Much focus has been placed on the association between TMD and headache. Headache frequency has been shown to be about twice as high among patients with TMD as among the general population. TMD as a collective term may include myogenous and arthrognous components. Because headache and TMD are so common, they may be related or exist as separate entities. In managing headache, the TMJ and associated orofacial structures should be considered as triggering or perpetuating factors for migraine. It is important for the clinician to consider both peripheral and central processes that may contribute to the headache. The trigeminal nerve is the final conduit of face, neck, and head pain. Due to the central connections, it is possible for referral to occur between divisions. It is therefore very important that cause-and-effect connections between TMD and headache are carefully judged. This lecture will discuss the relationship between the TMJ, muscles, and other orofacial structures and headache.

3:00 PM–3:45 PM
MANAGEMENT OF OROFACIAL NEUROPATHIC PAIN
Reny de Leeuw, DDS, PhD, MPH
At present, pharmacologic management is the first line of treatment for neuropathic pain. Pharmacologic treatment algorithms for orofacial neuropathic pain are largely derived from evidence of efficacy for other neuropathic pain conditions, such as painful diabetic neuropathies, postherpetic pain, and central neuropathic pain. Episodic and continuous neuropathic pains are treated with different medication classes, although there is some overlap. Anticonvulsants such as carbamazepine and oxcarbazepine have proven to be effective for episodic neuropathic pain. Tricyclic antidepressants in low doses, gabapentin, pregabalin, and tramadol have been deemed efficacious for continuous neuropathic pain. Gamma knife surgery and microvascular decompression are frequently employed methods for pharmacologic refractory episodic neuropathic pain, although scientific evidence of efficacy is extremely limited. Motor cortex stimulation has shown promising results in continuous orofacial neuropathic pain. More recently, onabotulinumtoxinA injections have been tried in patients with trigeminal neuralgia as well as in patients with continuous neuropathic pain with promising results.

3:45 PM–4:30 PM
TISSUE ENGINEERING AND THE TMJ
Michael Detamore, PhD
The field of TMJ tissue engineering emerged in the 1990s with the appearance of a few pioneering studies. The following decade saw the field grow with an explosion in the number of published studies, the emergence of leading strategies, and perhaps most importantly, the collaboration of engineers, scientists, and surgeons in developing these leading strategies. The current decade is now poised to make major strides in terms of in vivo studies and perhaps clinical studies as well, with leading approaches in mandibular condyle/ramus and TMJ disc tissue engineering being reviewed. Fueled by the growing sense of community established by the series of TMJ Bioengineering Conferences (four to date) and the strengthening of collaborations between international societies of TMJ surgeons, there is cause for optimism for the future of TMJ tissue engineering.
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By signing the above, I also agree to the conditions regarding the policies, rules, and regulations governing the exhibition as printed in the Advance Program. All symposium attendees are required to sign the Registration Form regardless of payment method.

REGISTRATION FEE INCLUDES:
- Admission to all sessions and exhibits;
- Daily breakfast, coffee breaks, and lunch;
- Food, wine, and beer at the Welcome Reception.

SPEAKERS
R. Benoliel R. de Leeuw M. Detamore S. Graff-Radford G. Heir H. Israel
T. Larheim G. Lavigne W. Maixner D. Manfredini L. Mercuri D. Nitzan
R. Ohrbach J. Okeson D. Paesani S. Palla B. Sessle B. Stegenga