# eseLisbon2013

European Society of Endodontology

## 16th Biennial Congress of the European Society of Endodontology

# PROGRAMME

Lisbon Congress Centre
September 12 -14 2013

# WELCOME LETTER

Dear colleagues

On behalf of the Portuguese Society of Endodontology, and myself, I am very proud and delighted to welcome you to the 16th Biennial Congress of the European Society of Endodontology in Lisbon, in September 2013.
The Scientific Programme will cover science and research, technological and technique updates, clinical matters as well as educational innovations. We will also have multidisciplinary and sessions on controversial topics.

Regarding the social programme, we have prepared a meeting that will not only be scientifically and professionally enriching, but will also promote a strengthening of the bonds that already link us together.

The Portuguese Society of Endodontology gladly welcomes you to Lisbon.

The 16th ESE Congress President

António Ginjeira

## INDEX

# COMMITTEES

## Host Society Committee

**Congress President:**
Prof. António Ginjeira

## Organising Committee:

**Secretary:**
Diogo Guerreiro

**Other members:**
Claudia Martins, Rui Pereira da Costa

## ESE Executive Board

**President:**
Prof. Claus Löst

**Secretary:**
Prof. Paul Dummer

**Treasurer:**
Dr. Hakki Sunay

**Chair of the Education and Scholarship Committee:**
Dr. John Whitworth

**Chair of the Research Committee:**
Leo Tjäderhane

**Congress President Elect:**
Prof. Miguel Roig

**Administrator:**
Ms. Sue Bryant

## Contacts

**EXECUTIVE SECRETARIAT**

AIM GROUP INTERNATIONAL

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# LOCAL INFORMATION

## About Lisbon

Lisbon is a magical city, where the imperial past and an independent present come together to make the city unique, a special place full of infinite possibilities.
The capital of Portugal and the Portuguese province of Estremadura, covers an area of approximately 8,744 hectares. Built on seven hills, Castelo, Graça, Monte, Penha de França, S. Pedro de Alcântara, Santa Catarina and Estrela' Lisbon extends in the shape of an amphitheatre along the northern banks of the majestic Tejo River.
This historic city has uncommon character and charm, where 800 years of a wide range of cultural influences, together with the latest trends and lifestyles, create truly spectacular contrasts.
Probably the most fascinating, passionate and satisfying of all European cities, with blue skies all year round and a pleasant winter, this city offers opportunities for fabulous shopping with designer labels, exciting views of the city and the river and a picturesque setting where old electric trams lead you through narrow alleys. Ancient ways fuse together with the sophistication of the 21st century

## Language

The official language is Portuguese. English is widely spoken.

## Local Time

Mainland Portugal is 1hour behind European Standard Time and the same time as the UK [GMT].

## Currency

As member of the European Monetary System, the Portuguese monetary unit is Euro (€).

## Tipping

Tipping is optional, but normally 10% is customary in taxis, restaurants and bars.

## Exchange

Major credit cards are accepted in most hotels, shops and restaurants. Traveler's cheques and currency can be changed at hotels or at a bank - these are open Monday to Friday from 08:30 to 15:00. Automatic changing and cash dispensing machines linked to international networks are also widely available.

## Post and Telecommunications

Automatic direct dial telephone services are available to and from most countries in the world. Public phones accept either a pre-paid card, or coins. Credit systems such as AT&T are also available. Post offices are open Monday to Friday from 08:30 to 12:00 and 14:00 to 18:00.

## Medical Care

Clinics and hospitals provide round the clock emergency service. The national emergency phone number is 112.

## Electrical Current

European type 2 pin sockets with 220 volts AC at 50 cycles are used. The phase 380 volt current is normally available in meeting and exhibition rooms.

## Shops

Shops are open from 09:00 to 13:00 and 15:00 to 19:00 Monday to Friday, and 09:00 to 13:00 on Saturdays. In major town centers and in most shopping malls, shops stay open during lunch hours, but close later at night, including weekends.

## Main Shopping Areas (Lisbon Centre)

The Pombaline section at downtown, bordered by the magnificent Praça do Comercio, facing the river Tagus, the Rua do Ouro, Rua Augusta and Rua da Prata finishing at Rossio Square, Avenida da Liberdade, and the Chiado leading to Bairro Alto. Some of the main Shopping Centers are Colombo (one of the biggest in Europe), Vasco da Gama, Amoreiras, El Corte Ingles.

## Sales TAX

Sales TAX (VAT) is included in prices quoted. For non E.C. residents, tax free shopping schemes are available in many shops, which give substantial savings to visitors.

## Driving

Vehicles drive on the right side of the road. The use of safety belts is compulsory, and children under 12 must ride in the back seats. Portugal has a large freeway network crossing the whole country from the North to the Algarve in the South, and from the Atlantic Ocean to the border with Spain. Valid driving licenses from EC countries, the USA, Canada and other major countries are acceptable for use in Portugal up to 6 months stay.

## Public Transportation

There is a wide inexpensive network in all towns and cities. In Lisbon, city of the seven hills, you can choose between bus, underground metro, elevators, and electric trams, within the city or to the suburbs.

## Meals

Breakfast is normally served between 07:30 and 10:00, lunch from 12:30 to 15:00 and dinner from 19:30 to 22:00.

## Dining

There is a wide variety of restaurants and cafes in Lisbon ranging from the elegant and sophisticated to the casual and inexpensive. Take-away and fast food are also available from many outlets. Restaurants, bars, some with live shows and discos along the river Tagus, at Rocha Pier and at the Expo 98 site, are very popular, especially at weekends.

## Entertainment

Lisbon has a variety of theatres and venues catering for most tastes. Opera, ballet, plays, concerts, etc, take place on a regular basis all year round. Portuguese Fado and Folklore shows are popular and complements the many discos and other nightspots.

## Recreation

Excellent golf courses, tennis and squash courts, water sports and horse riding tempt the energetic delegate. The more relaxed might choose from the many noteworthy museums and monuments, sunny beaches and interesting cities to explore.

## Religious Services

Portugal is predominantly Catholic, but a wide number of other faiths are also followed. Please inquire at hotel reception desks for times and places of services.

## Climate

The climate in Lisbon is temperate, offering the best of both Atlantic and Mediterranean sea breezes all year round.

# CONGRESS GENERAL INFORMATION

## CONGRESS VENUE
The 16th Biennial Congress of the European Society of Endodontology is held at the Lisbon Congress Centre.

## Language
The Congress language is English. No simultaneous translation will be provided.

## No Smoking
Smoking is strictly forbidden in the Congress Venue.

## Mobile Phones
Delegates must keep their phone in the off or silent position in all the scientific presentation rooms.

## Photography and Video Recording
Delegates must not take photographs or make video recordings of lectures.

## Congress Secretariat Opening Hours

| | | |
|---|---|---|
| Wednesday | 11 September | 8.30 - 18.00 |
| Thursday | 12 September | 7.30 - 18.30 |
| Friday | 13 September | 7.30 - 18.00 |
| Saturday | 14 September | 7.30 - 16.00 |

## Cloakroom
A cloakroom is available near the Congress Secretariat area. Delegates must not leave their personal belongings at the venue after the closing-time.

## Cloakroom Opening Hours

| | | |
|---|---|---|
| Wednesday | 11 September | 8.00 – 19.00 |
| Thursday | 12 September | 8.00 – 19.00 |
| Friday | 13 September | 8.00 – 19.00 |
| Saturday | 14 September | 8.00 – 17.00 |

## Refreshments
Complimentary coffees/refreshments will be available for the participants in the breaks between the sessions. (please check the congress timetable for the coffee breaks times).
A bar/café in the congress venue area is also available throughout the congress.

## Meals
Lunch boxes will be available for all delegates in the Trade Exhibition area. A restaurant is available on site; other restaurants are within walking distance.

## Insurance
The congress organizers cannot accept liability for personal injuries sustained or for loss or damage to property belonging to congress participants, either during or as a result of the congress. Please ensure you have valid personal insurance.

## Preview Room: 1.11
A preview room is available for the Congress speakers in the first floor.
All speakers should visit the Preview Room at least 2 hours prior to their lecture to discuss with the technician how the slides will be managed. Speakers that have early morning presentations should visit the Preview Room the day before up to 18:00 or by 08:00 at the latest the same day.

## Preview Room Opening Hours

| | | |
|---|---|---|
| Wednesday | 11 September | 8.00 – 18.00 |
| Thursday | 12 September | 8.00 – 18.00 |
| Friday | 13 September | 8.00 – 18.00 |
| Saturday | 14 September | 8.00 – 15.00 |

## Speakers Room:1.10

A speakers Room nearby the Preview Room will be available to all invited speakers from September 12th throughout the congress.

## REGISTRATION ENTITLES DELEGATES TO:

- entry to all Scientific Sessions and the Trade Exhibition;
- admission to the Welcome Reception, coffee breaks and lunches;
- certificate of attendance (pdf format on completion of on-line evaluation form);
- congress bag and material

Entrance to the congress, exhibition and social events is via tickets and badges. Badges will be supplied on registration and must be worn at all times.

## REGISTRATIONS FOR ACCOMPANYING PERSONS

Accompanying persons are not able to register for pre-congress courses and are not able to attend the Scientific sessions.

Two special packages are available:

### 1. Only social events

Welcome Reception on Wednesday and ESE Reception on Thursday
100 Euro per person

### 2. Social events, coffee breaks and lunches and access to the exhibition

Welcome Reception on Wednesday and ESE Reception on Thursday plus coffee and lunches at the Congress
220 Euro per person

# SOCIAL PROGRAMME

## Welcome Reception

The Welcome reception will take place on Wednesday evening at 17:30 in the exhibition area of the congress centre. Entrance is subject to registration and display of the congress badge. The reception is free for participants. Accompanying persons can attend if they are registered and pay the appropriate fee.

## ESE Reception

The ESE reception will take place on Thursday evening from 19:00 to 22:00 in Pátio da Galé. The reception is free for participants. Accompanying persons can attend if they are registered and pay the appropriate fee. Please note there will be a limit on the number of alcoholic drinks per person.
Please note: the ESE reception on Thursday evening is available to accompanying persons but not available for non-ESE registered postgraduate students or undergraduate students.

## Gala Dinner

The Gala Dinner will take place on Friday evening at 20:00 in Kais Restaurant. Entrance is subject to registration and submission of a ticket. Participants can request tickets for the Gala Dinner at the Social Programme Desk, subject to availability, at the cost of 100 Euros.

## Children (under 18 years old)

Delegates must be aware that the social events at the ESE congress are likely to be very crowded and will involve the availability of alcoholic drinks. In addition, the Welcome Reception will be held in the Trade Exhibition area where a considerable amount of valuable equipment will be on display. Delegates with children should take account of these circumstances should they wish to bring children to the social events on Wednesday and Thursday.
As a result the ESE has developed the following policy for children:
Children between 12 and 18 years may attend the Welcome Reception on Wednesday, ESE Reception on Thursday and Gala Dinner BUT are required to be registered as accompanying persons and pay the appropriate fee.
Children under the age of 12 years may attend the Welcome Reception on the Wednesday and the ESE Reception on Thursday on the understanding that the venues will be crowded.

## MEETINGS & FUNCTIONS (Invitation only)

**ESE General Assembly**
Wednesday 11 Sep – Hall 4

**Flemish Society of Endodontology Meeting**
Wednesday 11 Sep – Meeting Room 1.08

**ESE Certified Members Lunch**
Thursday 12 Sep – Restaurant Tejo

**ESE Registered Postgraduate Student Members Lunch**
Friday 13 Sep – Restaurant Tejo - Private Room

**Editorial Board meeting of IEJ (International Endodontic Journal)**
Saturday 14 Sep – 16h00/18h00 – Meeting Room 1.07

## PRE-CONGRESS COURSES

**Wednesday 11 Sep - Hall 3** **09.00 – 12.30**

***Pre-congress course (Lecture based):***
**The extracellular matrix of biofilms, why is it so important?**

**09.00 – 09.05**
**Introduction**
Dr Luc van der Sluis

**09.05 – 09.45**
**Biofilm Matrix**
Dr Luis Chavez de Paz

### Abstract
Biofilms are complex polymicrobial communities adhered to surfaces. These microbial communities represent highly competitive environments where microorganisms are encased in a matrix of highly hydrated extracellular polymeric substances (EPS). The matrix is a conglomerate of extracellular material of different types of biopolymers mostly produced by biofilm bacteria themselves. The matrix serves several essential functions for the biofilm life-style. Structurally, the matrix embeds biofilm bacteria and forms the scaffold for the three-dimensional architecture of the biofilm. The matrix is also responsible for the adhesion to surfaces and for cohesion in the biofilm. The matrix also immobilizes biofilm cells and keeps them in close proximity, thus allowing for intense interactions, including cell–cell communication, and the formation of synergistic micro-consortia. Extracellular enzymes and nutrients are retained in the matrix that can be utilized as nutrient and energy sources. The matrix also acts as a recycling center by keeping all of the components of lysed cells available. This includes DNA, which may represent a reservoir of genes for horizontal gene transfer. The matrix serves as the first line of protection for biofilm bacteria against environmental stress such as: desiccation, oxidizing or charged biocides, some antibiotics and metallic actions, ultraviolet radiation and host immune defenses. Ecologically, competition and cooperation in the confined space of the EPS matrix lead to a constant adaptation of population fitness.

### Aims
The aim of this lecture is to review the main functions of the matrix and how it influences in the physiology of biofilm micro-organisms.

### Objectives
The objective is to lay the groundwork for a better understanding of the functions and capabilities of the microbial biofilm matrix in order to design better ways to treat biofilm-related infections.

*I declare that I have NO proprietary, financial, or other personal interest of any nature or kind in any product, service, course, and/or company, or in any firm beneficially associated therewith, that will be discussed or considered during the proposed presentation.*

**09.45 – 10.30**

## Effect of antimicrobial agents used in endodontics on the biofilm matrix

Dr Luc van der Sluis

### Abstract

Apical periodontitis, is an oral disease induced by micro-organisms in the root canal system. Micro-organisms in the oral environment are grouped in a biofilm which can be defined as microbial aggregates that usually accumulate at a solid-liquid interface and are encased in a matrix of highly hydrated extracellular polymeric substances (EPS). Instruments used to prepare the root canal can not touch the complete root canal wall due to the complex anatomy of the root canal system with isthmuses, oval extensions and irregular root canal walls. Therefore, complete mechanical disruption of biofilm by endodontic instruments is not feasible and antimicrobial agents like calcium hydroxide or sodium hypochlorite are frequently used during root canal treatment. To exert their antimicrobial effect, these agents should be able to disrupt the biofilm matrix. This lecture will give an overview about the efficiency in disrupting biofilm matrix of the antimicrobial agents used in endodontics.

### Aims

Aim of this lecture is the presentation of the efficiency of antimicrobial agents used in endodontics in disrupting biofilm matrix.

### Objectives

Objective of this lecture is a better understanding of the anti-biofilm effect of antimicrobial agents used in endodontics .

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**11.00 – 11.45**

## Viscoelasticity and the biofilm matrix

Dr Bram Verhaagen

### Abstract

This lecture will explain and demonstrate the phenomenon of viscoelasticity, which can be observed in many solids and liquids encountered even in daily life. Biofilms also display this behavior, due to their matrix, and it actually helps them to withstand the mechanical attacks to which we expose them during a root canal treatment. Therefore we need to understand this viscoelastic behavior and understand how we can adapt our biofilm removal strategies to it. An overview will be given of typical viscoelastic behavior in biofilms and other materials including ways to measure this behavior. Furthermore, the different failure mechanisms (cohesive, adhesive) of biofilms are reviewed in relation to removal of biofilm from the root canal.

### Aims

Aim of this lecture is to demonstrate the phenomenon of viscoelasticity and to explain why it is relevant for the removal of biofilms.

### Objectives

Objective of this lecture is to get a better understanding of the viscoelastic properties of biofilms and how to characterize them, and to think of ways to outsmart this behavior in order to improve their removal during a root canal treatment.

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**11.45 – 12.30**
## Effect of fluid flow on biofilms using a numerical simulation approach
Prof Markus Böl


### Abstract
This lecture focuses on the interplay between fluid and biofilm during growth. Thus, in this contribution first, a constitutive model to describe the mechanical behaviour of microbial biofilms based on classical approaches in the continuum theory of polymer networks is presented. The basic assumption behind the model is that the network of extracellular polymeric substances can be described as a superposition of worm-like chain networks, each connected by transient junctions of a certain lifetime. The second point of this lecture deals with biofilm growth. As a key idea of the proposed growth phenomenological approach, we effort the theory of finite plasticity applied to the isochoric part of the Kirchhoff stress tensor as well as an additional condition allowing for plastic changes in the new grown material, only. This allows us to describe elastic bodies with a fluid-like growth characteristic. Beside biofilms, prominent examples are tumours where the characteristic macro mechanical growth behaviour can be explained based on cellular arguments. The third issue of this lecture is concerned with the combination of the first two points, namely a biofilm material model and a growth approach, applied in the fluidic environment. Several boundary value problems will demonstrate the capability of the presented approach.

### Aims
The aim of this lecture is the presentation of modern modelling techniques and especially to demonstrate their potential in biofilm modelling.

### Objectives
The bjective of this lecture is a better understanding of biofilm modelling. Especially the combination of biofilm growth in a fluidic environment is of high interest and a big challenge in computational modelling.


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**12.30 Session End**

**Wednesday 11 Sep - Hall 3** **14.00 – 17.15**

***Pre-congress course (Lecture based):***
## Cone Beam Computed Tomography in Endodontics

**14.00 – 14.05**
### Background to the course
Dr Shanon Patel

**14.05 – 14.15**
### Introduction
Dr José Manuel Sacramento

**14.15 – 14.45**
### Overcoming the limitations of radiographs
Dr Paul Lambrechts


### Abstract
Conventional dental radiography shows numerous well known limitations which are partly compensated by digital radiography using CCD sensors or phosphor plates. As a result, the practitioner is dealing with: technical difficulties using intraoral radiography, 2 dimensional projected information, image distortion because of angulations and parallax difficulties, inaccurate length measurements, overlap of root anatomy,

overlap of anatomical structures with dental structures, information obscured by cortical plate density, field of view limitations and diagnostic difficulties, hidden pathology and inaccurate outcome estimation, lack of volumetric, axial and lateral information. The 2 dimensional information obtained by digital radiographs can be supplemented with lateral or coronal angulated incidences which can, trough interpretation, be transformed to a mental 3 dimensional understanding. The radiation sum by multiple intraoral radiographs has to be balanced with the single exposure of a full mouth Cone Beam CT (CBCT). The limitations of intraoral radiology can lead to false positive and false negative interpretation with a negative impact on treatment planning. Cone Beam CT has the potential to give an answer for most of the limitations at the condition that high resolution equipment is used and the practitioner is well trained in indication determination, diagnostics and interpretation. Echo Doppler, Magnetic Resonance Imaging (MRI) and diagnostic fluorescence microscopy can supplement digital radiography and CBCT.

### Aims
Visualize the limitations of radiography using practical clinical situations with a variety of pathology and to show real time the synergistic advantage of CBCT imaging. The practitioner should understand the indications of CBCT to supplement radiographic imaging, but at the same time be aware of artefacts, limitations & radiation hygiene.

### Objectives
Multiple clinical diagnostic and treatment cases will be shown where the dentist is faced with the limitations of intraoral radiography. In those cases the additional benefit of CBCT is illustrated but also the false expectations and the pitfalls in over-interpretation will be highlighted. The CBCT as a powerful and precise radiographic imaging instrument is proven and in a number of cases other modern imaging concepts are proposed as supplements in the diagnostic and differential diagnostic approaches. Follow up cases will be used to create an experience-, and evidence-based lecture.

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**14.45 – 15.15**
## Radiographic signs of periapical pathosis - what is the evidence?
Dr Miguel Roig Cayón

### Abstract
An apical radiolucency has probably been the main sign of apical periodontitis. In this lecture the limitations of traditional intraoral radiography will be commented, and how the incorporation of new radiographical techniques (CBCT) affect the existing consensus on radiographic signs of periapical pathosis will be discussed.

### Aims
To discuss how the use of CBCT can improve detection of periapical lesions of dental origin.

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**15.45 – 16.15**
## Assessing the outcome of root canal treatments
## From PAI score to volumetric data
Dr Hagay Shemesh

### Abstract
Following root canal treatment of teeth with a periapical lesion radiography (PA) is used to assess the lesion changes. These changes determine the treatment"s outcome and prognosis of the tooth. However, due to the

compression of the complex three-dimensional (3D) anatomy of the area being radiographed into a two-dimensional shadowgraph, PA Dr Shanon Patel consistently reveal the true nature and location of apical periodontitis. Several ex vivo and in vivo studies have confirmed the improved diagnostic accuracy of CBCT over conventional PA for diagnosing periapical periodontitis ,However, neither PA nor CBCT can distinguish scar healing from a periapical lesion. This presentation will explain the different methods that were used till now to assess healing of the periapical lesion and determine outcome, and will introduce a few CBCT measurement methods. Outcome studies that used these new CBCT methods will be discussed.

### Aims
To explain the limitations of two dimensional imaging in assesing outcome of root canal treatment

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**16.15 – 16.45**
## Using CBCT for treatment planning complex endodontic problems
Dr Shanon Patel

### Abstract
This presentation will highlight the applications of CBCT in treatment planning in endodontics.

### Aims
To give the delegate an insight into the use of CBCT.

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**16.15 – 16.45**
## Panel discussion
## Interactive session with panel.
Dr José Manuel Sacramento

**17.15 Session End**

**Wednesday 11 Sep - Room 1.15** **09.30 – 12.30**

***Acteon Pre-congress Course (hands-on full day workshop):***
## Conventional and surgical retreatment: decision making and new ultrasonic instruments

**09.00 – 12.30**
## Convention retreatment
## Practical use of new ultrasonic tips in conventional endodontic
Dr Bertrand Khayat

### Abstract
After a lecture on the fundamentals of retreatment and the use of ultrasonic instrument, demonstrations of the technique will be made under the operating microscope. Then each participant will reproduce the demo on a specifically design model. The use of the endo success retreatment kit will be explained in detail.

*This Lecture and speaker is sponsored by Acteon*

**14.00 – 17.30**

## Surgical retreatment
## Practical use of new ultrasonic tips in endodontic surgery

Dr Bertrand Khayat

### Abstract

After a lecture on the fundamentals of resection and ultrasonic preparation, demonstration of the technique will be made under the operating microscope. Then each participant will reproduce the demo on a specifically design surgical model. Emphasis will be placed on the importance of the resection and the specific use of the new Acteon surgical tips. The 3, 6 and 9 mm instruments will be used in sequence to produce a longer preparation.

**Wednesday 11 Sep - Room 1.13** **14.00 – 17.30**

***Micro Mega Pre-Congress course:***

## How to perform root canal shaping in continuous rotation with a single file?
## The One Shape concept

**14.00 - 15-30 GROUP 1**

**16.00 - 17-30 GROUP 2**

### Abstract

### Hands-on Seminar Course with lecture

Prof Fabienne Pérez

The recent concept of single use Ni-Ti file for root canal preparation is particularly attractive because on the one hand it greatly reduces the risk of fracture, and on the second hand it avoids the possibility of cross-contamination.

The One Shape concept offers advantages of major importance: One Shape is used in continuous rotation which does not require having any additional motor and does not change the habits of the practitioner already experienced with continuous rotation.

### Aims

This course will discuss innovations in file design and cross-section of One Shape allowing shaping of most of root canals in various clinical situations encountered by practitioners.

### Objectives

At the end of the course, participants should be able to:

- Understand and master the dynamics of One Shape single file in different clinical situations: straight and curved root canals on extracted teeth.
- Implement the One Shape single file system into clinical practice.
- Understand the objectives of a single use file.

*This Lecture and speaker is sponsored by Micro Mega*

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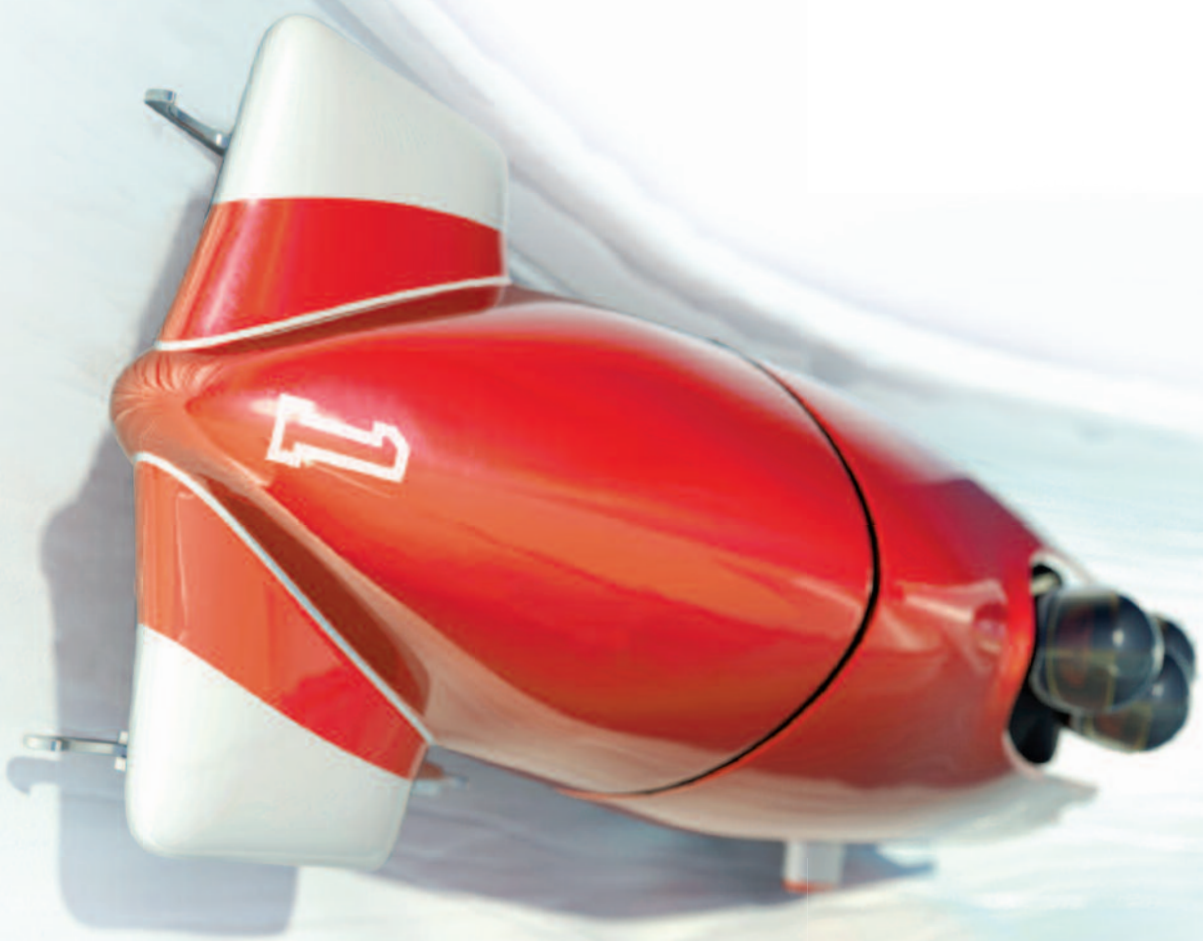

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It is suitable for most root canals, including the highly curved ones, respecting the root canal anatomy better than manual instruments.

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| Time | Hall 1 | Hall 2 | Hall 3 |
|---|---|---|---|
| 09.30 - 10.15 | **Opening Ceremony**<br>António Ginjeira | | |
| 10.15 - 11.00 | **Pulp regeneration: cell-based or cell-free approach?**<br>Prof Gottfried Schmalz - Co-author<br>Dr. Kerstin Galler | **Anomalies**<br>Prof Michael Hülsmann | **Hit & Miss? The Diagnostic Quiz!**<br>Dr Jan Berghmans |
| 11.00 - 11.30 | **Coffee break** | | |
| 11.30 - 13.00 | **Pulp Regeneration - The missing concepts in de novo pulp regeneration**<br>Dr George Huang<br><br>**Sources of dentin pulp regeneration signals and their modulation by the local microenvironment**<br>Prof Imad About | **The use of CBCT to assess the TRUE outcome of endodontic treatment**<br>Dr Shanon Patel<br><br>**Complex and anomalous anatomy: does CBCT really help?**<br>Dr Sashi Nallapati | **Tooth and canal system anatomy Clearing teeth: history, observations, technique and application**<br>Dr Craig Barrington<br><br>**Access cavity preparation**<br>Dr Rui Pereira da Costa |
| 13.00 - 14.00 | **Lunch** | | |
| 14.00 - 15.30 | **Vital pulp therapy and deep caries in adults**<br>Dr Lars Bjørndal<br><br>**Vital Pulp Therapy and Regenerative Endodontics: Novel Models to Investigate Biological Responses**<br>Prof Alastair Sloan | **Resorption**<br>Prof Markus Haapasalo<br><br>**External cervical resorption**<br>Prof Paul Lambrechts | **Sponsor session - SybronEndo 1: Science and Biology, Nickel Titanium alloy in service of Root canal space**<br>Dr Philippe Sleiman<br><br>**Sponsor session - Acteon: Surgical endodontics: the smart choice**<br>Dr Bertrand Khayat |
| 15.30 - 16.00 | **Coffee break** | | |
| 16.00 - 18.15 | **The concept of bonding for root filling materials: the current status**<br>Dr Gustavo De-Deus<br><br>**Successful bonding to root dentin: a duel between knowledge and beliefs**<br>Dr Marcela Carrilho<br><br>**Genesis and healing of radicular cysts**<br>Prof P. N. Ramachandran Nair | **Diagnosing apical periodontitis - Symposium to celebrate the ESE honorary membership of Dag Ørstavik**<br><br>**Introduction**<br>Prof Claus Löst<br><br>**Introductory remarks**<br>Prof Dag Ørstavik<br><br>**Chairside diagnosis and treatment decisions**<br>Prof Paul Wesselink<br><br>**Designing clinical studies on treatment of apical periodontitis**<br>Dr Thomas Kvist<br><br>**Apical periodontal health assessed in population studies**<br>Prof Lise-Lotte Kirkevang | **Sponsor Session - VDW: Single file preparation without glide path with RECIPROC**<br>Dr Ghassan Yared |

| | Hall 4 - The The ESE Wladimir Adlivankine Research Prize Presentations |
|---|---|
| 10.15 - 10.45 | Moderator: Leo Tjäderhane<br>**Musculoskeletal disorders amongst Greek endodontists: a national questionnaire survey**<br>T Zarra |
| 10.45 - 11.15 | **Intracanal temperature and real-time shrinkage of thermoplasticized gutta-percha**<br>S Lottanti |
| 11.15 - 11.45 | **Susceptibility of E. faecalis to different electrochemically-activated solutions in comparison with contemporary irrigants with and without the addition of EndoActivator.**<br>M B Akbulut |
| 11.45 | **Deliberation to decide winner of the Wladimir Adlivankine Prize.** |

## TIMETABLE - FRIDAY, SEPTEMBER 13TH

| Time | Hall 1 | Hall 2 | Hall 3 |
|---|---|---|---|
| 09.30 - 11.00 | **Clinical outcomes in primary root canal treatment**<br>Prof Lise-Lotte Kirkevang<br><br>**The life and times of a successful endodontic pathogen**<br>Dr David Figdor | **Dentine bond strength: durability of hybrid layer**<br>Prof Leo Tjäderhane<br><br>**Electronic Apex locators: anatomical considerations and clinical relevancy**<br>Dr Ashraf ElAyouti | **Current concepts in root canal cleaning and shaping, irrigation and disinfection**<br>Dr Jorge Vera<br><br>**Irrigation**<br>**How to irrigate effectively and Safely?**<br>Prof Markus Haapasalo |
| 11.00 - 11.30 | **Coffee break** | | |
| 11.30 - 13.00 | **That root-filled tooth has a periapical radiolucency– what next?**<br>Prof Paul Abbott<br><br>**Gaining coronal and radicular access for non-surgical root canal re-treatment**<br>Prof Bun San Chong | **Results and conclusions from the report of the Swedish Council on Health Technology Assessment: Methods of Diagnosis and Treatment in Endodontics: A Systematic Review**<br>Dr Thomas Kvist<br><br>**Panel discussion**<br>Participants: Lars Björndal, Markus Haapasalo, Lise-Lotte Kirkevang, Thomas Kvist, Shanon Patel, Paul Wesselink- Gary Hartwell (AAE)<br><br>**Commitments of the ESE**<br>Claus Löst (ESE President) | **Single-file systems**<br>**Is it possible to shape root canals with only one instrument?**<br>Prof Edgar Schäfer<br><br>**Shaping and complex root canal anatomy**<br>Dr Frank Paqué |
| 13.00 - 14.00 | **Lunch** | | |
| 14.00 - 15.30 | **Irrigation in retreatment**<br>Prof Matthias Zehnder<br><br>**Restoring teeth following root canal re-treatment**<br>Prof Francesco Mannocci | **Persistent dentoalveolar pain (Atypical odontalgia): the patient's perspective. Characteristics and impact of PDAP**<br>Dr Justin Durham<br>**Local analgesia**<br>Dr John Meechan | **Sponsor session - SybronEndo 2: Safety and Efficacy Considerations in Endodontic Irrigation**<br>Dr Gary Glassman<br><br>**Sponsor session - DENTSPLY MAILLEFER 1:**<br>Dr Wilhelm–Joseph Pertot |
| 15.30 - 16.00 | **Coffee break** | | |
| 16.00 - 18.15 | **Monitoring and follow-up of teeth after root canal re-treatment**<br>Dr Chankhrit Sathorn<br><br>**Clinical outcomes of root canal retreatment**<br>Dr Yuan-Ling Paula Ng | **Endodontic surgery symposium**<br>Chair: Professor Bill Saunders<br><br>**General issues on endodontic surgery**<br>Prof Syngcuk Kim<br><br>**Soft tissue management in endodontic surgery**<br>Dr Christine Peters<br><br>**Outcome of endodontic surgery: the past and the present. Outcome of endodontic surgery**<br>Dr Igor Tsesis<br><br>**Discussion** | **Sponsor session - DENTSPLY MAILLEFER 2: Endodontic Canal Preparation: ProGlider/ProTaper Next**<br>Dr Clifford J. Ruddle |



| Time | Hall 1 | Hall 2 | Hall 3 |
|---|---|---|---|
| 09.30 - 11.00 | **Microbiology of endodontic infections. Exploring the nature of the primary infection and its interaction with the host.**<br>Prof Kishor Gulabivala<br><br>**Microbiology of Endodontic Infections: Recent innovations**<br>Prof Jose Siqueira Jr | **Maintenance of pulp vitality. The deep carious dilemma: interaction between caries progression and vital pulp therapy in non-exposed teeth**<br>Dr Lars Bjørndal<br><br>**Treatment decision making on primary endodontic cases using CBCT technology**<br>Dr Gilberto Debelian | **Clinical use for novel calcium-silicate bioactive materials**<br>Prof Carlo Prati<br>Co-author: Maria Giovanna Gandolfi<br><br>**3D obturation of root canals: the challenge of oval canals**<br>Prof Zvi Metzger |
| 11.00 - 11.30 | **Coffee break** | | |
| 11.30 - 13.00 | **Porblem solving of iatrogenic damages created during root canal treatment**<br>Dr Fabio Gorni<br><br>**Differential diagnosis of vertical root fractures in endodontically treated teeth**<br>Prof Aviad Tamse | **Post-treatment disease and retreatment Management options for teeth associated with post-treatment disease**<br>Dr Arnaldo Castellucci<br><br>**Surgical endodontics**<br>Prof Syngcuk Kim | **Retreatment: where is the limit?**<br>Dr Pedro Cruz<br><br>**Post-endo restoration: managing the gap**<br>Dr Marco Martignoni |
| 13.00 - 14.00 | **Lunch** | | |
| 14.00 - 15.30 | **The role of the endodontist in preserving alveolar bone in young patients**<br>Prof Cecilia Bourguignon<br><br>**Dental trauma: What do we know, what do we need to know**<br>Dr Asgeir Sigurdsson | **Education symposium**<br>led by John Whitworth and Michael Hülsmann with talks from Vytaute Peciuliene and Jale Tanalp<br><br>**Introductory remarks - Developing our support of European Endodontic teachers**<br>Dr John Whitworth<br><br>**The triumphs and challenges of undergraduate endodontic teaching 1**<br>Dr Vytaute Peciuliene<br><br>**The triumphs and challenges of undergraduate endodontic teaching 2**<br>Dr Jale Tanalp<br><br>**Discussion - defining our key challenges, and developing support for endodontic educators in Europe.**<br>Prof Michael Hülsmann | **Sponsor session - SybronEndo 3: TF ADAPTIVE - a novel approach to canal instrumentation**<br>Prof Gianluca Gambarini<br><br>**Sponsor session - VDW: New Trends in Root Canal Preparation.**<br><br>**Part 1**<br>Nicola Grande<br><br>**Part 2**<br>Dr Gianluca Plotino |
| 15.30 - 16.00 | **Coffee break & Congress closure** | | |

# THURSDAY, SEPTEMBER 12TH
# HALL 1

**09.30 – 10.15**
## OPENING CEREMONY
Antonio Ginjeira

**10.15 – 11.00**
## Pulp regeneration: cell-based or cell-free approach?
Prof Gottfried Schmalz - Co-author Dr. Kerstin Galler

### Abstract
Although success rates of conventional endodontic treatment (and implant placement) are impressive, the basic idea and the ideal of ancient and modern medicine of a restitutio ad integrum; i.e. the recovery to the status ante is not achieved with this approach. Dental pulp regeneration has now become possible by applying the principles of tissue engineering, using dental pulp-derived stem cells, suitable natural or synthetic matrices and a set of signaling molecules. However, dental pulp regeneration still faces challenges such as bacteria control and inflammation. Concerning stem cells and signaling molecules, two approaches seem feasible: (1) mixing stem cells and recombinant growth factors with the scaffold, which then is applied into the root canal; or (2) application of the scaffold and then use/attract resident stem cells and growth factors. Extracorporeal stem cell culture and expansion is afflicted with problems like genome stability and cost. For recombinant growth factors, the concentrations as well as possible adverse effects have to be considered. A cell-free approach relies on cell migration into the scaffold and on the activation of existing growth factor e.g. from dentin. It could be shown that EDTA is able to release e.g. TGFb1, or VEGF, whereas NaOCl is ineffective in this respect. Growth factors are also exposed on an EDTA-pretreated dentin surface. Released growth factors from dentin are able to stimulate pulp cell migration (cell homing). Further animal experiments must show whether this approach can lead to the generation of pulp-like tissues.

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**11.30 – 12.15**
## Pulp Regeneration. The missing concepts in de novo pulp regeneration.
Dr George Huang

### Abstract
There are two types of approach to regenerate tissues – cell-based and cell-free. The former is to introduce exogenous cells into the host to regenerate tissues, and the latter is to use materials other than cells in an attempt to regenerate tissues. There has been a significant advancement in stem cell-based pulp and dentin regeneration research in the past few years. In contrast, cell-free approach has not produced convincing evidence on pulp regeneration. There are several crucial concepts that have not been well discussed, noted or understood in the field of pulp/dentin regeneration: i) critical size defect of dentin and pulp; ii) nature of non-odontoblastic stem cell transdifferentiation into odontoblastic lineages; iii) the quality of regenerated pulp/dentin; and iv) hurdles of cell-based pulp regeneration for clinical applications. Without discussing and understanding these missing concepts and their definitions, it is difficult to predict the extent of cell free-based pulp regeneration that would occur and anticipate how we could implement cell-based pulp regeneration clinically in the future. By reasoning, cell free-based therapy is unlikely to regenerate an

organ/tissue after total loss. Similarly, after a total loss of pulp it is unlikely to regenerate without using exogenously introduced cells. Cell homing approach may provide some but limited amount of tissue regeneration. Although stem cell-based pulp/dentin regeneration has shown great promise, clinical trials are difficult to launch at present. This lecture will address several issues that challenge and hinder the clinical applications of pulp/dentin regeneration which needed to overcome before stem cell or cell free based de novo pulp/dentin regeneration can take place in the clinic.

### Aims
To discuss several critical concepts that have not been addressed sufficiently clarified in the field of de novo pulp regeneration.

### Objectives
In this lecture I will outline, describe and discuss a number of critical concepts that are crucial for the understanding of pulp regeneration process, the design for the pulp regeneration research, the quality of the regenerated pulp, the expectation of the outcome of pulp regeneration, and the challenges we face to achieve successful pulp regeneration in clinic endodontics.

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**12.15 – 13.00**

## Sources of dentin pulp regeneration signals and their modulation by the local microenvironment

Prof Imad About

### Abstract
Understanding dentinogenesis and pulp regeneration during physiological and pathological conditions represents a real challenge in the provision of a suitable treatment that ideally leads to the induction of the pulp regenerative potential. In this presentation we will focus on the early steps of dentin pulp regeneration that appear critical after pulp capping procedures. Different models will be described where the interactions between different cell types in vitro illustrate their role in maintaining pulpal homeostasis. After traumatic injuries, the cells modify the local pulpal microenvironment by secreting growth factors that orchestrate and induce the processes required for dentin/pulp regeneration. Carious decays and applying dental materials onto the injured pulp/dentin also modify this local microenvironment and affect the pulp regeneration potential. The signals involved in pulp regeneration are not only secreted by pulp cells. They can be released from the dentin or from the plasma after the complement activation. The added value of developing an entire human tooth culture model for understanding these early steps will be discussed together with its interest in evaluating newly developed pulp capping materials through the example of BiodentineTM. The growth factors sustained release simulating the local microenvironment will be also discussed.

### Aims
To highlight the interactions taking place between the dentin and underlying pulp and between different cell types within the pulp and their consequences to the pulp dentin regeneration.

### Objectives
To show how soluble factors orchestrate all the processes required for pulp dentin regeneration and how pulp capping materials modulate the secretion of these soluble factors and affect directly the pulp regeneration potential.

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## 14.00 – 14.45
## Vital pulp therapy and deep caries in adults
Lars Bjørndal

### Abstract
Today the biological perception of vital pulp therapy associated with deep caries takes into account the treatment and evaluation of (i) the unexposed pulp with the maintenance of a dentine barrier toward the pulp; and (ii) the exposed pulp. Traditionally, the indication for the treatment of deep caries without irreversible pulpitis has been the same, but the excavation procedures aiming to avoid pulp exposure has been chosen or more pulp invasive treatments such as pulp capping or pulpotomy. Consequently, it is well-known that there is a treatment variation amongst general practitioners for a patient having a deep caries lesion, which is not optimal. Should we choose partial or complete caries excavation or should we select pulp capping or pulpectomy in adults? Before such a question can be answered properly, it is relevant to consider present and future clinical trials trying to collect outcome data for deep lesions using various treatment modalities. It is equally important to address the need for high quality trials, and to specify the actual depth of the carious lesion, and to gain more knowledge about inflammation in the pulp. Taken together, insight for these variables might clarify the correct treatment of choice. Recent clinical trials dealing with the treatment of deep caries lesion will be discussed, that includes both pulp invasive as well as non-invasive concepts, trying to solve the task of getting the best clinical outcome for the adult patient.

### Aims
To provide the status of vital pulp therapy and deep caries in adults.

### Objectives
Using recent clinical outcome studies focus on:
1. study design
2. depth of caries lesion
3. the clinical dilemma of estimating pulp inflammation

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## 14.45 – 15.30
## Vital Pulp Therapy and Regenerative Endodontics: Novel Models to Investigate Biological Responses
Prof Alastair Sloan

### Abstract
To develop novel treatment modalities for vital pulp therapy and regenerative endodontics, it is essential that morphological, functional and easily manipulated model systems are employed to facilitate the understanding of pulpal infection and subsequent tissue repair responses. Understanding how opportunistic pathogens colonise the pulp and direct the disease process can be improved by using appropriate 3D model systems which allows for observation of bacterial growth patterns and host tissue responses. From a regeneration viewpoint, it is widely accepted that progenitor/stem cells reside within the post-natal dental pulp and studies suggest several niches of mesenchymal progenitor cells may be present. These progenitor cells are essential for dentine regeneration following injury. Understanding the nature of these progenitor cell populations, their ability to function in highly compromised environments and determination of their potentialities in terms of specificity of regenerative response may help direct new clinical treatments including development of biologically based new generations of clinical materials. This lecture will explore the development of 3D models to investigate pulpal infection and tissue repair and also new thoughts on the functional biology of the dental pulp stem cells and how they may be harnessed to enhance tissue repair clinically.

## Aims
To discuss critical concepts in developing appropriate model systems for pulpal infection and tissue regeneration and new thoughts on dental pulp stem cell function.

## Objectives
To describe and discuss the development and utilisation of 3D organotypic culture systems to model pulpal infection;
To describe and discuss the use of 3D systems to investigate dental pulp stem cell behaviour and new thoughts on dental pulp stem cell function.

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**16.00 – 16.45**
## The concept of bonding for root filling materials: the current status
Dr Gustavo De-Deus

## Abstract
This talk will address the current status of the so-called bonding root-filling materials. The overall goal of this talk will be to provide a framework for understanding the advantages and limitations of current available technology to fill the root canal space. In fact, this presentation seeks to be thought-provoking where we are now and where we are going regarding to the root-filling materials. For that, the history and current status of the root filling materials will be reviewed as well as their important elements and main challenges. The directions in which the root canal filling may evolve to improve the outcome of the treatment will be addressed including the potential role of nanomaterial research for root canal filling in the near future. Preliminary research results with a novel bioactive gutta-percha will be shown and so, bringing up the discussion of this new perspective: filling the root canal space without a conventional sealer using self-adapt material and a simplified handling procedure.

## Aims
The main aim of this talk is to provide a framework for understanding the advantages and limitations of current available technology to fill the root canal space.

## Objectives
Define the key concepts for supporting the root canal filling procedure; Describe the history and current status of the root filling materials; Recognize critical elements of the canal filling procedure and its main challenges; Identify potential avenues for future developments in relation to root canal filling materials, and highlight how they might impact in the clinical outcome.

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**16.45 – 17.30**
## Successful bonding to root dentin: a duel between knowledge and beliefs
Dr Marcela Carrilho

## Abstract
Dentin comprises the largest dental structural available for bonding whenever adhesive restorative procedures are to be performed on the exposed crown of teeth. In Endodontics, adhesive procedures will always be performed on dentin. Because of its inherent morphological and physiological characteristics, reliable and durable bonding

of adhesive materials to root dentin remains a challenging accomplishment that is subjected to multi-factorial interferences. Adhesive technology has evolved significantly over the past decade, resulting in improved predictability of resin-dentin bonds. This presentation will focus on the present knowledge regarding resin-dentin bond from the perspective of the dentin substrate. Specific attention will be given to describing how morphology and physiology of dentin affect bonding mechanisms, how chemical treatments of dentin can affect its properties and bonding, and finally how bonding to root canal dentin is currently viewed and understood.

## Aims

Dentin is a dynamic substrate and its morphology and physiology affect the ability of adhesive systems to produce durable bonds to its prepared surfaces. This lecture aims to review the present knowledge of dentin as a bonding substrate and demystify beliefs regarding the reliability/unreliability of bonding procedures to root dentin.

## Objectives

A comprehensive and critical review of the literature data will be performed mostly focusing on how dentin reacts to existing bonding strategies, how physiologically and pathologically induced structural and morphological changes affect bonding, and how surface pre-treatments modify receptiveness of dentin

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**17.30 – 18.15**

# Genesis and healing of radicular cysts

P. N. Ramachandran Nair


## Abstract

Radicular cysts are inflammatory cysts developing as a direct sequel to apical periodontitis. The pathogenesis of radicular cysts was unknown for many decades. Recently a prospective, hypothesis-driven, experimental investigation (Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2008;106: 294-303) resulted in successful induction of inflammatory cysts in a murine model. Radicular cysts, most likely, develop by the initiation of an acute inflammatory focus (abscess) within the lesion as a result of secondary microbial invasion into the inflamed tissue from intraradicular biofilm. The abscess gets enclosed and delimited by a proliferating epithelium (supports the 'abscess theory"). The question as to whether radicular cysts heal after root canal treatment has been controversial. This is because of the difficulty to diagnose cysts from other forms of periapical lesions. Histological serial sectioning of the lesions in toto is the only reliable diagnostic method of radicular cysts. This, however, can be applied only after removal of the periapical lesion, thus it is a post hoc diagnosis. Therefore, it is not possible to know which histological type of apical lesion is healing after a successful root canal treatment. This lecture will address the issues relating to the healing apical cysts after endodontic treatment.


## Aims

To describe the genesis of radicular cysts and to discuss the issues relating to the healing of cysts after endodontic treatment.

## Objectives

Radicular cysts are inflammatory jaw cysts
Diagnosis of radicular cysts
How do radicular cysts develop?
Why is the incidence radicular cysts among apical periodontitis so low (>20%)
Or why every apical lesion does not develop into a cyst?
Can endodontic treatment heal cysts?

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# THURSDAY, SEPTEMBER 12TH
# HALL 2

**10.15 – 11.00**

## Anomalies

Prof Michael Hülsmann

### Abstract

Dental anomalies are not limited to the dental hard tissues but can also involve the dental pulp. When irreversible pulp disease or apical periodontitis are present treatment may present major challenges that depend on the severity of the anomaly. Based on the literature and on case presentations the aetiology and nature of a number of dental anomalies with endodontic implications will be presented. The lecture shall have a focus on dental invaginations, fusion and gemination ("double tooth") and taurodontism

### Aims

To present the aetiology and nature of several dental anomalies with endodontic implications and to discuss contemporary treatment options .

### Objectives

To provide an understanding of the development and nature of several common dental anomalies
To allow clinicians to develop an appropriate treatment plan based on the severity and nature of the anomaly.

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**11.30 – 12.15**

## The use of CBCT to assess the TRUE outcome of endodontic treatment

Dr Shanon Patel

### Abstract

Periapical radiography is a somewhat crude tool to assess the presence or absence of periapical periodontitis, but until now it has been the only objective way of assessing the outcome of endodontic treatment. There is no doubt that CBCT is a more reliable and accurate tool for assessing periapical periodontitis. The aim of this presentation is to assess the potential impact CBCT will have on the success rates of endodontic treatment, and also to give a glimpse of how the outcome of endodontic treatment may be evaluated in the future.

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**12.15 – 13.00**

## Complex and anomalous anatomy: does CBCT really help?

Dr Sashi Nallapati

### Abstract

Variation in root canal anatomy makes practicing endodontics challenging yet exciting. Treating complex and anomalous anatomy requires sound knowledge of the nature of the anomaly, and the skill set to effectively

treat it. With the advent of cone beam computed tomography, visualization of root canals in 3-D has become a reality. How useful is this technology in helping a clinician identify and treat complex root canal anatomy is a question that needs to be addressed before we can invest in such technology in our clinical practice. With the help of clinical cases this presentation sheds light on the role of CBCT in the diagnosis and treatment of anomalous and complex anatomy.

### Aims
Aim of this presentation is to present Clinical features of complex and anomalous anatomy. The role of CBCT in diagnosing this complex anatomy : Both advantages and shortcomings. Clinical techniques to address complex anatomy.

### Objectives
With the help of complex clinical scenarios, 2D digital images and CBCT scans this presentation will highlight the advantages and shortcomings of CBCT technology in the diagnosis and treatment of complex and anomalous anatomy.

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**14.00 – 14.45**
## Resorption
Dr Markus Haapasalo

### Abstract
Diagnosis and treatment of tooth resorptions is one important area which helps to define endodontics as a specialty. The presentation includes an update of internal inflammatory root resorption, but mainly discusses the clinical aspects of external cervical resorption. Some 'classical' forms of internal and cervical resorptions are easy to diagnose, but in practice their differentiation is often a challenge, in particular if CBCT is not available. Several examples of complex diagnostic situations will be presented. The main part of the presentation focuses on treatment decision and treatment approaches in cervical resorption: when to treat, internal or external approach, choice of materials, factors affecting the prognosis. Due to synchronization between the presenters, unnecessary overlap with the next lecture by Dr. Lambrechts is minimal.

### Aims
The presentation aims to help the clinician to become confident in differential diagnosis of internal and cervical resorption, and in decision making regarding choice of treatment approach and selection of materials for the treatment of external cervical resorption.

*I declare I have a past or present financial interest/arrangement, consulting position, or affiliation with the corporate organization(s) whose product(s) I will discuss in my presentation.*

**14.45 – 15.30**
## External cervical resorption
Dr Paul Lambrechts

### Abstract
External cervical resorption (ECR) is an extremely complex periodontal and endodontic pathology. Diagnosis and differential diagnosis with internal resorption or root caries is confusing and the periapical radiographs have several detection limitations. Since the introduction of high resolution Cone Beam CT (CBCT) the prevalence seems to increase but this is due to improved detection power. Also the etiological multifactorial triggers are becoming more evident. Most common causes are: non-vital walking bleach technique, collateral damage induced by orthodontic treatment, cementum damage induced by extraction of neighbouring teeth,

cementum abfraction caused by parafunction like bruxing or nail biting, cementum lesions related to eruption collision, chronic irritation caused by cracks or invagination grooves, periodontal pathology and surgery, trauma and even viral infections. ECR-teeth often keep their vitality for a long time even in the progressed stages of the Heithersay classification. Treatment options are variable depending on the resorption stage and the understanding of the pathology by the practitioner and his ability to approach the lesion in a minimal invasive microscopic way. The pathology outcome and the treatment success are related to the ability to circumscribe the lesion and seal the defect. The morphological changes during ECR are numerous at the cementum/enamel/dentin/pulp/bone boundaries and the radiographic visualisation is complex. The Heithersay classification needs further improvement in graphical detail because resorption and granulation tissue invasion is only one part of the story. Substitution by osteodentin and reparative processes are as important as well. Also the portal(s) of entry and portal(s) of exit for ECR need to be specified.

### Aims

Unravel the morphological alterations and to increase the understanding of the intriguing biological processes that lead to hard tissue resorption, granulation tissue invasion and formation of osteodentin substitute material. The diagnostic power of CBCT is used to link the image acquisition to the morphological and histological changes.

### Objectives

Several research tools can help to unravel ECR pathology and to bring their information together in a 3D understanding of ECR dynamics. The synergistic use of clinical surgical microscopy, digital radiography, Cone Beam CT, Micro-CT, Nano-CT, scanning electron microscopy, hard tissue & soft tissue histology and immunohistochemistry helps to visualize the numerous morphological and histological changes in ECR lesions. The resorption of cementum, enamel and dentin occurs in a dynamic way. Bacterial penetration in dentin tubules and tooth tissue interfaces is becoming evident and can be considered as a maintaining factor in ECR. The pericanalar root resorption resistant sheet (PRRS), visible as a radiopaque line, is not only composed of a predentin layer, but is thicker than estimated. It includes primary dentin, reactionary dentin and reparative osteodentin. The formation of intracanalar and intrapulpal reaction calcifications indicate a chronic pulp irritation and is co-responsible for the cloudy appearance. The formation of vascularised osteodentin as a substitute for the resorbed enamel, cementum, dentin and PRRS tissue is extremely complex and only histology linked to Nano-CT clarifies the real nature of the dynamic ECR process. The bone turnover of the osteodentin can be proven and is a regular process in hard tissue biology.

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**16.00 – 18.15**

## *Diagnosing apical periodontitis*
## Symposium to celebrate the ESE honorary membership of Dag Ørstavik

**16.00 – 16.05**
### Introduction
Prof Claus Löst

**16.05 – 16.15**
### Introductory remarks
Prof Dag Ørstavik

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**16.15 – 16.45**

## Chairside diagnosis and treatment decisions

Dr Paul Wesselink

### Abstract

In the clinic often teeth are endodontically diseased with accompanying periapical inflammation. In order to decide to treat this so called apical periodontitis, that may be present either pre- or post-treatment, criteria are needed to make the diagnosis of apical periodontitis and to decide whether to treat the observed apical pathologic lesions independent of the diagnostic method used.

### Aims

The aim of this presentation is to discuss the criteria for the diagnosis of apical periodontitis taking into account the eventual use of more sensitive methods to detect disease like CBCT, than have been used in the past.

### Objectives

The objective is to come to a conclusion as to whether we desire and are able with current treatment methods to treat this disease completely or that outcome criteria have to be formulated to adapt to the sensitivity of new diagnostic tools allowing us to decide when to consider the treatment a valuable contribution to the patients well being.

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**16.45 – 17.15**

## Designing clinical studies on treatment of apical periodontitis

Dr Thomas Kvist

### Abstract

Careful analysis of the scientific basis for the methods that we apply when treating teeth with apical periodontitis has demonstrated extensive limitations. In this part the following issues will be briefly addressed;
1. What are the main shortcomings in clinical studies of treatment on apical periodontitis published until now?
2. What are the important clinical effects of treatment of apical periodontitis?
3. Can clinical effects be substituted by biologic or radiographic outcomes?
4. Can a standard model for measuring effects of treatment of apical periodontitis be established?

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**17.15 – 17.45**

## Apical periodontal health assessed in population studies

Prof Lise-Lotte Kirkevang

### Abstract

The overall aim in endodontology is to prevent or cure apical periodontitis (AP). To assess if we, as a profession, achieve this goal, we need to have a realistic estimate of the spread of AP in the population. Traditionally, epidemiology is perceived as the study of health and disease in a population. Cross-sectional studies have been performed for estimation of the prevalence of AP in different populations during the last

40 years. It is equally important to assess changes in disease pattern. Such information can only be retrieved by pertinent observations gathered over time, either of individuals or of comparable cohorts. Epidemiological methods also include analytic approaches, such as identification and quantification of risk factors associated with disease and development of prediction models. In endodontology the analytic approach has been used to study factors associated with presence, incidence and persistence of AP. This knowledge is relevant for the clinician when assessing probability of disease and/or treatment success for a given patient. In the past there may be aspects of epidemiology that have not have received enough attention in endodontic research. In the lecture a number of questions relevant for endodontic research will be used as a starting point for a discussion of how different data sets and study designs may answer these specific research questions. The discussion will identify issues that need to be resolved for relevant information to be retrieved from observational studies when assessing the prevalence of apical periodontitis in larger populations.

### Aims
To discuss and define essential issues related to the assessment and monitoring of AP in larger populations.

### Objectives
Endodontic research questions will be discussed: how different data sets and study designs can or cannot answer specific research questions. During the lecture essential issues for assessment and monitoring prevalence of AP in larger populations will be identified.

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# THURSDAY, SEPTEMBER 12TH
# HALL 3

**The presentations in this Hall are of interest to all delegates but will be of particular interest to practicing clinicians with an interest in root canal treatment as they will provide an update on the key elements of treatment.**

**10.15 – 11.00**
### Hit & Miss?
Dr Jan Berghmans

### Abstract
Diagnostics are not always perceived as being as exciting or glamorous as therapeutics. While procedure or treatment codes have long and universally been used in dentistry for keeping patient records and for billing purposes, as far as diagnostic aids are concerned most dental insurance plans only value dental radiographies at best. Which probably accounts for the profuse shooting of radiographies of which a well documented amount doesn't meet the technical standards and/or doesn't add any value to the diagnostic process.
Bearing in mind that healthcare efficiency is the ratio of the output to the inputs of the system, technicalism/technologization has brought in another threat to our diagnostic efficiency. We are nowadays being bombarded with Cone Beam CT's in situations where endo-ice, perio-probe and tooth slooth could easily have solved the diagnostic enigma at a lower health and financial cost. In a diagnosis centered environment the systematic integration of elementary diagnostic steps will contribute to make fancy and expensive hi tech therapeutic interventions down the road obsolete.
The tissue responses mostly taking place in a hidden body compartment, the disease picture need to be made 'visible' by indirect methods and tests. The diagnostic quiz can sometimes be challenging but is most of the time a fascinating and rewarding game for those who know the rules.

## Aims
This lecture aims at providing attendees with knowledge about the diagnosis of pulpal and periapical disease.

## Objectives
Based on a series of emblematic clinical cases the lecture will expand on
- the different diagnostic tools and their clinical relevance/accuracy
- diagnostic strategy and the importance of methodological screening for clinical signs and symptoms
- the differential diagnosis between pathology from periodontal and endodontic origin
- how to determine whether a tooth is still savable
- the diagnosis of cracks and fractures in teeth

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**11.30 – 12.15**
## Tooth and canal system anatomy
## Clearing teeth: history, observations, technique and application
Dr Craig Barrington

## Abstract
The objective of endodontic therapy is well understood but failures still occur. Cleaning, shaping and obturation of the pulp canal system and inevitable retention of the tooth for the patient in a disease free state are the clinical goals. The human pulp canal anatomy is still not well understood. Clearing and routine diaphonization of extracted human teeth can now be done efficiently and cost effectively by the practicing clinician on a daily basis to observe the internal anatomy of human teeth. Following a simple protocol, every clinician has the potential to further understand the everyday challenges faced when approaching endodontic therapy in our patients. A clinically failing endodontically treated tooth was extracted and cleared allowing the practitioner to connect a patient"s clinical symptoms to missed/untreated canal anatomy. In conclusion, we still have much to understand and improve upon in our current philosophy of endodontic therapy with relation to current treatment protocols and our understanding of the human dental pulpal anatomic system.

## Aims
To demonstrate an available technique that allows clinicians to observe first hand the ubiquitous and complex nature of the human dental pulp canal anatomy and to also demonstrate how routine and regular observation of this anatomy may help us improve or change our clinical techniques regarding root canal therapy.

## Objectives
- discuss clearing and diaphonization of tissue -what is it -history
- discuss techniques -past techniques -current techniques
- discuss a clinical case demonstrating the usefulness of post operative clearing of a clinically failed root canal treatment.

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**12.15 – 13.00**
## Endodontic Access – Principals, Trends and Perils
Dr Rui Pereira da Costa

## Abstract
The endodontic access cavity represents one of the most important, delicate and riskier stages of the endodontic treatment. It impacts all of the continuing procedures, making them either much easier or packed with difficulties and dangers, including file breakage or tooth perforation.

In the last few years, a new trend of minimally invasive endodontic cavities as arise – the so called "Ninja Accesses". New instruments have also been developed, supposedly to help the clinician in this sensitive task. Could this be considered a breakthrough on the way clinicians should manage this key phase of the endodontic treatment?
Prevention of mishaps is mandatory in endodontic access, but it is also crucial for the clinician to know exactly what can go wrong and what to do to correct it.

## Aims

Supported by clinical cases, the lecture will allow the discussion of various aspects of the endodontic access.

## Objectives

At the end of the lecture, participants should be able to identify
- endodontic access goals
- principles and fundamentals
- eventual accidents or mishaps, its prevention and possible resolutions
- new tendencies in the approach of endodontic access and their implications on the overall objectives

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**14.00 – 14.45**

## Sponsor session: SybronEndo 1

## Science and Biology, Nickel Titanium alloy in service of Root canal space

Dr Philippe Sleiman

## Abstract

Ni Ti is a very interesting alloy; we are still discovering several of its properties by either modifying the crystalline structure in order to improve the flexibility and the torsional properties, or a different rotational system in order to get the best clinical results. The question is that after so many years with experience with this alloy are there anything left to discover and why?
Biology and anatomy are the constants and stable structures that we need to adapt our files and techniques in order to respect nature, especially in the last 3mm of the root canal system considered as the main key of success in endodontics.
During this presentation we will discuss some of the key features of Ni-Ti alloy, and it"s optimal clinical applications with a selection of clinical cases in advance endodontics in combination with chemical preparation of the root canal system, showing great results proving that nature and human body has great healing power once all aggressions are cleared.

*This Lecture and speaker is sponsored by SybronEndo*

**14.45 – 15.30**

## Sponsor session: Acteon

## Surgical endodontics: the smart choice

Dr Bertrand Khayat

### Abstract

Considerable advancements have been made in the recent years in endodontic surgery. New ultrasonic tips have been developed. These long tips have radically changed our approach and enable us to perform procedures that are similar to conventional endodontics. Many teeth that are replaced by implant could be preserved with this technique. The presentation will evaluate the current literature on the outcome of endodontic surgery compared to conventional retreatment and will focus on the use of the new ultrasonic instruments.

### Aims

At the end of the presentation, participants should be able to: evaluate the potential and the outcome of endodontic surgery; understand the use of the new ultrasonic instrument; describe the concept of total surgical retreatment.

*This Lecture and speaker is sponsored by Acteon*

**16.00 - 17.30**

## Sponsor session: VDW

## Single file preparation without glide path with RECIPROC

Prof Ghassan Yared

### Abstract

Single file preparation with only one instrument used in reciprocation was described in 2008. RECIPROC, the first system specifically designed for this type of preparation without glide path, was introduced to the dental profession in 2010. Other single file preparation systems were then later developed. They include instruments used in reciprocation or continuous rotation after creating a glide path.

### Objectives

The objectives of this presentation are: 1) To describe the available systems for single file preparation 2) To discuss the rational and advantages of the concept of single file preparation in reciprocation without a glide path 3) To discuss the efficiency of the concept of single file preparation in reciprocation without a glide path 4) To review the literature pertaining to single file preparation.

*This Lecture and speaker is sponsored by VDW*

# THURSDAY, SEPTEMBER 12TH
# HALL 4

**10.15 – 11.45**

***The ESE Wladimir Adlivankine Research Prize presentation***
**Moderator: Leo Tjäderhane, Chair ESE Research Committee**

**10.15 – 10.45**
**Musculoskeletal disorders amongst Greek endodontists: a national questionnaire survey**
T Zarra

**10.45 – 11.15**
**Intracanal temperature and real-time shrinkage of thermoplasticized gutta-percha**
S Lottanti

**11.15 – 11.45**
**Susceptibility of E. faecalis to different electrochemically-activated solutions in comparison with contemporary irrigants with and without the addition of EndoActivator.**
M B Akbulut

**11.45**
**Deliberation to decide winner of the Wladimir Adlivankine Prize.**
Winner will be announced at the Thursday evening reception

# FRIDAY, SEPTEMBER 13TH
# HALL 1

**09.30 – 10.15**

## Clinical outcomes in primary root canal treatment

Prof Lise-Lotte Kirkevang

### Abstract

Endodontology deals with the causes, diagnosis, prevention, and treatment of diseases of the dental pulp and their sequelae, and the predominant treatment performed in endodontology is root canal treatment. Primary root canal treatment is performed to treat either: pulpitis, where a vital, but irreversibly inflamed pulp is removed, to maintain periapical health and prevent periapical disease; or apical periodontitis, where the pulp is non-vital, the root canal infected and where disinfection is needed to cure already existing periapical disease. If a tooth previously received root canal treatment without success, root canal retreatment may be performed. If all fails, the tooth may have to be extracted. It is important to gain information on how the disease responses to the treatment. Several studies have investigated this. The majority of these are intervention studies where investigators treat the subjects and either just describe the treatment outcome or compare the outcomes of two different treatments to identify the better one. Another type of study is the observational study. Here investigators observe the subjects and measure the outcomes without any intervention except the recording of possible risk factors associated with the outcome. Several reviews have been performed synthesizing information from previously performed studies. Some questions that have appeared are: How often is the treatment successful? What is success in relation to root canal treatment, and how is it measured? Is it possible to identify parameters that increase or decrease the success rate? Are some individuals or teeth more difficult to treat with success? Is it possible to predict outcome with a reasonable certainty? This lecture will go through studies that may provide information on these questions, both when performed in controlled settings but also in general dental practice. Furthermore, factors related to success and failure of primary root canal treatment will be assessed and discussed.

### Aims

To provide a platform for the discussion of root canal retreatment based on evaluation of the outcome of primary root canal treatment performed in clinical and observational studies.

### Objectives

Review of different studies that provide information the outcome of primary root canal treatment and discussion of different aspects related to the outcome.

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**10.15 – 11.00**

## The life and times of a successful endodontic pathogen

Dr David Figdor

### Abstract

Over the last 2 decades, a focus on individual and pooled failed treatment cases has led to an improved understanding of the aetiology of failed endodontic treatment. The prime reason for post-treatment disease is infection in the apical part of the root canal system by species that have endured or evaded antimicrobial treatment, survive in the filled root canal and are capable of inflaming the periapical tissue.
Species with an ability to adapt to the specialised, nutrient-depleted environment of the root filled canal are

favoured for survival and contribution to persistent root canal infection. Elimination of the microbial flora, or a dramatic ecological shift by reduction and disruption of the microbial community are the pivotal factors for a favourable host tissue response.

## Aims

This lecture will describe the microbial ecology of persistent infection associated with the root-filled canal.

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**11.30 – 12.15**

## That root-filled tooth has a periapical radiolucency – what next?

Prof Paul Abbott

## Abstract

Periapical radiolucencies associated with root-filled teeth may occur in different circumstances which implies different diagnoses and management. There are three typical circumstances. The first is when a tumour, cyst or other lesion mimics a lesion of endodontic origin – these need referral for appropriate medical and surgical management. The second scenario is a -persistent radiolucency" when the root canal treatment was completed recently. The cause is usually an infected root canal system due to resistant organisms, inadequate root canal treatment or inadequate restoration - hence root canal re-treatment is the first choice for management. The third scenario occurs when the radiolucency develops many years after the root canal treatment, especially where reviews showed periapical healing. These -late" radiolucencies indicate a -new disease" and they should not be considered as -failure" of treatment. The new disease should be considered the same as other periapical diseases and is most likely a result of an infected root canal system. Hence, it should be managed in the same way as an infected tooth without a root filling - the only difference is that root filling material must be removed from the canals. That is, the concept and approach to treatment is the same but the mechanical aspects vary slightly.

All cases must be reviewed to determine whether the periapical tissues heal. If they heal, then monitoring is all that is required to watch for further -new disease" as a result of restoration breakdown, the presence of cracks or caries. However, if periapical healing is not evident, then surgery may be required as non-healing suggests an extra-radicular infection, a periapical true cyst or a foreign body reaction. Practitioners should also be aware of the possibility that a persistent radiolucency may be a periapical scar in which case no treatment is required apart from regular observation.

## Aims

The aims of this presentation are to discuss the different scenarios where periapical radiolucencies may be associated with root-filled teeth, how these teeth should be assessed and managed, the various healing responses and any subsequent management required with the view to having better and more predictable treatment outcomes.

## Objectives

At the end of this presentation, participants should be able to:

1. Understand why and when periapical radiolucencies may be associated with root-filled teeth.
2. Understand the concept of persistent and new radiolucencies, and what disease processes each represents.
3. Assess root-filled teeth with periapical radiolucencies and formulate management plans for these teeth.
4. Understand the need for follow-up of all treatment in order to assess healing.
5. Understand the various healing responses that may occur following treatment.
6. Manage cases where healing does not occur following root canal re-treatment.
7. Obtain better and more predictable treatment outcomes for their patients.

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**12.15 – 13.00**

## Gaining coronal and radicular access for non-surgical root canal re-treatment

Prof Bun San Chong

### Abstract

Access to the root canal system is required for non-surgical root canal re-treatment. Gaining coronal access may involve the disassembly or the removal of the existing restoration including any underlying material, post or core.
Following which, radicular access, involving the removal of root filling material, is needed to allow the root canal system to be negotiated so that the deficiencies of the original treatment may be rectified.
Many different materials and techniques have been advocated for restoring teeth and for filling root canals. Hence, this lecture will cover the management of commonly encountered clinical scenarios during non-surgical root canal re-treatment and the clinical procedures necessary for gaining coronal and radicular access.

### Aims

The aim is to provide an overview of the clinical procedures and techniques to gain coronal and radicular access for non-surgical root canal re-treatment.

### Objectives

Describe the clinical procedures and techniques that may be employed during non-surgical root canal re-treatment for:
- disassembly or removal of different coronal restorations including any underlying material, post or cores;
- removal of different root filling materials, especially the most commonly used and widely accepted gutta-percha

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**14.00 – 14.45**

## Irrigation in retreatment

Matthias Zehnder

### Abstract

In this lecture, the differences between primary root canal treatments and retreatments are explored in view of optimal disinfection of the root canal system. A critical look at the literature raises doubt whether the microbiota found in retreatment cases per se is more resistant to antiseptics than the counterpart found in primary infections. In reality, primary, refractory, and persisting endodontic infections all are biofilm-related; their microbial composition is dictated by local ecologic factors rather than treatment history. Furthermore, the resistance of primary and persisting infections to antimicrobials is most likely similar. The true difficulty in disinfecting retreatment cases is to reach the infected areas. Iatrogenic alterations in the canal anatomy and the presence of root filling materials hamper the diffusion of disinfectants to these target areas. Consequently, it should first be attempted to clean the canal systems from foreign materials and obtain a canal shape that can be properly disinfected. Ways to achieve this goal are discussed. Subsequently, the disinfection scheme can be similar to that in primary root canal infections. However, time is a crucial factor in retreatments, and thus, a two-visit approach is preferable in more complex cases.

### Aims

The aim of this study is to critically assess paradigms related to disinfection in retreatment cases.

### Objectives

At the end of this lecture, participants should be able to assess sources of bias in studies on root canal infection and disinfection. They should be able to appreciate a sound and simple disinfection protocol based

on what is known rather than on what is speculated upon. In addition, they should be able to discuss expected treatment outcomes with their patients.

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**14.45 – 15.30**

## Restoring teeth following root canal re-treatment

Dr Francesco Mannocci

### Abstract

The restoration of the endodontically re-treated tooth is one of the most complex procedures in restorative dentistry; the biological and clinical factors that can determine the success of such restorations include residual tooth structure, technical difficulties of endodontic retreatments, occlusal problems, aesthetics, periodontal support, the difficulty in bonding to root canal dentine and the interferences of the pre-existing root canal filling and restorative materials with the bonding procedures, the choice of the material to be used for the construction of an onlay or a crown. As it often happens with complex systems, the attempt to produce evidence that incorporates (or excludes) all variables is deemed to fail. There is a paucity of evidence in relation to the influence of specific restorative procedures on the outcome of root canal re-treatment. There have been many recent advances in the methods available for restoring root-filled teeth that can equally be applied to re-treatment cases. Most of these advances are related to adhesive techniques, composite resin materials, non-metallic posts, and indirect ceramic materials. These new techniques and materials have enhanced the options available when restoring root-filled teeth. However, the preservation of sound tooth structure is clearly the most significant factor influencing the survival of teeth following root canal re-treatment. Although contemporary adhesive techniques will facilitate the preservation of valuable dentin in the re-treated tooth, the degree of remaining sound tooth structure will ultimately be dictated by the extent of the existing restoration, carious and non-carious tooth tissue loss, and iatrogenic tooth tissue loss caused during the previous endodontic and restorative procedures.

### Aims

This presentation will address the aspects of the restorations of endodontically retreated teeth in relation to the most recent studies on the survival of endodontically treated teeth, especially those questioning the relevance of the ferrule effect.

### Objectives

A simple yet effective ”heuristic” method to predict the survival of endodontically re-treated teeth in relation with the restorative technique used will be proposed.

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**16.00 – 16.45**

## Monitoring and follow-up of teeth after root canal re-treatment

Dr Chankhrit Sathorn

### Abstract

A monitoring protocol will be presented based on current best available evidence. A gap in the knowledge base regarding healing dynamics following endodontic retreatment is evident, and the impact of this deficit on monitoring protocols will be discussed. Lessons learned from Medicine regarding outcome measurement will be identified and applied to Endodontics. The generally recommended one and four-year outcome

assessment cut-off points and their shortcomings will be critically analysed. Alternative views will be presented using parallel examples drawn from medical epidemiology.

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**16.45 – 17.30**

## Clinical outcomes of root canal retreatment

Dr Yuan-Ling Paula Ng

### Abstract

This lecture will present a systematic review of the studies on clinical outcomes of root canal retreatment, highlighting the methodology and the findings. This presentation will begin with a discussion of the various means and approaches available to assess root canal retreatment outcome. The presentation will then proceed to discuss the strategy for analysing the effect of clinical factors on outcome based on available data. As most of the data happen to be observational and heterogeneous, they were analysed from three perspectives: (1) subjective synthesis of individual study findings; (2) comparisons of weighted averages of pooled data and (3) the weighted pooled odds ratios, both estimated using meta-analyses. These three sources of evidence were used to triangulate a consensus view for the effect of each clinical factor. The findings help to identify and prioritise the key clinical and biological questions for further research, and for informing the refinement of clinical guidelines.

### Aims

To critically and systematically evaluate the evidence for the clinical outcomes of and prognostics factors for non-surgical root canal retreatments.

### Objectives

1) Appreciate the various means and approaches available to assess the outcome of non-surgical root canal retreatment. 2) Able to develop a strategy for prediction of the prognosis following root canal retreatment. 3) Able to critically appraise the evidence for root canal retreatment protocols.

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# FRIDAY, SEPTEMBER 13TH
# HALL 2

**09.30 – 10.15**

## Dentine bond strength: durability of hybrid layer

Leo Tjäderhane

### Abstract

Matrix metalloproteinases (MMPs) and cysteine cathepsins are two groups of enzymes that together can degrade all extracellular matrix proteins, including collagens. During the last 15 years, the knowledge of the presence and the role of MMPs and cysteine cathepsins in dentine-pulp complex has rapidly increased. MMPs are expressed by human odontoblasts and pulp tissue, and many of them are present also in mineralized dentin. More importantly, MMPs and cysteine cathepsins are considered important in in many pathological conditions that occur in teeth, including dentinal caries, pulp and periapical inflammation. Most interest has been directed

towards the role of MMPs and cysteine cathepsins in the durability of resin-dentin bond strength in composite restorations. There is convincing and increasing evidence that dentinal enzymes can destroy the integrity of the composite filling adhesive bond within months or few years. This causes significant loss of dentin bond strength, with potentially increasing risk of marginal leakage, secondary caries and/or loss of filling. Since the quality of coronal restoration in endodontically treated teeth is important to avoid the microbial recontamination of root canal system, defective bonding may also increase the risk of endodontic failures.

## Aims

The lecture aims to provide the basic knowledge of the dentine-pulp complex proteolytic enzymes, and how their destructive effect on long-term bond strength can handled in a clinical setting.

## Objectives

The lecture will briefly introduce dentin-pulp complex MMPs and cysteine cathepsins, but will mainly concentrate to the proposed role of these enzymes in the degradation of the resin-dentine bond. The lecture will also cover different research approaches and recent advances aiming to improve the durability of dentine bonding.

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**10.15 – 11.00**

## Electronic Apex locators: anatomical considerations and clinical relevancy layer

Dr Ashraf ElAyouti

## Abstract

Outcome studies have repeatedly shown a correlation between endodontic success and the apical extent of root canal treatment. The apical constriction and foramen are the recommended endpoints of apical preparation and filling. However, they are highly variable and difficult to detect (clinically and radiographically). Now, modern apex locators are able to accurately determine these two anatomical landmarks. This led to the evolvement of two scientific consensuses concerning the endpoint of endodontic treatment. One recommends the foramen in order to debride the canal in its whole length and the other recommends the constriction to preserve the apical anatomy. But, is there a difference between these two consensuses? And how distant and distinct both foramen and constriction are. As early as the beginning of the last century, histological studies have shown that the apical constriction was rarely present and that its location and form were highly variable. However, most anatomical studies did not analyse serial cross-sections and the distance foramen to constriction was seldom published. MCT serial cross-sectional analysis can be used to map the apical anatomy and to determine the size, form and location of constriction and foramen, which will help to answer many confusing questions. The accuracy of apex locators depends on many clinical factors, which can be influenced by clinicians. Understanding the principle of apex-locators function as well as getting familiar with the clinical situations that influence its function will help clinicians to reach the utmost accuracy and to deal with difficult measuring situations.

## Aims

Demonstrate the anatomic relation between apical foramen and constriction. Aid clinicians to reach the utmost accuracy when using apex locators by understanding the principle of its function. The impact of accurate working length on the outcome of treatment will be presented.

## Objectives

MCT reconstructed images and the related visual analysis will be used to provide a vivid explanation of the topography of the apical anatomy and to show the relation between apical constriction and foramen. Clinical situations that hamper accurate electronic measurements will be presented and the ways to avoid such difficulties will be discussed. A review of the literature will present the links between succes of endodontic treatment and the apical extent of shaping and filling.

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11.30 – 13.00

***Symposium: Research in endodontology - the challenges and solutions***
**Chair: Gunnar Bergenholtz**

**11.30 – 12.00**
## Results and conclusions from the report of the Swedish Council on Health Technology Assessment: Methods of Diagnosis and Treatment in Endodontics: A Systematic Review

Dr Thomas Kvist


### Abstract
The Swedish Council on Health Technology Assessment was founded in 1987 by the Swedish government and is known internationally by its Swedish acronym, SBU. This independent public authority was commissioned for the critical evaluation of methods used to prevent, diagnose, and treat health problems. As an organization on the leading edge of health technology assessments SBU has published almost 300 systematic reviews. Whatever the field of health technology is assessed the questions are the same. Which treatment options are most effective? How can we diagnose problems most accurately? How can we use healthcare resources to achieve optimum benefits? In the period 2008-2010 SBU evaluated the methods used by dentists to diagnose, prevent and treat inflammation and infection of the dental pulp. By applying the thorough and systematic methodology developed by SBU more than 10 000 studies within the field were scrutinized. Furthermore a survey of current practice routines in Sweden and a deliberation of ethical aspects were included. The comprehensive report has been translated to English both in its original form and as Summary and Conclusion and is available at www.sbu.se/Rotfyllning.

### Aims
To present this report to the international endodontic community in order to stimulate discussion and dialogue about what research efforts are needed to improve the evidence-base for diagnosis and treatment in endodontics in the future.

### Objectives
To describe the background and workflow of the report. To present major findings and conclusions of the report. To present some positive effects which came out as a result of the report. To critically discuss the need for different types of knowledge in endodontics.


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12.00 – 12.45

***Panel discussion***
**Participants: Lars Björndal, Markus Haapasalo, Lise-Lotte Kirkevang, Thomas Kvist, Shanon Patel, Paul Wesselink, Gary Hartwell (AAE).**

**Current criteria used for success-failure observations in endodontics, are they reasonable?**
Paul Wesselink

**To what extent can we regard persistent lesions of apical periodontitis a systemic health hazard?**
Markus Haapasalo

**Experiences from conducting a multicentre study on the management of the pulp in teeth with deep caries**
Lars Björndal

**What does it take to conduct clinically relevant research in endodontics?**
**General discussion**

**Funding of research**

12.45 – 13.00

***Commitments of the ESE***
**Claus Löst (ESE President)**

**14.00 – 14.45**
## Persistent dentoalveolar pain (Atypical odontalgia): the patient's perspective Characteristics and impact of PDAP

Dr Justin Durham

### Abstract
Atypical odontalgia and phantom tooth ache/pain have recently been reclassified using an ontological approach as "Persistent Dentoalveolar Pain" [PDAP] (Nixdorf et al 2012). This reclassification aims to provide a sound foundation from which to build a better understanding of the condition. One of the first stages in building a more in-depth understanding of a condition is to critically examine the patient"s experiences of the condition. The examination of patient experiences will identify any characteristics of the condition that may mean it is possible to screen for it at an early stage and also explain the condition"s impact on the individual. Using data from a recently concluded qualitative research study this lecture will explore and illustrate the patient experiences of PDAP both in terms of the characteristics of the pain experience and the impact it has on the patients" everyday lives.

### Aims
To examine patients" experiences of PDAP both in terms of the characteristics of the pain experience and the impact it has on the patients" everyday lives.

### Objectives
To examine patients" reported experiences of PDAP in order to: a. Identify recurring characteristics of pain experienced and identify recurrent characteristics that may help form a putative set of items for a screening instrument b. Understand PDAP"s biopsychosocial impact.

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**14.45 – 15.30**
## Local analgesia

Dr John Meechan

### Abstract
This presentation will cover the different choices that are available when delivering local anaesthetics for dental treatment, particularly in the mandible. It will concentrate on different solutions and techniques.

### Aims
Delegates should be able to determine the most appropriate solution for different mandibular local anaesthetic techniques and understand the impact of general health and drug therapy on the choice of local anaesthetic solution.

### Objectives
To address the following four questions. Are teeth equal in their responses to different local anaesthetic techniques? Is the success of a dental local anaesthetic technique solution-dependent? Do drug interactions occur with dental local anaesthetics at clinical doses? Are the systemic responses to dental local anaesthetic solutions governed by health status?

*I declare I have a past or present financial interest/arrangement, consulting position, or affiliation with the corporate organization(s) whose product(s) I will discuss in my presentation.*

***Endodontic surgery symposium***
**Chair: Professor Bill Saunders**

**16.00 – 16.30**
## General issues on endodontic surgery
Prof Syngcuk Kim

### Abstract
In the modern endodontic specialty practice, endodontic surgery plays an important and essential role in solving clinical dilemmas resulting from nonsurgical endodontic failures, whether they are procedural errors or non-healing PAR. However, it is unfortunate that surgical endodontics has not been emphasized during the specialty training in general. Thus, a majority of endodontists are not confident in this field.
We have made tremendous advancements with instruments and concepts in non-surgical endodontics in the last decade. The advancement of surgical endodontics is even more striking. By utilizing the microscope, microsurgical instruments, ultrasonic tips and MTA, modern microsurgery completely eliminates the shortcomings of traditional surgery. In the process, the success rate of the microsurgical procedure is above 90%. We must incorporate this procedure into the everyday endodontic practice to save teeth.

**16.30 – 17.00**
## Soft tissue management in Endodontic surgery
Dr Christine Peters

### Abstract
Periodontal surgery relies mostly on secondary intention healing after excision of diseased tissue. However, endodontic microsurgery may be undertaken in a healthy or minimally diseased periodontium and allows rapid healing by primary intention, ideally without attachment loss, recession, or scarring. Atraumatic procedures, perfect adaptation of tissue margins and passive, tension-free wound closure are fundamental for proper healing and for successful functional and aesthetic outcomes.

### Aims
The aim of this presentation is to appreciate the current literature regarding events that take place during wound healing after apical surgery and identify factors that help avoid postoperative gingival recession and delayed healing

### Objectives
Key Learning points in this presentation include to:
· Understand up-to-date recommendations in periodontal flap surgery
· Recognize that both intra-operative procedures and wound closure techniques have an influence on inflammation and healing
· Describe which suture materials and techniques are currently recommended for endodontic surgery and understand how early suture removal promotes healing

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**17.00 – 17.15**

## Outcome of endodontic surgery: the past and the present

Dr. Igor Tsesis

### Abstract

Surgical endodontic treatment performed by using the modern technique is a predictable treatment option and presents a valuable alternative to implant placement Numerous studies dealing with the outcomes of endodontic surgery have been published to-date. However, variable study designs, treatment protocols, follow-up periods, and inclusion and exclusion criteria make it difficult to evaluate the influence of various factors on the outcomes. This presentation will discuss a systematic approach for the analysis of research findings and their relevance to modern surgical endodontic treatment. Decision-making algorithm using evidence-based principles will be presented for surgical treatment of teeth with apical periodontitis.

### Aims

Apply the principles of evidence-based dentistry for surgical endodontic treatment and formulate the decision-making algorithm for surgical treatment of teeth with apical periodontitis.

### Objectives

Various treatment choices for teeth with apical periodontitis will be discussed Historical perspective and modern approach for surgical endodontic treatment will be presented Factors that may influence the outcome of endodontic surgery will be identified. Modern protocol for surgical treatment of teeth with apical periodontitis will be evaluated.

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**17.15 – 17.45**

***Discussion and close***

# FRIDAY, SEPTEMBER 13TH
# HALL 3

**The presentations in this Hall are of interest to all delegates but will be of particular interest to practicing clinicians with an interest in root canal treatment as they will provide an update on the key elements of treatment**

**09.30 – 10.15**

## Current concepts in root canal cleaning and shaping, irrigation and disinfection

Dr Jorge Vera

### Abstract

Debridement and disinfection of root canal systems is a difficult task when performing root canal therapy in teeth with apical periodontitis due to the presence of a biofilm and pulp tissue remnants within fins and oval extensions of the root canal system. An understanding of proper cleaning and shaping techniques, irrigant effectiveness, and chemical interactions of irrigants within the root canal become extremely important issues with regards to improving the potential for healing of the periapical tissues.

### Aims

To describe the problems involved in root canal cleaning, shaping and irrigation including the vapour lock effect, and inactivation of irrigants due to improper combination of chemicals and to describe techniques to overcome those problems in order to improve the delivery of irrigants into the entire root canal system.

### Objectives

1. Describe the effective use of NiTi instruments in order to shape the root canal whilst maintaining the original anatomy with sufficient flaring of the apical third 2. Describe the use of instruments and devices to improve the efficacy of irrigants used in the root canal system 3. Illustrate through clinical cases the outcome of treatment in teeth with apical periodontitis.

*I declare I have a past or present financial interest/arrangement, consulting position, or affiliation with the corporate organization(s) whose product(s) I will discuss in my presentation.*

**10.15 – 11.00**

## Irrigation. How to irrigate effectively and safely?

Dr Markus Haapasalo

### Abstract

Instrumentation, irrigation, local medicaments and root filling/sealer all contribute to the eradication of microbes from the infected root canal. Irrigation has also many other roles, it dissolves and removes tissue, balances temperature, helps files to cut dentin safer and more effectively, and kills planktonic and biofilm bacteria. These functions depend on the chemistry and mode of use of the specific irrigants. This presentation discusses the optimal use of the various irrigating solutions with special focus on tissue dissolution, antimicrobial activity and safety. Alternative sequences of the same solutions in irrigation can have very different effects on dentin properties; recommendations will be given to optimize effectiveness and safety. Apical irrigation is nowadays regarded as one of the key areas in irrigation. Factors related to positive pressure irrigation and negative pressure irrigation, apical pressure and apical clearance as well as other facilitators of apical irrigation will be presented.

### Aims

The aim of the presentation is to create a clear understanding of the role of irrigation, the effect of various solutions on soft and hard tissues and biofilm, and give guidelines for safe and effective irrigation with conventional and modern technologies in all parts of the root canal system.

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**11.30 – 12.15**

## Single-file systems
## Is it possible to shape root canals with only one instrument?

Prof Edgar Schäfer

### Abstract

Most recently, a third generation of engine driven NiTi instruments has been introduced, the so-called single-file systems. These instruments are claimed to be able to completely prepare and clean root canals with only one instrument. Two different concepts of these single-file systems can be distinguished: a) Instruments used in a reciprocal motion which are made of a special nickel-titanium alloy called M-wire. The reciprocation working motion consists of a counter-clockwise (cutting direction) and a clockwise motion (release of the instrument), while the angle of the counter-clockwise cutting direction is greater than the angle of the reverse direction. b) Instruments made of conventional NiTi alloy used in a full clockwise rotation.
Although using only one instrument to shape and clean root canals is certainly attractive for daily practice, up to know data regarding the properties of these single-file systems are sparse.

### Aims

Based on the currently best available evidence the question should be answered whether it seems to be possible to shape root canal with only one instrument.

### Objectives

The lecture aims to provide a detailed description of the different single-file systems and an assessment regarding their shaping ability, safety, and cleaning effectiveness. Also other clinically relevant aspects like the preparation time and the tendency of these single-file systems to extrude debris into the periapical tissues will be covered. Moreover, available data regarding the incidence of dentinal defects after root canal preparation with single-file systems will be presented.

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**12.15 – 13.00**

## Shaping and complex root canal anatomy

Dr Frank Paqué

### Abstract

Root canal anatomy is very complex and variations of number and arrangement of root canals are significant in many tooth groups. Root canal treatment of teeth with complex anatomy requires not only basic knowledge about variations in the number of root canals but also knowledge about the possible unique arrangement of the canals. The three-dimensional imaging of teeth using micro-computed tomography is very helpful for the clinician to learn about complex anatomy. Furthermore, scanned teeth can be kept intact and the impact of endodontic procedures on root canal anatomy can be analysed. Beside the evaluation of alterations of root canals after preparation with different instruments side effects like hard tissue debris accumulation into non-instrumented areas can be displayed and calculated.

### Aims

Aim of this presentation is to show and to discuss complex root canal anatomy using three-dimensional reconstructed images based on micro-ct data. Furthermore, the impact of mechanical and chemical root canal preparation on complex root canal anatomy will be discussed.

### Objectives

At the end of this presentation, participants should be able to detail the possible anatomical variations in human teeth and to describe the ability of different chemo-mechanical preparation systems to shape and clean complex root canal anatomy.

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14.00 – 14.45

## Sponsor session: SybronEndo 2

## Safety and Efficacy Considerations in Endodontic Irrigation

Dr Gary Glassman


### Abstract

Perhaps the greatest international attention in recent years has focused on methods to improve endodontic disinfection in the root canal system. The desired attributes of a root canal irrigant include the ability to dissolve necrotic and pulpal tissue, bacterial decontamination with a broad antimicrobial spectrum, the ability to enter deep into the dentinal tubules, biocompatibility and lack of toxicity, the ability to dissolve inorganic material and remove the smear layer, biofilm, ease of use, and moderate cost.

This presentation will focus on evidence based research with respect to the latest most suitable and safe irrigant and irrigant delivery systems that are essential for efficient irrigation and the success of endodontic treatment. Focus will be on the EndoVac using apical negative pressure.


*This Lecture and speaker is sponsored by SybronEndo*

**14.45 – 15.30**

## Sponsor session: DENTSPLY MAILLEFER 1

## Reciprocation and Single File Techniques: 3 years after

Dr Wilhelm – Joseph Pertot


### Abstract

Even though the objectives of endodontic have remained unchanged for the past half century, the evolution in techniques and technology in the last 15 years have made endodontic treatments more reliable and predictable. Amongst these evolutions, the introduction of nickel-titanium instruments in 1995 has revolutionized the shaping procedure. Most of the instruments on the market feature a constant taper and are used in a continuous rotation motion.

In 2000, ProTaper was the first instrument designed with a variable taper.
In 2004, ProTaper Universal was introduced as a further improvement of the initial system.
In 2011, the WaveOne concept, based on the use of reciprocation movement was introduced on the market. This unique movement allowed creates a new concept of «single file shaping technique» and proved to be able to shape canals using one file in more than 80% of the cases. This concept introduced simplicity and safety in root canal preparation for general practitioners.

Two different parameters should be taken into consideration:

1- the reciprocation movement by itself, which has been first studied as an alternative to the continuous rotation motion in most of the existing file systems
2- the «single file shaping techniques»

Based on the studies published in the literature in the past 3 years,
Participants will learn and discuss on:

- the pro and cons of the reciprocation movement in comparison to the continuous rotation motion (elimination of the screwing effect, reduction of the cyclic fatigue accumulation, reduction of the risk of torsional failure).
- The influence of the reciprocation motion and of the single file shaping techniques on root canal transportation, debris extrusion, dentinal cracks, and cleanliness of the root canal system .
- A link will be done between the scientific studies and their impact on the clinical root canal procedure, with discussion of different clinical cases with different root canal anatomies.
- How to use efficiently and safely the single file techniques - what are the limits


*This Lecture and speaker is sponsored by Dentsply Maillefer*

**16.00 – 17.30**

## Sponsor session: DENTSPLY MAILLEFER 2

## Endodontic Canal Preparation: ProGlider / ProTaper Next

Dr Clifford J. Ruddle


### Abstract

Predictably successful endodontics is dependent on fulfilling a series of steps that comprise start-to-finish endodontics. Innovative methods to safely and efficiently secure and shape canals will be identified. Dr. Ruddle will describe new mechanical files that utilize the most proven design features from the past, coupled with the most recent technological advances currently available. This presentation will focus on glide path management and shaping canals, utilizing the single-file ProGlider and the ProTaper Next rotary file system. Emphasis will be placed on creating minimally invasive shapes that promote 3-D disinfection and filling root canal systems.


### Objectives

Understand the mechanical and biological objectives for preparing canals.
Identify the advantages of utilizing a variably-tapered mechanical Glide Path File.
List the technological advancements of 5th generation shaping files.

*This Lecture and speaker is sponsored by Dentsply Maillefer*

# SATURDAY, SEPTEMBER 14TH
# HALL 1

**09.30 – 10.15**

## Microbiology of endodontic infections
## Exploring the nature of the primary infection and its interaction with the host.

Kishor Gulabivala

### Abstract

Although characterisation of microbial diversity has been at the heart of our attempts to understand the endodontic infection, future strategies to control endodontic infections will need to embrace an understanding of microbial and consortium physiology and ecology. Despite a relatively limited genome, microbial consortia exhibit ingenious strategies for sensing changes in the environment, group cooperation and interaction, as well as for launching survival behaviour. Natural selection has ensured that available genes are used strategically to enhance utilisation of available resource or triggering alternative behaviour. The nature of infection dynamics in teeth will be explored, highlighting the direct and indirect evidence available. The possible functional importance of diversity and its role in microbial survival, as well as the hitherto unexplored extra-cellular matrix of the resident endodontic biofilm will be discussed. A better understanding of microbial physiology and behaviour is likely to bring about a more sophisticated approach to controlling intra-radicular biofilms and their interaction with the host.

### Aim

To present a coherent, synthesised, perspective on the biology of endodontic infections and their interaction with the host.

### Objectives:

At the conclusion of the presentation, participants should be able to:

1. Describe the nature of endodontic infections
2. Describe the key characteristics of microbial physiology that determine their survival and host reactions
3. Have visual cues to picture the nature of infections and interaction with the host

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**10.15 – 11.00**

## Microbiology of Endodontic Infections: Recent innovations

Dr Jose Siqueira Jr

### Abstract

Apical periodontitis is a disease caused by a polymicrobial biofilm established primarily within the root canal system. Although fungi, archaea and viruses contribute to the microbial diversity in endodontic infections, bacteria are the most common microorganisms in these infections. Integrated datasets from culture and molecular studies demonstrated that almost 500 unique bacterial species have been identified in endodontic infections. Diversity varies significantly according to the type of infection. Many cultivable and as-yet-uncultivated bacteria have emerged as candidate endodontic pathogens. Recent studies using high-throughput DNA sequencing methods have revealed a still higher bacterial diversity. Sophisticated technology has also contributed to establish the community-as-pathogen concept in endodontics, and to provide a better understanding of the microbial role in symptomatic apical periodontitis and in post-treatment disease.

### Aims

This presentation will discuss some recent innovations in endodontic microbiology brought about by new diagnostic technologies. Special emphasis will be placed on how these methods have contributed to refining the knowledge of diversity of endodontic infections and pathogenesis of apical periodontitis.

## Objectives

· Discussion of the -community-as-pathogen" concept related to the pathogenesis of apical periodontitis · Identification of the main features of the microbiota associated with primary, persistent and secondary intraradicular infections · Recognition of the impact of culture-independent molecular methods in endodontic microbiology

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**11.30 – 12.15**

## Problem solving of iatrogenic damages created during root canal treatment

Dr Fabio Gorni

## Abstract

A percentage of endodontically treated teeth does not successfully respond to the therapy, developing an apical radiolucency after the intervention of the dentist. In presence of symptoms or periapical infection in an endodontically treated tooth with a iatrogenic damage (i.e. perforations, stripping, boken instruments), the dentist should think to the options he can give to the patient in order to solve the problem. Once assessed that the tooth has no vertical fractures and can be restored, the choice is between nonsurgical retreatment and endodontic surgery. Both options have pros and cons, and have precise indications. The clinician is supposed to know which is the best treatment, in order to give the patient the most suitable therapy. Non-surgical retreatment, in the last years, has broadened its field of employment and has remarkably increased its percentage of success. This is due to the new techniques and the novel equipment that help the dentist in solving complex clinical cases with multiple pathologies. The objective of retreatment is to eliminate the obstacles that make challenging the complete shaping, cleaning and filling of the root canal system. Thanks to ultrasonic tips and rotary dedicated instruments, emptying the root canal system is much easier, faster and safer than it was before. The cleaning action of the irrigating solution is extremely improved by he action of US-activated files, guaranteeing a deeper disinfection of the root canal system. The use of an operative microscope allows a better vision of the operative field, making possible to remove safely broken instruments, to go beyond ledges and to repair perforations or stripping of the root. The treatment of perforations has a better prognosis even thanks to the introduction of new biocompatible filling materials such as super EBA or MTA, characterized by the property of setting in a moist environment and sealing the endodontic space.

## Aims

The aim of the lecture is to help the clinician in solving problems linked to the treatment of iatrogenic damages such as perforations or broken instruments.

## Objectives

The lecture will focus on the pre-operative analysis of the case and on the decisional process that brings to the choice of the best therapeutical option for the patient. Every technique will be described in its operative steps, focusing on pros and cons.

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**12.15 – 13.00**

## Differential diagnosis of vertical root fractures in endodontically treated teeth

Aviad Tamse

## Abstract

Vertical root fractures in endodontically treated teeth, is a frustrating phenomenon, both for the patient and the dentist. When diagnosed, usually years after completion of all the procedures in the tooth, it is then necessary to extract the tooth or the root.

The clinical and radiographic diagnosis should be made quickly and accurately. When the fracture line from the root exceeds the gingival margin, the buccal bone resorbs rapidly. The large amount of bone loss complicates future restorative treatment, such as implant placement. It was often difficult to achieve a fast and accurate diagnosis of vertical root fractures in susceptible teeth (maxillary and mandibular premolars) and roots (mesial root of mandibular molars) because clinical signs, symptoms, and radiographic bone radiolucencies resemble either a periodontal problem, or those of root canal treatment failures. As well, probably more than one aetiology exists and there is a natural tendency to delay treatment, i.e. extraction. Recently, both retrospective clinical studies and the development of new diagnostic aids, such as the operating microscope and digital radiography, indicate some typical signs and radiographic features that could help the clinician to make a quick and accurate diagnosis. These include probing defect mainly on the buccal side, sinus tract closer to the gingival margin than to the apical location, typical bone destruction during exploratory flap procedure (Halo) and lateral side bone radiolucencies around the premolars and mesial root of the mandibular molars, and in the latter, also bifurcation bone destruction.

## Aims

This presentation will review the updated information on vertical root fractures in endodontically treated teeth.

## Objectives

Identification the susceptible teeth and roots, and recognize the typical signs and symptoms.
Description of the common radiographic features of such cases.
Recognition of the major causes of fractures and possible ways of preventing them.

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**14.00 – 14.45**

## The role of the endodontist in preserving alveolar bone in young patients

Cecilia Bourguignon


## Abstract

At any age, tooth loss causes collapse of the alveolar bone volume. In children and teenagers, early tooth loss, particularly in the anterior region, has additional dramatic consequences as these patients have to cope with unpleasant aesthetics and function in their everyday life during many years. They cannot receive “permanent” treatment to replace the missing tooth (teeth) until facial growth is completed. To make things worse, temporary appliances are usually uncomfortable, non aesthetic, and need to be replaced regularly in order to adapt to their growing jaws. When these young patients reach the stage when ‘permanent’ treatment might be feasible, the lack of bone renders most prosthetic or implant treatments challenging. Multiple surgical procedures are usually required to rebuild bone height and width, and frequently the resulting aesthetics remain poor. Consequently, there are many advantages in attempting to maintain a tooth or at least a root, even if compromised, for as long as possible. The longer they are retained, the better the chances to preserve alveolar bone volume. This lecture will focus on strategies to manage compromised traumatized anterior teeth. Treatment options to avoid or delay their loss in young patients will be presented and discussed.


## Aims

The aim of this lecture is to discuss the endodontist"s role in preventing the loss of traumatized compromised anterior teeth in young patients in order to avoid the ensuing alveolar bone volume collapse.

## Objectives

Discuss treatment approaches to avoid extraction and prolong the survival of traumatized compromised teeth or roots. Discuss and re evaluate the notion of endodontic “success”, particularly as related to the timing and management of compromised children’s and teenagers’ teeth. Recognize the impact of the proposed approaches in preserving the alveolar bone until facial growth is completed.

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**14.45 – 15.30**

## Dental trauma: What do we know, what do we need to know

Asgeir Sigurdsson


### Abstract

In this day and age of evidence based dentistry many specialty groups have been looking at the evidence backing up their clinical science. The International Association of Dental Traumatology has recently published an updated version of the Treatment Guidelines for Dental Trauma where the best evidence were evaluated and used as much as possible. However it is clear that there are many areas in dental trauma that we do need more research, especially clinical research. This lecture will focus on the new IADT Guidelines and present the evidence that it is based on as well as critically evaluate where the evidence are weak. Suggestions on how organizations like ESE could assist with further our knowledge in dental trauma will be explored. In the last part of the lecture the evidence for prevention of dental trauma will be presented and evaluated and similarly as to dental trauma suggestions on what needs to be done in the near future discussed.


### Aims

AIM: to present the latest IADT Guidelines on treatment of dental trauma as well as issues in prevention of dental trauma and how well those guidelines are supported with literature.

### Objectives

Discuss best evidence treatment and prevention of dental trauma.
Discuss in which areas of these treatment recommendations stronger research is needed.
Discuss how clinical research could be conducted to build stronger evidence base.

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# SATURDAY, SEPTEMBER 14TH
# HALL 2

**09.30 – 10.15**

***Interactive session with audience participation.***
**The audience will be given treatment options and asked to vote on what their decision would be.**

**09.30 – 10.15**

## Maintenance of pulp vitality The deep carious dilemma: interaction between caries progression and vital pulp therapy in non-exposed teeth.

Lars Bjørndal

### Abstract

The understanding of pulp inflammation is of course crucial in endodontics – but at the same time it is a clinical task to deal with the borderlines of reversible pulpitis and irreversible asymptomatic pulpitis. Research has shown that a suggested treatment may vary when the deep carious lesion is examined, reflecting a low level of evidence. Is it however possible to obtain a consensus for the deep carious lesion in the audience. Recent clinical randomized trials have started to emerge perhaps making treatment decision more easy with respect to selection of a non-invasive approach versus an invasive approach. The lecture will be interactive and based on examples of deep carious lesions the audience will select their treatment of choice at the start and at the end of the lecture. Variables such a penetration depth of the carious lesion, caries progression and patient age may play a role for a proper prognosis. A suggested guideline for deep carious handling is presented based on published clinical data,

### Aims

The aim of this presentation is to present aspects of the deep carious dilemma and to incorporate recent advances in clinical research into a practice based guideline in order to obtain a higher degree of consensus.

### Objectives

To raise the insight of deep caries pathology and treatment
To be familiar with a suggested practical guideline for treating the deep carious lesion
To be aware of limitations in the guidelines
To access the pattern of treatment decisions on deep caries in the audience before and after the lecture.

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**10.15 – 11.00**

## Treatment decision making on primary endodontic cases using CBCT technology

Gilberto Debelian

### Abstract

The introduction of Cone Bean Computer Tomography (CBCT) technology in endodontic practice has improved the diagnosis and treatment of endodontic disease. CBCT can identify the presence and anatomic location of radiolucencies as well as inflammatory root resorption more accurately than standard periapical radiographs. Based on this additional information more accurate diagnosis and thus treatment in primary cases can be decided and the prognosis presented to the patient.
In this interactive lecture where cases will be presented and the audience will choose their treatment plans, the major advantages of CBCT will be highlighted such as in the diagnosis of resorptive lesions or in cases of pain with negative findings on the periapical radiographs. In addition limitations like the diagnosis of vertical root fractures will be discussed and cases presented.

## Aims
The aim of this presentation is to highlight the major advantages of the use of CBCT in the diagnosis of endodontic pathologies and consequently a treatment plan.

## Objectives
Key Learning points: · Describe the indication of CBCT in primary endodontic cases · Recognize the advantages and limitations of the use of this technology · Present some cases and interact with the audience to access the opinion of different treatment decisions.

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**11.30 – 12.15**
## Post-treatment disease and retreatment
## Management options for teeth associated with post-treatment disease
Arnaldo Castellucci

## Abstract
In recent years in Endodontics there has been a true explosion of new technologies, new instruments and new materials, which made predictable many procedures that before were considered impossible or just made by chance. In the retreatment field the most important revolution has been the introduction of the surgical operating microscope. In non-surgical endodontics, every challenge existing in the straight portion of the root canal system, even if located in the most apical part, can be easily seen and then solved under the microscope, with magnification and coaxial illumination. In surgical endodontics, today it is possible to make class I cavity preparations perfectly along the axis of the root canal, threedimensionally cleaned and obturated, in a total respect of the root canal anatomy. Thanks to the use of the microscope our success rate is higher after non-surgical and surgical endodontics and our procedures are much more predictable. In conclusion, thanks to the new technology, the new materials and the new instruments the long term success rate in clinical and surgical Endodontics is higher then before and for sure is not inferior to the success rate of implantology. Quite often teeth that are extracted to be replaced by implants can actually be retreated and saved for a long period of time. Let"s remember that the best -implant" is still the natural tooth and that implants have been produced and should be used to replace missing teeth and not to replace existing teeth.

## Aims
The aim of the presentation is to discuss together with the audience the different treatment options in case of severely endodontically compromised teeth. Several cases will be shown and the participants will be asked to vote one of the three treatment options: non-surgical retreatment, surgical retreatment or extraction and implant.

## Objectives
At the end of the presentation the participants should be able to make a correct treatment plan in case of severely endodontically compromised teeth and to understand when the thooth can be clinically or surgically saved and when the only option is the extraction and the implant.

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**12.15 – 13.00**
## Surgical endodontics
Syngcuk Kim

## Abstract
The view that endodontic surgery is the last resort is premised on past experience with surgical instruments unsuitable to the task, inadequate vision within the surgical site, a great number of post-op complications

and failures often leading to extraction of the tooth. This era ended some 15 years ago when stainless steel ultrasonics and the microscope, along with MTA were introduced. Some 15 years later new advancements are knocking on our door. Stainless steel ultrasonic tips are replaced by microprojection tips, microscope is advanced to power zoom scope and MTA is being replaced by Bioceramic. These advancements allow clinicians to perform the procedures with ease and a higher success outcome. In this session the details of advancements will be discussed.

**14.00 – 15.30**

***Education symposium***

**Led by John Whitworth and Michael Hülsmann with talks from Vytaute Peciuliene and Jale Tanalp**

**14.00 – 14.10**

## Introductory remarks – Developing our support of European Endodontic teachers

Dr John Whitworth

### Abstract

This session is designed to initiate a forum for teachers of Endodontology. During this session, we will be inviting speakers from different regions within Europe to share their experiences and challenges as undergraduate teachers to Endodontology, and to initiate discussion within the group on the key challenges we face.
By meeting together in this way, we hope to promote fellowship and understanding within the body of Endodontic teachers, to identify common themes and to build an agenda for future educational events.
We look forward to your interactive participation very much.

### Aims

1. To initiate a forum for European teachers of Endodontology.
2. To identify some f the key challenges we face a European teachers of Endodontology.
3. To build an agenda for future educational events of the ESE.

### Objectives

1. To provide an opportunity for European Endodontic teachers to meet and enter into structured discussion.
2. To listen to the thoughts and views expressed and define an agenda for future meetings and activities.

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**14.10 – 14.30**

## The triumphs and challenges of undergraduate endodontic teaching 1

Dr. Vytaute Peciuliene

**14.30 – 14.50**

## The triumphs and challenges of undergraduate endodontic teaching 2

Jale Tanalp

**14.50 – 15.30**

## Discussion - defining our key challenges, and developing support for endodontic educators in Europe

Prof Michael Hülsmann

# SATURDAY, SEPTEMBER 14TH
# HALL 3

**The presentations in this Hall are of interest to all delegates but will be of particular interest to practicing clinicians with an interest in root canal treatment as they will provide an update on the key elements of treatment.**

**09.30 – 10.15**

## Clinical use for novel calcium-silicate bioactive materials

Prof Carlo Prati- Co-author: Maria Giovanna Gandolfi


### Abstract

Calcium silicate-based (MTA-like) cements have been proposed as a new family of materials based on the initial ProRoot MTA. Recent investigations suggest many interesting biological properties that support their use in a number of endodontic clinical applications. Initially, MTA cements were proposed as root-end filling materials and later they were proposed for root/pulp chamber perforation repairs, for pulp capping, for dentine hypersensitivity and for root canal filling with and without gutta-percha. All calcium-silicate cements are well tolerated by bone and periapical tissues, are biocompatible and support bone-forming cells to produce new bone and reparative tissue. There is evidence that they can remineralize dentine and may prevent dentine demineralization. The most important properties of calcium silicate cements are related with their bioactivity, which means they can induce the formation of apatite layers and deposits when in contact with bone tissue or simulated body fluids in vitro. Because they are hydraulic materials they can set in humid environment such as blood contaminated root canals and can expand to increase their marginal adaptation in moist canals. Moreover, calcium-silicate cements may be doped with fluoride or other components to improve and modify their properties. For example, new flowable calcium silicate sealers have been developed recently. Calcium silicate sealers induce the formation of apatite on their surface and release ions such as Calcium. On the contrary, many conventional root canal sealers have a delayed or absent apatite-forming ability. For these reasons, calcium silicate materials allow better cell proliferation and bone formation compared to conventional root canal sealers and may play a novel and attractive role in root canal therapy problems.


### Aims

To give an overview of the constituents, properties and performance of calcium silicate materials.

### Objectives

To describe the properties of commercially available sealers, filling systems and their properties.
To describe recent laboratory and clinical investigations on calcium-silicate cements and sealers.
To examine the problems involved in root canal filling with conventional and calcium silicate-based sealers.
To analyze the rationale for the use of calcium silicate sealers and the methods of application with gutta-percha.

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**10.15 – 11.00**

## 3D obturation of root canals: the challenge of oval canals

Zvi Metzger

### Abstract

3D obturation of the root canal is a common desired goal of all methods of root canal treatment. In narrow and round canals this goal can easily be achieved. Nevertheless, oval canals present a challenge that requires some additional considerations.
Cleaning and shaping of such oval canals represent the first challenge, as debris remaining in or packed into un-instrumented recesses may prevent adequate 3D adaptation of the root filling to the canal walls. Various methods that were designed to allow effective cleaning of these areas will be reviewed and discussed.
Selecting a proper master cone is the second challenge. Many rotary file systems provide gutta-percha master cones that are designed to fit the last instrument used. Conceptually, this means that the canal is prepared to fit the shape of a given industrial master cone. Flat canals represent a challenge to this concept.
In a flat oval canal, prepared by any instrumentation method, a round industrial master cone will fail to fit the 3D shape of the canal. In such canals the concept should be reversed: a master cone should be prepared to fit the shape of the ready-to-fill canal. Customized master cones can be prepared for any shape of canal by taking an impression of the apical part of the canal on a gutta-percha cone softened with chloroform. The cone is then removed, allowed to dry and used as a solid gutta-percha master cone. This simple process will be explained and demonstrated. Such customized cones may be used effectively with lateral compaction or as the first cone for warm gutta-percha compaction. It allows good apical control as well as good adaptation to any round or non-round shape of root canal. Clinical cases will be presented and the concept explained and discussed.

### Aims

The aim of the presentation is to draw the attention of clinicians to the unique problems encountered when attempting to 3D fill oval root canals and suggest methods to overcome these challenges.

### Objectives

At the conclusion of the presentation the participants will be able to: (1) Describe the incidence of oval and flat-oval canals. (2) Describe the inability of traditional planar radiographs to reveal them, as opposed to axial views of CBCT scans. (3) Describe the effect that debris remaining in or packed into un-instrumented recesses may have on the 3D adaptation of root fillings. (4) Describe the methods used to eliminate such debris. (5) Describe the limitation of industrial master cones when filling oval canals. (6) Prepare customized gutta-percha master cones that may be used in round or oval canals. (7) Describe how such master cones may be used in either lateral compaction or warm gutta-percha root filling methods

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**11.30 – 12.15**

## Retreatment: where is the limit?

Dr Pedro Cruz

### Abstract

Retreatment: where is the limit?
There has been a revolution in Dentistry in the last 20 years and Endodontics is a good example. Nevertheless, with the increasing popularity of implant placement, endodontists are constantly being bypassed and questioned about extracting failed endodontically treated teeth, although nonsurgical endodontic retreatment and surgical microendodontics gives good results in most cases, provided proven techniques are used. Moreover the extraction approach can lead to marked alveolar bone crest collapse, mainly in the cases where nothing is done to prevent it, and may compromise implant placement that ultimately will be disadvantageous to our patients. In fact Endodontics has now evolved into Microendodontics and by using state-of-the-art equipment, instruments

and materials that match biological concepts, used with clinical practice, it is now possible to produce predictable outcomes in the healing of most of the lesions of endodontic origin, and obtain success rates similar to those of implantology. In many situations clinical decision making is difficult and patient preferences become very important. This clinical-based presentation emphasizes the importance of microendodontics as an essential part of any successful endodontic practice and well-documented cases will be presented, with slides and videos, that will help to understand the limits and the potential of this "new" Endodontics (surgical and non surgical).

## Aims

To describe the problems involved in root canal retreatment and the importance of microendodontics to overcome many clinical situations. To explain the limits and the potential of this "new" Endodontics (surgical and non surgical).

## Objectives

Based on a series of clinical cases the lecture will focus on:
-clinical decision making: rationale for extraction or retreatment (surgical or non surgical); -techniques for removal of cast-posts and metallic posts; -techniques for removal of gutta-percha carriers, silver points, fiber-posts and fractured instruments; -microsurgery: how to treat an apicomarginal defect (Kim's class F).

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**12.15 – 13.00**

## Post-endo restoration: managing the gap

Marco Martignoni

## Abstract

Modern endodontics offers great opportunities in term of simplicity and predictability of results.
Post-endodontic restoration shows well known problems and limitations. Residual space geometry is not ideal for materials commonly used, it can be dishomogeneus and as final result it becomes difficult to adapt prefabricated posts to the canal left.
A number of evidences state the importance of the coronal restoration of endodontically treated teeth in order to obtain the reestablishment of the system. It is necessary to seal coronally the systems after obturation and may the seal be as close as possible to dentine inside the remaining space left in the canal.
The intra canal restoration based on adhesive techniques and composites will be then consequential to the endodontic therapy and, thank to the last generation composites, can be obtained weather there will be used posts or only composite in the most predictable way.
Endodontic treatment seen in its total integration with the restoration tends to be rapid, reliable and simplified when new materials are used.
Importance will be given the different variables influencing the restoration interface and the gap formation when posts are used as well as when posts are not used.
Different modalities of post endo restoration will be analyzed from either a clinical point of view as well as a microstuctural point of view.

## Aim:

To get information regarding different modalities for post endodontic restoration in order to accomplish ideal and simple monoblock structure.

## Objectives:

To be able to judge when to use fibre post to support restoration and when not to.

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**14.00 – 14.45**

## Sponsor session: SybronEndo 3

## TF ADAPTIVE - a novel approach to canal instrumentation

Prof Gianluca Gambarini

### Abstract

In the last years with the introduction of reciprocation simplicity has been advertised as a main improvement in endodontic shaping procedure. However, the introduction of 3d technologies has shown that root canal anatomy is not simple, and more attention needs to be paid on the quality of shaping and cleaning procedures. Therefore instrumentation techniques should combine simplicity with quality, aiming at providing adequate body shaping and apical preparation, and consequently a favorable endodontic space for enhanced final cleaning and obturation procedures. The lecture will show the latest improvements in NiTi instrumentation, describing a new approach: TF Adaptive. The advantages of the new technique will be shown, explaining the key feature points: the new motion, which is a unique combination of continuous rotation and reciprocation, the benefits of TF technology in such motion, and the clinical use of the new sequences which are designed to fit all canals, combining excellent shaping results with simple and easy to perform procedures. The creation of an endodontic glide path with reciprocating SS instruments will be also presented and discussed.

*This Lecture and speaker is sponsored by SybronEndo*

**14.45 – 15.00**

## Sponsor session: VDW

## New Trends in Root Canal Preparation. Part 1

Nicola Grande

### Abstract

Root canal preparation represents the main phase of the endodontic treatment in order to chemically and mechanically clean the endodontic space before to seal it properly. Anatomical complexities of root canals represent the main issue in root canal preparation, enhancing the difficulties in preventing and solving endodontic problems. The first part of the lecture will analyse the latest evolutions of Nickel-Titanium (NiTi) rotary files. Since their introduction, NiTi files have been deeply changed and modified in the design and step-by-step clinical use. The main paradigm shifts are changing the pure crown-down approach mainly in terms of using small files at the beginning of the preparation, thus introducing instrumentation sequences which increase tip size and taper progressively and in terms of using each rotary NiTi file of the sequence to the working length. These small files can be used also to establish the glide path without prior use of stainless-steel hand files, which represents a big challenge today. Furthermore, the progressive increase of the cutting efficiency and flexibility of the instruments have reduced the number of the files used in each sequence.

### Aims

The aim of the lecture is to analyse the latest changes in this field of the endodontic science, which are strictly linked with the development of new materials, devices and technical procedures that are changing the protocols in endodontic root canal preparation.

*This Lecture and speaker is sponsored by VDW*

15.00 – 15.30

## Sponsor session: VDW

## New Trends in Root Canal Preparation. Part 2

Dr Gianluca Plotino


### Abstract

The second part of the lecture will describe the latest developments of the endodontic technology, in order to understand advantages and disadvantages of the new modified NiTi alloys, characterised by new manufacturing methods and materials and changes in the metallurgy of the files that deeply modify their mechanical properties and clinical behaviour. Reciprocating movement instead of continuous rotation has been recently applied to NiTi files to reduce the fracture risk and enhance their clinical performance, including the possibility to introduce the single-file instrumentation approach. Finally, future possibilities of the root canal instrumentation phase will be presented and discussed. The selection of the appropriate instrument and technique for the specific clinical scenario is important to obtain maximum results in the long-term period. Particular attention will be given on how to treat even the most complex cases and to avoid procedural errors and unexpected fractures of nickel-titanium endodontic instruments.


### Aims

The aim of the lecture is to analyse the latest changes in this field of the endodontic science, which are strictly linked with the development of new materials, devices and technical procedures that are changing the protocols in endodontic root canal preparation.

*This Lecture and speaker is sponsored by VDW*

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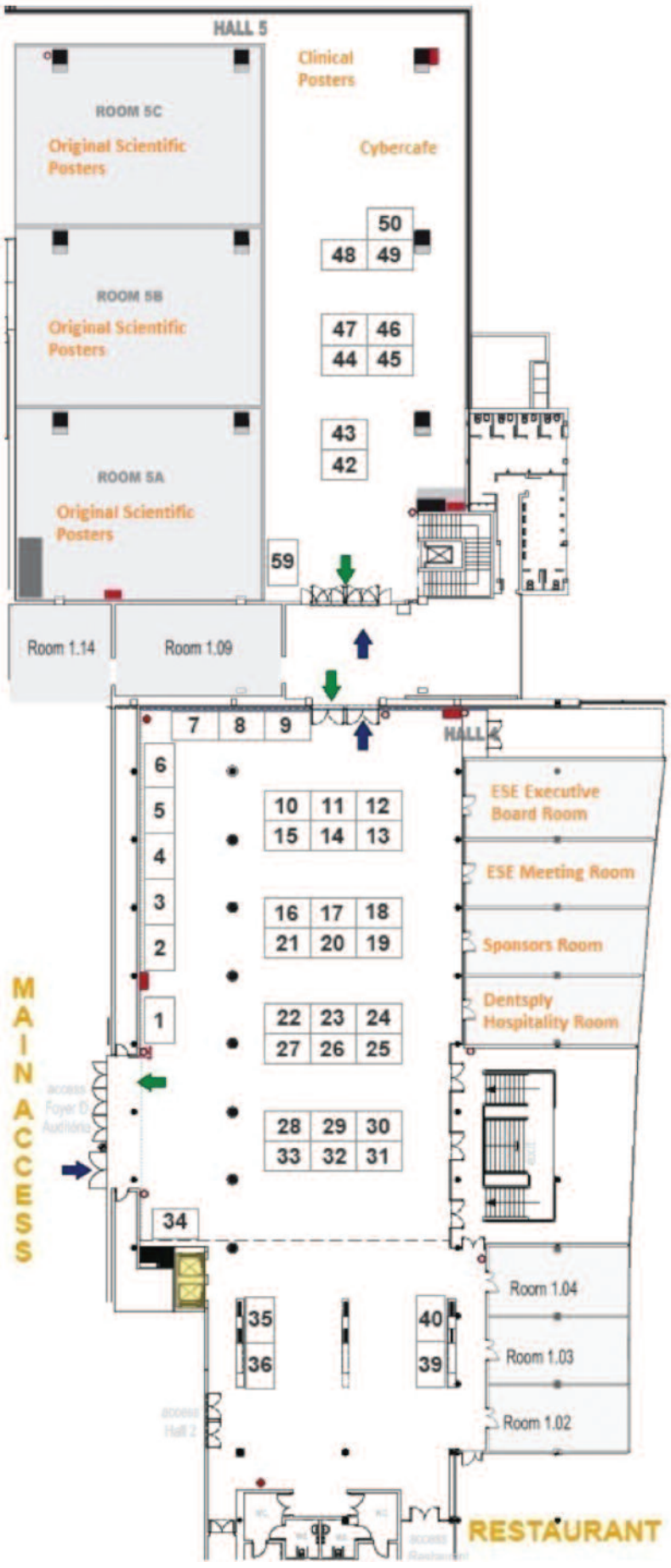


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