

# Journal Club Presentation

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It is a vital and core activity of any research to gather and discuss about a published article.

This discussion is to criticise the knowledge and evaluate the content presented in published article.

## Critical appraisal

It is the process of carefully and systematically examining research to judge its trustworthiness, value and relevance in a particular context.

**NOT EVERYTHING THAT IS PUBLISHED IS CORRECT!!**

## Amis of Journal Club

- To develop the ability of researcher to critically analyse research articles and continuously evaluate the published scientific knowledge.
- To improve the critical appraisal skills for the researchers.

## Amis of Journal Club

- To understand the method of publication.
- To increase the knowledge about the research methodology and biostatistics.
- To improve clinical practice by increasing the exposure to the latest research findings.

# Journal Club Presentation

The screenshot shows the ScienceDirect interface for an article in the Journal of Endodontics. The article title is "Removal of Calcium Hydroxide from Artificial Grooves in Straight Root Canals: Sonic Activation Using EDDY Versus Passive Ultrasonic Irrigation and XPendo Finisher". The authors listed are David Donnermeyer, Hendrik Wyrsh, Sebastian Bürklein, and Edgar Schäfer. The article is categorized as "Basic Research". The page includes a sidebar with navigation options like "Outline", "Highlights", and "Abstract". There are also sections for "Recommended articles", "Citing articles (9)", and "Article Metrics". A "FEEDBACK" button is visible in the bottom right corner.

- Purpose for choosing this article
  - ✓ Related to your topic
  - ✓ You can tell that in the beginning or during the presentation

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- Article title
  - ✓ Is this title long or short
  - ✓ Is it descriptive, none descriptive or over descriptive

# Journal Club Presentation

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Outline Highlights Abstract Key Words Materials and Methods Results Discussion Conclusion Acknowledgments References Show full outline

Journal of Endodontics Volume 45, Issue 3, March 2019, Pages 322-326

Basic Research

## Removal of Calcium Hydroxide from Artificial Grooves in Straight Root Canals: Sonic Activation Using EDDY Versus Passive Ultrasonic Irrigation and XPendo Finisher

David Donnermeyer Dr.med.dent. \*, Hendrik Wyrach DMD \*, Sebastian Bürklein PD, Dr.med.dent. †, Edgar Schäfer Prof. Dr.med.dent. †

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Citations

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Figures (2)



- Publication details year, vol, pages



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Journal of Endodontics  
Volume 45, Issue 3, March 2019, Pages 322-326



- Journal details:

Names of Journal: JOE

Journal description: Official journal of the American Association of Endodontists.

Peer reviewed hybrid access journal.

Impact Factor and Cite Score:  
(index for Clarivate)                      (index for Elsevier)



Publisher: Elsevier

# Journal Club Presentation

The screenshot shows the ScienceDirect interface for a research article. On the left, there is a navigation menu with options like 'Outline', 'Highlights', 'Abstract', 'Key Words', 'Materials and Methods', 'Results', 'Discussion', 'Conclusion', 'Acknowledgments', 'References', and 'Show full outline'. The main content area features the journal title 'Journal of Endodontology', volume and issue information, and the article title. Below the title, the authors' names and affiliations are listed. There are also options to 'Add to Mendeley', 'Share', and 'Cite'. On the right side, there are sections for 'Recommended articles' and 'Citing articles (9)'. A 'FEEDBACK' button is visible at the bottom right of the article page.

- Number citation (could be present on Google scholar)

Any time  
Since 2022  
Since 2021  
Since 2018  
Custom range...

Sort by relevance  
Sort by date

## Removal of calcium hydroxide from artificial grooves in straight root canals: sonic activation using EDDY versus passive ultrasonic irrigation and XPendo Finisher

D Donnermeyer, H Wyrusch, S Bürklein, E Schäfer - Journal of endodontology, 2019 - Elsevier

Introduction The aim of the present study was to compare sonic activation using EDDY (VDW, Munich, Germany), passive ultrasonic irrigation (PUI), and mechanical activation using the XPendo Finisher (FKG Dentaire, La Chaux-des-Fonds, Switzerland) for the removal of calcium hydroxide from artificial grooves in straight root canals. Methods The root canals of 90 human maxillary incisors with straight root canals were prepared using Mtwo files (VDW) up to size 10/04, and the teeth were split longitudinally. A lateral groove in the ...

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# Journal Club Presentation

The screenshot shows the ScienceDirect interface for a research article. At the top, there are options to 'View PDF', 'Access through your institution', and 'Purchase PDF'. A search bar is located in the top right corner. The article title is 'Removal of Calcium Hydroxide from Artificial Grooves in Straight Root Canals: Sonic Activation Using EDDY Versus Passive Ultrasonic Irrigation and XPendo Finisher'. The journal is 'Journal of Endodontics', Volume 45, Issue 3, March 2019, Pages 322-326. The authors listed are David Donnermeyer, Hendrik Wyrach, Sebastian Bürklein, and Edgar Schäfer. The article is categorized as 'Basic Research'. On the right side, there are 'Recommended articles' and 'Citing articles (9)'. The 'Figure' section shows two images: a grayscale cross-section of a root canal and a color-coded 3D model of the root canal.

- Type of paper: research paper (original research), or could be literature review, letters for editor etc..
- Type of study: Experimental in vitro study

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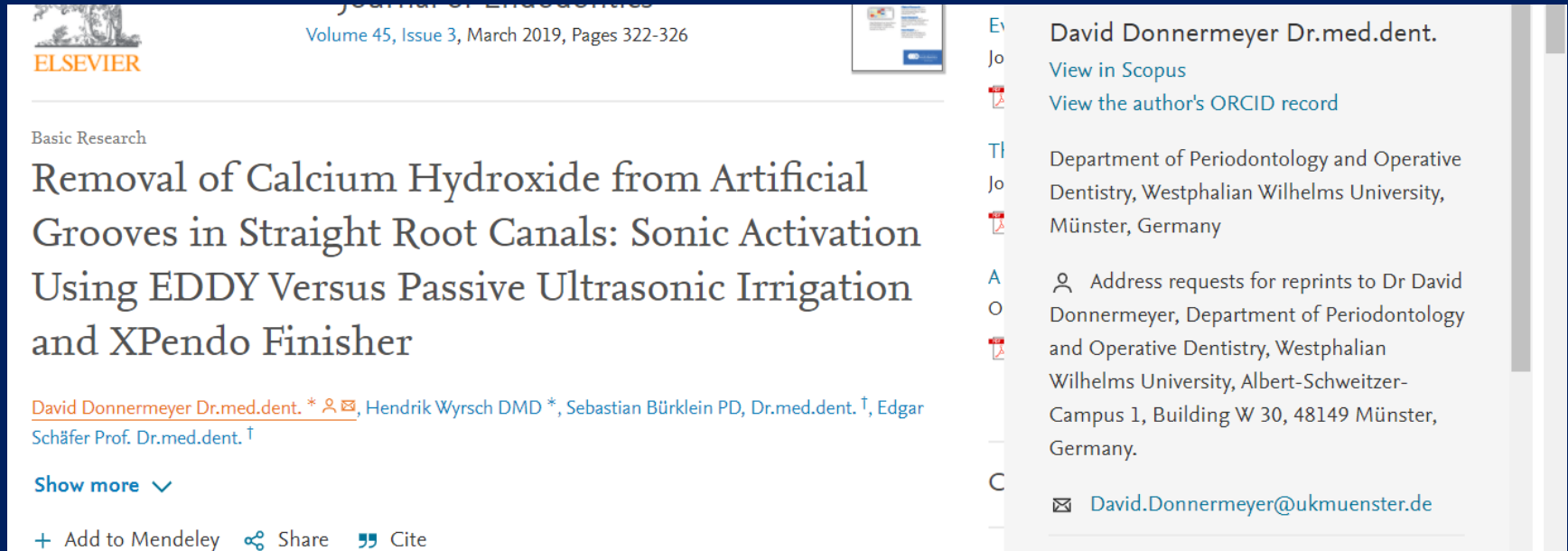
The screenshot shows the ScienceDirect interface for a journal article. At the top, there are options to 'View PDF', 'Access through your institution', and 'Purchase PDF'. A search bar is located in the top right corner. The article title is 'Removal of Calcium Hydroxide from Artificial Grooves in Straight Root Canals: Sonic Activation Using EDDY Versus Passive Ultrasonic Irrigation and XPendo Finisher'. The authors listed are David Donnermeyer, Hendrik Wyrsch, Sebastian Bürklein, Edgar Schäfer, and Prof. Dr.med.dent. †. Red arrows point to the author names. The article is categorized as 'Basic Research' and is from the 'Journal of Endodontics', Volume 45, Issue 3, March 2019, Pages 322-326. The page also features a 'Recommended articles' section on the right and a 'Team Leader' label pointing to the author list.

- Authors and Authorship

Names, Affiliation, Contribution

You can give some information about one of the authors if they are famous in the field

# Journal Club Presentation






Journal of Endodontics  
Volume 45, Issue 3, March 2019, Pages 322-326



ELSEVIER

Basic Research

## Removal of Calcium Hydroxide from Artificial Grooves in Straight Root Canals: Sonic Activation Using EDDY Versus Passive Ultrasonic Irrigation and XPendo Finisher

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David Donnermeyer Dr.med.dent.  
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 David.Donnermeyer@ukmuenster.de

- Authors and Authorship  
Names, Affiliation, Contribution

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- Study fund: it is important to understand the rights for this publication return to which university, institute, company or authors themselves.
- Conflict of interest: it is important to evaluate the bias that the author may have with the results of the study

## Basic Research—Technology

### Conclusion

Complete removal of calcium hydroxide from root canals was not achieved with any of the techniques. Manual irrigation was significantly less effective compared with all other activation techniques. EDDY and PUI were significantly more effective in the removal of calcium hydroxide than the XPEndo Finisher regarding the apical grooves. No difference was found in the coronal section.

### Acknowledgments

*The authors deny any conflicts of interest related to this study.*



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9. Urban K, Donnermeyer D, Schäfer E, et al. Canal cleanliness using different irrigation activation systems: a SEM evaluation. *Clin Oral Investig* 2017;21:2681–7.

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- Introduction:

Is the author give a good background about the literature in the field of the topic.

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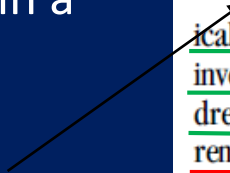
- Introduction:

Is the author give a good background about the literature in the field of the topic.

- Problem statement

Is the problem is vital and stated in a clear sentence.

Passive ultrasonic activation



thermomechanically treated NiTi alloy named MaxWire (Martensite-Austenite-electropolish-fileX) (15). These instruments are relatively straight in their M phase (martensitic state) at room temperature; they change to a curved shape when exposed to intracanal temperature because of a phase transformation to A phase (austenitic state) (15). This phase transformation allows the instrument to expand its extent 6 mm in diameter when rotated (16).

PUI (4, 8, 17), manual irrigation with a syringe (8), and mechanical activation using the XPendo Finisher (18–21) have been investigated regarding the removal of intracanal calcium hydroxide dressings. The results concerning the efficacy of these devices in the removal of calcium hydroxide are controversial. Although 1 study reported that the XPendo Finisher was superior in removing intracanal calcium hydroxide dressings compared with PUI (18), other investigations found no statistically significant differences between the devices (19–21).

The aim of this study was to compare 4 different irrigation techniques regarding the removal of calcium hydroxide from lateral grooves in root canals: sonic activation with EDDY, passive ultrasonic activation, mechanical activation with the XPendo Finisher, and manual irrigation with a syringe. The null hypothesis tested was that all 4 techniques perform equally regarding the amount of remaining intracanal dressing.

## Materials and Methods

Based on the data of a comparable and previous study (22), some



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- Aims/ Objectives

Are the aims directed toward solving the problem.

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- Aims/ Objectives

Are the aims directed toward solving the problem.

- Hypothesis

Is the hypothesis simple and correct.

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## Journal Club Presentation

- **Materials and Methods:** critically explore each part of the method to understand the research methodology and to compare the work with other similar methods in literature. This could include the dependant articles that the author may use in the design of their method.

# Journal Club Presentation

## Method design

Is methodology designed according to pilot study or previous investigations

Pilot study (if present)

### **Materials and Methods**

Based on the data of a comparable and previous study (22), power calculation using G\*Power 3.1 (Heinrich Heine University, Düsseldorf, Germany) indicated that the sample size for each group should be at least 17. Thus, 20 canals were used for each experimental group.

The present study is based on study designs previously suggested (8, 23). Ninety extracted central maxillary incisors with straight single roots (curvature  $<5^\circ$ ), a length of a minimum of 18 mm, intact root tips, and a single root canal were included. This was verified by viewing their buccal and proximal radiographs and the measurement

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## Sample size

Validity of the sample size or population of the study.

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## Sample type

- Criteria for sample selection.
- Inclusion or exclusion criteria.
- Are the selection procedure valid and not bias.

Eg. The initial size for the selected root was not none

# Journal Club Presentation

## Sample preparation

- Explore the sample preparation critically to identify if there is a weak or unstandardized step during the procedure.
- Evaluate the steps of method during the presentation

After preparation of the access cavity, the root canals were instrumented using Mtwo NiTi files (VDW) up to size 40/.04 using the torque-limited electric motor VDW.Silver (VDW) with the settings according to the manufacturer's instructions. Apical patency was checked before instrumentation and after each instrument using ISO size 10 K-files (VDW). During instrumentation, irrigation was performed with a 30-G open-ended needle (Navitip; Ultradent, South Jordan, UT) and 1.5 mL NaOCl 3% after each instrument. The final irrigation was performed with 5 mL EDTA 17% (contact time of 1 minute). All irrigation solutions were used at a temperature of 20°C.

After the preparation of 2 longitudinal grooves at the mesial and distal root surface, the roots were split longitudinally. Gap-free reassembly of the 2 root halves was checked with a stereomicroscope under 20× magnification (Expert DN; Müller Optronic, Erfurt, Germany).

Two grooves (4-mm long, 0.2-mm wide, and 0.5-mm deep) were prepared at 2 levels at a distance of 2–6 mm from the apex on the buccal side of the root canal and at a distance of 10–14 mm from the apex on the oral side of the root canal (Fig. 1). Individual silicone molds (Silaplast; Detax, Ettlingen, Germany) were made for each root half to maintain a constant position, and photographs were taken under 10× magnification using a laser scanning microscope (VK-X100; Keyence, Osaka, Japan). The grooves were filled with an aqueous calcium hydroxide suspension, and photographs were taken at 10× magnification.

The root halves were reassembled and fixed with wax. The apical foramen was covered with wax in order to simulate a closed system (25), and the roots were embedded into plastic tubes with silicone (Silaplast). After storing the specimens in an incubator (Memmert, Schwabach, Germany) at 37°C and 100% humidity for 7 days, the roots were

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## Sample grouping

- The sample grouping randomisation procedure has to be mentioned to avoid bias and ensure validity.
- All groups should have similar sample size (including controls).
- The control samples should be processed under similar conditions.

laplast). After storing the specimens in an incubator (Mettler, Schwabach, Germany) at 37°C and 100% humidity for 7 days, the roots were randomly divided into 5 groups. Further procedures were as follows (groups A–D,  $n = 20$ ; group E,  $n = 10$ ).

Not clear randomisation procedure

### Group A: Sonic Activation with EDDY

Before each cycle of activation, 3 mL NaOCl 3% was applied to the root canal with a syringe. The irrigant was activated with a frequency of 6000 Hz and an amplitude of 160  $\mu\text{m}$  using an air scaler (KaVo SONIC-flex; KaVo, Biberach, Germany). The EDDY tip was placed 1 mm short of the working length, and in-and-out movements with an amplitude of 5 mm were performed. Irrigation was repeated 4 times for 30 seconds, resulting in a total of 2 minutes of irrigation with a total of 12 mL irrigant.

### Group B: PUI with VDW Ultra (VDW)

Before each cycle of activation, 3 mL NaOCl 3% was applied to the root canal with a syringe. The irrigant was activated as recommended by the manufacturer with a frequency of 28,000 Hz using a file size of 25 (Irri-S 21/25, VDW). The Irri-S tip was placed 1 mm short of the working length, and in-and-out movements with an amplitude of 5 mm were performed. Irrigation was repeated 4 times for 30 seconds, resulting in a total of 2 minutes of irrigation with a total of 12 mL irrigant.

### Group C: Mechanical Activation with the XPendo Finisher

The XPendo Finisher NiTi file was used as recommended by the manufacturer at a speed of 1000 rpm and a maximum torque of 1 Ncm using the torque-limited electric motor VDW.Gold (VDW). Before each cycle of activation, 3 mL NaOCl 3% was applied to the root canal with a syringe. The XPendo Finisher file was placed 1 mm short of the working length, and in-and-out movements with an amplitude of 5 mm were performed. Irrigation was repeated 4 times for 30 seconds, resulting in a total of 2 minutes of irrigation with a total of 12 mL irrigant.

### Group D: Manual Passive Irrigation with a Syringe

A 5-mL syringe with a 30-G needle (Navitip) was placed 1 mm short of the working length into the canal, and in-and-out movements with an amplitude of 5 mm were performed; 3 mL NaOCl 3% was applied over 30 seconds. This was repeated 4 times, resulting in a total of 2 minutes of irrigation with a total of 12 mL irrigant.

### Group E: The Control Group

No irrigation was performed. The root canals were dried with paper points, and the root halves were separated again. Photographs were taken at 10 $\times$  magnification using the individual silicone molds and the laser scanning microscope (Fig. 2A–C).



# Journal Club Presentation

## Testing procedure

- Types of the tests used and giving brief description about each.
- Are these tests performed in a correct way?

per points, and the root halves were separated again. Photographs were taken at 10× magnification using the individual silicone molds and the laser scanning microscope (Fig. 2A–C).

The amount of calcium hydroxide remaining in the grooves was independently scored by 2 calibrated and blinded operators according to the scoring system suggested by Lee et al (23). The calibration of the operators included scoring and discussion of 50 specimens 5 days before the blinded scoring procedure.

The following scores were used: 0, empty groove; 1, <50% of the cavity is filled with calcium hydroxide; 2, >50% of the cavity is filled with calcium hydroxide; and 3, the cavity is completely filled with calcium hydroxide. The scoring results were expressed as medians and analyzed using the Kruskal-Wallis test. The level of significance was set  $P = .05$ . The Cohen kappa value was calculated for interexaminer agreement.

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## Measurements

- How the variable measured?
- Check for miss information bias or detection bias.
- Check for masking or blinding.

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## Statistical analysis

- How were the data analysed.
- Appropriate test.

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# Journal Club Presentation

- Results
  - What are the results?
  - Are they clearly presented and understandable?
  - How were the results interpreted?
  - Are the interpretations appropriate?

**TABLE 1.** The Scoring Results of the Apical and Coronal Grooves

	Group	Median	Interquartile range	Minimum	Maximum
Apical	EDDY	1.0 <sup>a</sup>	2.0	0.0	3.0
	PUI	1.0 <sup>a</sup>	2.0	0.0	3.0
	XPendo Finisher	2.5 <sup>b</sup>	1.0	1.0	3.0
	Manual irrigation	3.0 <sup>c</sup>	0.0	2.0	3.0
	Control group	3.0 <sup>c</sup>	0.0	3.0	3.0
Coronal	EDDY	2.0 <sup>a</sup>	2.0	0.0	3.0
	PUI	2.0 <sup>a</sup>	1.0	0.0	3.0
	XPendo Finisher	2.5 <sup>a</sup>	1.0	1.0	3.0
	Manual irrigation	3.0 <sup>b</sup>	0.0	2.0	3.0
	Control group	3.0 <sup>b</sup>	0.0	3.0	3.0

PUI, passive ultrasonic irrigation.

Values with different superscript letters were statistically different at  $P = .05$  (Kruskal-Wallis test).

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- Discussion

- Is the discussion directed toward the research question of study and the aims.

- Is the author discuss the methodology and the standardisation procedures of the work.

- What are the strengths of the study?

- Is controversy presented about the topic (agreement, disagreement) and is the author discuss that according to the results of the study.

# Journal Club Presentation

- Discussion

- What are the study weaknesses, limitations and flaws?

- Do the author mention them?

transformation to A phase (austenitic state) (15, 16). In the present study, attempts have been made to standardize experimental conditions, and, therefore, all irrigation solutions were used at a temperature of 20°C. Based on the obtained results, it might be of interest to reevaluate the dressing removal capacity of XPendo Finisher files using increased and different temperatures of the irrigants.

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- Conclusions

- Is the conclusions summarising the findings of the study.

- Do the findings contribute to the overall knowledge of the topic.

- What additional questions does the study raise.

# Journal Club Presentation

## Pros and Cons

Give a summery about the Pros and Cons that you found in each section of the study. E.g.

### Pros

Good study design

Valid research question

### Cons

The procedure of randomised sample grouping is not presented.

The testing procedure is vague and not clear.



