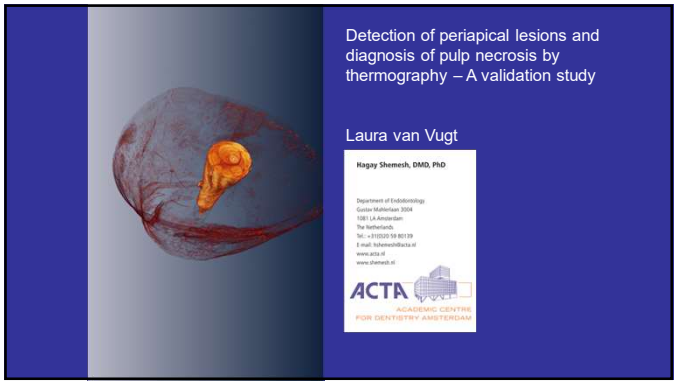
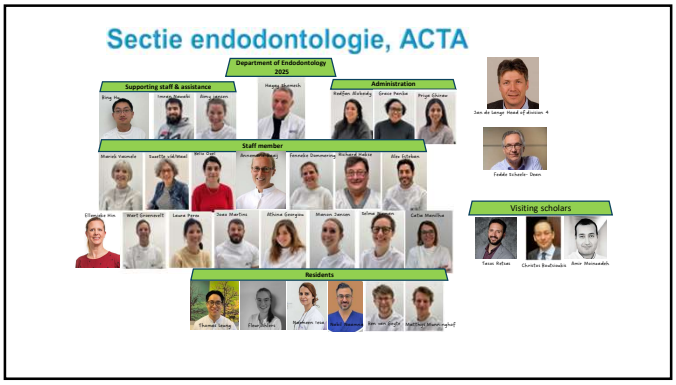

Detection of periapical lesions and diagnosis of pulp necrosis by thermography – A validation study
Laura van Vugt
Hagay Shemesh, DMD, PhD
ACTA
ACADEMIC CENTRE FOR DENTISTRY AMSTERDAM

1


Sectie endodontologie, ACTA
Department of Endodontology 2025
Supporting staff & assistance
Administration
Staff member
Visiting scholars
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2


Tandheelkunde scholen in Nederland
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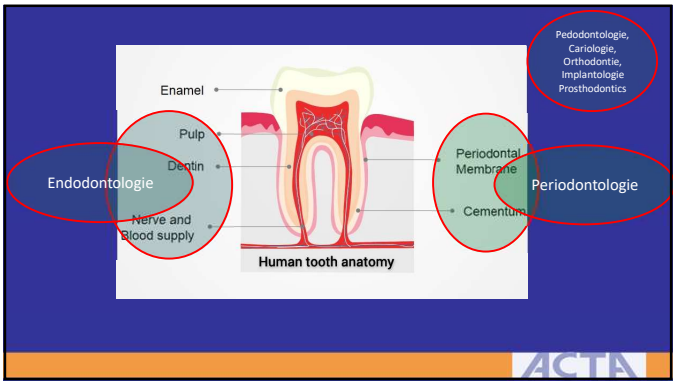
Pedodontologie, Cariologie, Orthodontie, Implantologie Prosthodontics
Enamel
Pulp
Dentin
Nerve and Blood supply
Endodontologie
Periodontal Membrane
Cementum
Periodontologie
Human tooth anatomy
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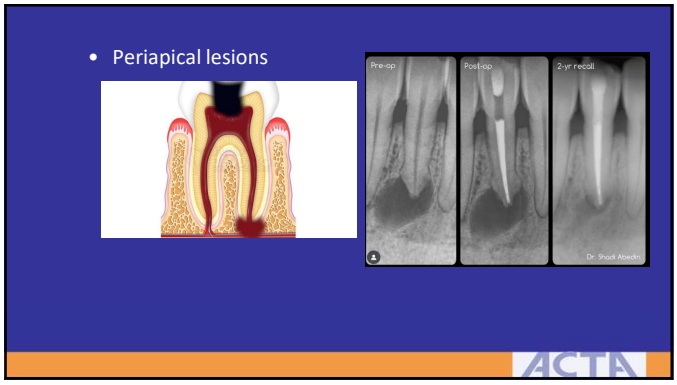
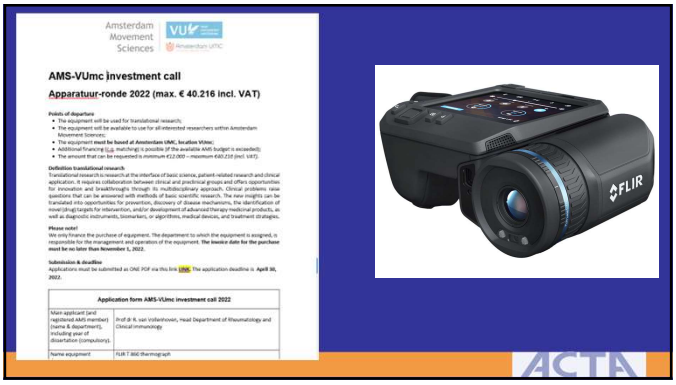

Periapical lesions
Pre-op
Post-op
2-yr recall
Dr. Shadi Abedin
ACTA

5


Amsterdam Movement Sciences
VU
AMS-VUmc investment call
Apparatuur-ronde 2022 (max. € 40.216 incl. VAT)
Application form AMS-VUmc investment call 2022
FLIR
ACTA

6

Publicaties

- Thermography as a non-ionizing quantitative tool for diagnosing periapical inflammatory lesions. Aboushady MA, Talaat W, Hamdoon Z, M Elshazly T, Ragy N, Bourauel C, Talaat S. BMC Oral Health. 2021 May 13;21(1):
- Is Thermal Imaging a Helpful Tool in Diagnosis of Asymptomatic Odontogenic Infection Foci-A Pilot Study. Wziątek-Kuczmik D, Niedzielska I, Mrowiec A, Bałamut K, Handzel M, Szurko A. Int J Environ Res Public Health. 2022 Dec 6;19(23):16325.
- Registration of thermal images of dead teeth to identify odontogenic infection foci. Wziątek-Kuczmik D, Mrowiec A, Niedzielska I, Stanek A, Cholewka A.
- Sci Rep. 2024 Sep 13;14(1):21405.

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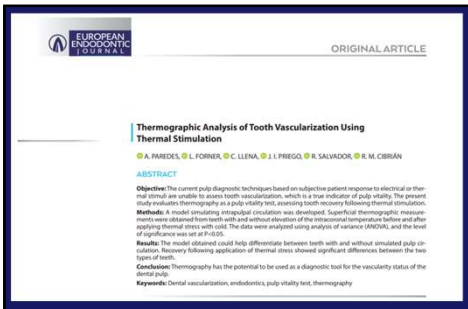
Thermography mogelijke endodontische toepassingen

- Detecteren van parodontitis apicalis
- Evaluatie van vitaliteit van elementen na trauma
- Snelle assessment van genezing na een behandeling (wortelkanaalbehandeling)
- Focal infections screening

8


EUROPEAN ENDODONTIC JOURNAL

ORIGINAL ARTICLE

Thermographic Analysis of Tooth Vascularization Using Thermal Stimulation

A. PAREDES, L. FORNER, C. LLENA, J. I. PRIEGO, R. SALVADOR, R. M. CIBRIÁN

ABSTRACT

Objective: The current pulp diagnostic techniques based on subjective patient response to electrical or thermal stimuli are unable to assess tooth vascularization, which is a true indicator of pulp vitality. The present study evaluates thermography as a pulp vitality test, assessing tooth recovery following thermal stimulation.
Methods: A model simulating intrapulpal circulation was developed. Superficial thermographic measurements were obtained from teeth with and without elevation of the intracoronal temperature before and after applying thermal stress with cold. The data were analyzed using analysis of variance (ANOVA), and the level of significance was set at P<0.05.
Results: The model obtained could help differentiate between teeth with and without simulated pulp circulation. Recovery following application of thermal stress showed significant differences between the two types of teeth.
Conclusion: Thermography has the potential to be used as a diagnostic tool for the vascularity status of the dental pulp.
Keywords: Dental vascularization, endodontics, pulp vitality test, thermography

thermographic camera FLIR E60, FLIR, Wilsonville, USA).

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Project

Protocol naar ETC ACTA – goedkeuring ETC gekregen

Opstelling kliniek

Pilot patiënt

Patiënten checken

10



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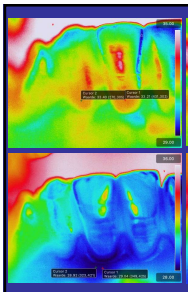
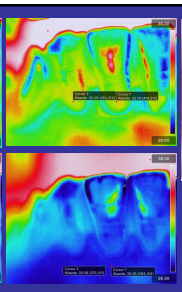


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Uitdagingen bij thermografie in endodontische diagnostiek

1. Opstelling : Afstand tot de patiënt: invloed op meetnauwkeurigheid, Uniformiteit van belichting en positionering
2. Omgevingscondities: Temperatuur van de kamer, Beschikbaarheid, gecontroleerde ruimte
3. Interpretatie en validatie: Variatie tussen operators, Beperkte referentiedata klinische validatie
4. Technische beperkingen: Resolutie en gevoeligheid van de camera, Kalibratie

13

Extra instellingern:
1. Emissiviteit ingesteld is 0,98 omdat je te maken hebt met mensen
2. kamertemperatuur 20-22 graden
3. luchtvochtigheid 50%
4. lens die gebruikt wordt is 17mm 24 graden

(De camera heeft verschillende lenzen : 10mm 42 graden, 17 mm 24 graden, , 29mm 14 graden en FLIR close-up lens 2x WD 18 mm)

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Wat hebben wij nodig…

1. Hulp bij de opstelling : hebben jullie ervaring mee…?
Advies over optimale positionering en afstand van de patiënt, Ervaring met standaardisatie en uniformiteit van metingen , Inrichting van de ruimte: achtergrond, belichting, stabiliteit

2. Training programma/ camera …?
Tips voor kalibratie, softwaregebruik, Feedback over interpretatie van thermografische beelden

3. Specifieke vragen over de lens en andere zaken…?

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