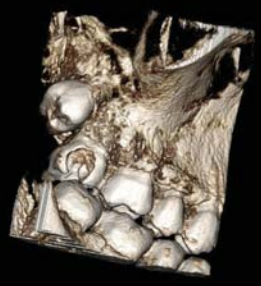
WE HAVE REDISCOVERED
HEALING DENTISTRY

LESS *IS* MORE

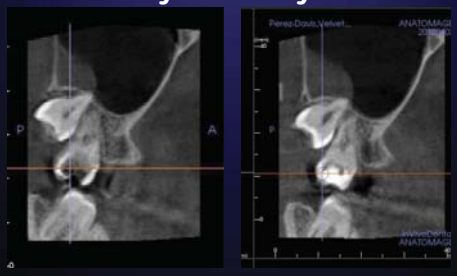
THANK YOU !

WWW.UKDENT.COM

LIMITED TIME SPECIAL OFFER ON NEW HEALOZONE x4



HealOzone / Fuji Triage: 6 months by Prof Ray Bertolotti



NEW TECHNOLOGY:

CAN I AFFORD TO WORK WITHOUT IT?

NEW EQUIPMENT

DECISIONS, DECISIONS

HOW TO MAKE THE RIGHT PURCHASE DECISIONS, FIRST TIME, EVERY TIME, FOR EVERY PRACTICE

ROI

RETURN ON INVESTMENT

NET INCOME (OR BENEFIT) AS A PERCENTAGE OF THE ORIGINAL AMOUNT INVESTED

(USUALLY STATED AS % PER YEAR)

FOR EXAMPLE:
A CERTIFICATE OF DEPOSIT RETURNING $50 ON $1000 INVESTMENT HAS ROI OF 5% PER YEAR

Many Dentists report earning the full cost of the HealOzone within one month

Treatment of all cavity preparations with the HealOzone

Clinical Adhesive Techniques
Less Tooth Destruction

Edward Lynch
MA,BDS,FDSRCSED,FDSLOND,PhD,FADFE

Specialist in Endodontics, Prosthodontics, Restorative Dentistry and BUPA Consultant in Oral Surgery.

Head of Dentistry
University of Warwick, UK

Warwick Dentistry
Advancing Dental Education

Warwick Dentistry
Advancing Dental Education

Warwick Medical School

Warwick Dentistry Location

Located on the border of Coventry and Warwickshire, providing easy access to the major city of Birmingham and the beautiful historic towns of Warwick, Kenilworth, Royal Leamington Spa
and Stratford upon Avon.

WARWICK

University of Warwick

Warwick Dentistry

University of Warwick

- > 20,000 students
- 4,000 from overseas
- 120 nationalities
- Alumni:125,000 from 171 countries
- 290 hectare campus

University of Warwick

Academic Excellence

Ranked 3rd in the University League Table for 2011

Warwick Dentistry

"To be a leading medical school in the UK, internationally renowned for the high quality and relevance of our education programmes and for the excellence and significance of our research"

CPD - Facts and Figures

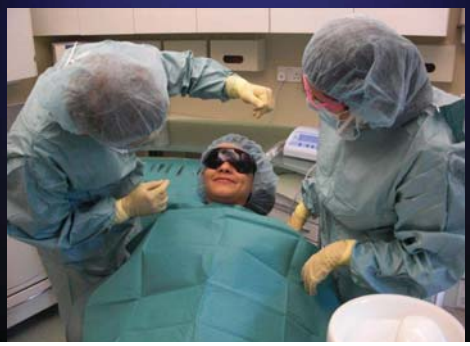
- Serve a very wide range of health professionals
- Largest provider in the UK
- >10,000 people have enrolled on one of our CPD programmes
- 1,000 students currently on postgraduate programmes
- Overall numbers are increasing yearly
- Over 20 masters degrees available
- 100 accredited modules

WARWICK

Warwick Dentistry

- Orthodontics
  Lingual Orthodontics
- Diploma Orthodontic Therapy
- Endodontics
- Prosthodontics
- Periodontology
- Restorative Dentistry
- Oral Surgery
- Implantology
- eMasters in Aesthetic Dentistry Distance Learning
- 3 years full time supervised clinical training

One to one mentoring



University guide 2011: University league table

All UK universities ranked by the Guardian according to teaching excellence

The Guardian University Guide and The Guardian Postgraduate Guide are now available from Guardian Books
• Datablog: download the 2011 tables

guardian.co.uk, Tuesday 8 June 2010 00.03 BST

(2136) Tweet this (221)

University league table

More about the university guide

Go to: Agriculture, forestry and food Go

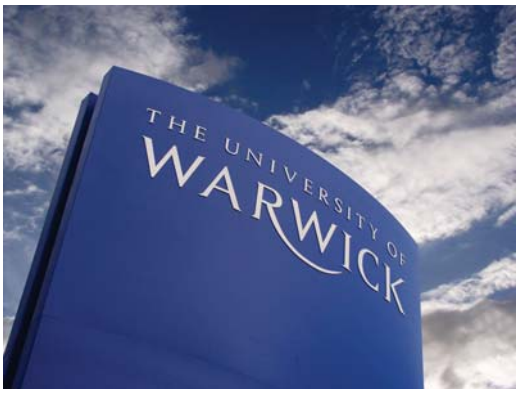
Rating	Name of institution	Guardian score /100	Satisfied overall (%)	Satisfied with teaching (%)	Satisfied with feedback (%)	Student: staff ratio	Spend per student (FTE)	Ave entry tariff	Value added score /10	Job after 6 mths
1 (1)	Oxford	100.0				10.8	10	531	6.9	80
2 (2)	Cambridge	94.5	92	91	72	11.7	9.59	546	5.8	78
3 (4)	Warwick	81.4	88	87	61	13.3	8.39	463	6.2	75
4 (3)	St Andrews	81.3	92	93	70	13.1	6.02	454	6.9	71

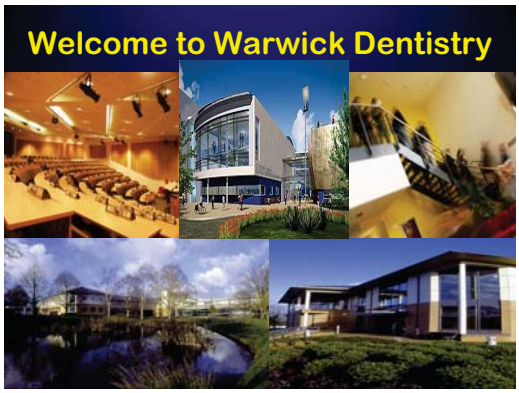
MSc

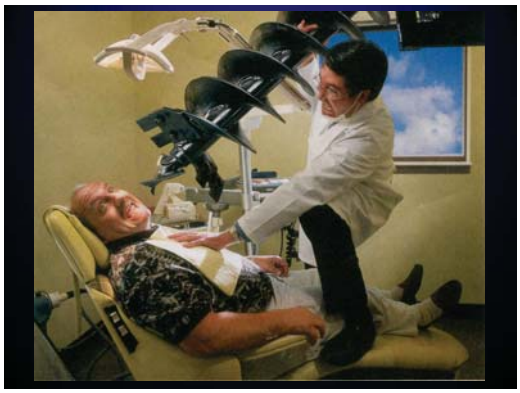
MPhil

PhD by dissertation or

PhD by publications







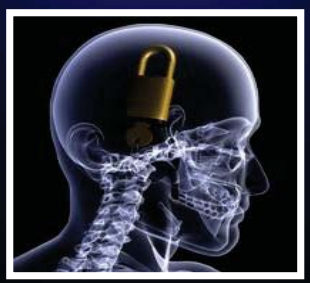
Janina

Toothpaste
Mouthrinse
Spray

From Dental Directory or CTS

Great Oral Health

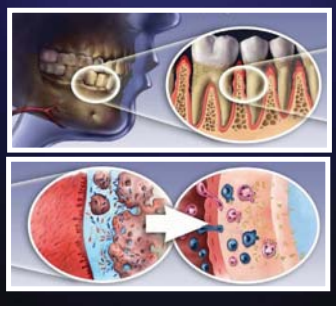
Why look for Gum disease ?



Why look for Gum disease ?

Feb 28th 2009

Perio-systemic link



Periodontal disease is a risk marker for coronary heart disease

Periodontal disease and coronary heart disease incidence: a systematic review and meta-analysis. *J Gen Intern Med2008; 23: 2079-2086*- Humphrey LL, Fu R, Buckley DI, Freeman M, Helfand M.

Conclusion:

Periodontal disease is a risk factor or marker for CHD that is independent of traditional CHD risk factors, including socioeconomic status.

Further research is warranted in this important area of public health.

Periodontal treatment could improve glycaemic control in diabetic patients

Efficacy of periodontal treatment on glycaemic control in diabetic patients: a meta-analysis of interventional studies. *Diabetes Metab 2008; 34:497-506*-**Darre L, Vergnes JN, Courdy P, Sixou M.**

Conclusions

The present meta-analysis represents the best information available to date that addresses this issue, and suggests that periodontal treatment could improve glycaemic control.

Celebrity Endorsement!

"Smoking kills……..

If you are killed - you`ve lost a very important part of your life"

Brooke Shields - smoking

•Some examples of minimal invasive dentistry using HealOzone

Can we seal in caries?

No

70% of "sealed in" occlusal caries progressed

ACTA Research, Poorterman et al, Caries Research 2003; 37: 29 – 33.

Weerheijm KL, de Soet JJ, van Amerongen WE, de Graaff J J Dent Child 1992; 27: 417 – 423

Cariogenic microorganisms found despite sealed restoration with soft and moist dentine, ie active caries under the sealed restorations

McDonald SP, Sheiham A.

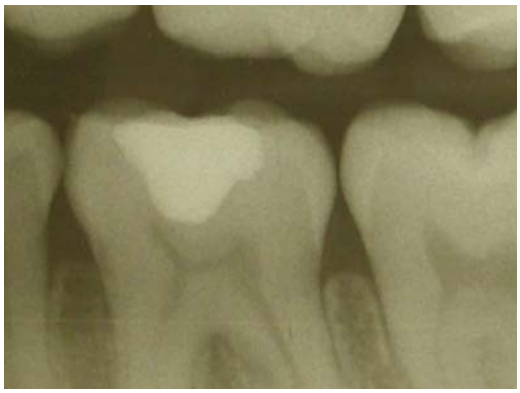
Caries progressed in 5% of the SDF/ SnF_2 group and 11% of the SDF/ SnF_2/ mimimal preparation cavities/ composite resin group in 18 months.

Int Dent J 1994, 44, 465 – 470.

Erin Mahoney and Michael Swain

No remineralisation beneath GIC or GIC/$Ca(OH)_2$ or Composite resin "sealants" after 3-4 months

UMIS and SEM-BSE methodology in Archives of Oral Biology 2004



- Some examples of arrested Root Caries follows using Ozone

Selection of relevant references are in the following slides which have been requested

Almost 100 publications are accessible on
www.iadr.org
and the Pan European IADR and divisional web sites, proving the efficacy of the HealOzone

Am J Dent. 2004 Feb;17(1):56-60.

Effect of ozone on the oral microbiota and clinical severity of primary root caries.

Baysan A, Lynch E

Caries Res. 2000 Nov-Dec;34(6):498-501.

Antimicrobial effect of a novel ozone- generating device on micro-organisms associated with primary root carious lesions in vitro.

Baysan A, Whiley RA, Lynch E

HealOzone

BENEFITS

- CONSERVES TOOTH STRUCTURE
- 1 DAY ENDODONTICS
- CLEANSES PERIO POCKETS EFFECTIVELY with McKenna adaptation
- IMPROVES APICECTOMY SUCCESS
- MORE PREDICATBLE TREATMENT
- FASTER TREATMENT

Benefits for the general dentist

- **Effective**: at least 99.99% of all oral bacteria (incl. Enterococcus Faecalis) are being killed.
- **Fast Treatment.**
- **Easy**: Integrable in existing treatment procedure with no need for special measures.
- **Safe, with no side-effects**: Ozone does not affect the healthy surrounding tissue. No known side-effects

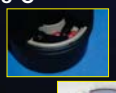
Benefits for the patients

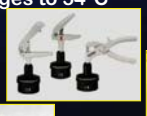
- Painless
- Root canal treatment in a single visit
- Improves implant augmentation success rate
- „Inflammation free“ dental pocket after perio treatment
- Less risk of pulpal exposure in treating deep decay
- Less trauma for children and dental phobics
- Reduces the need for local and systemic antimicrobials

ADDENT AND CALSET

– www.ukdent.com

– Warming units that raise the temperature of composite in compules or syringes to 54°C or 68°C





Application:

- Thermal Assisted Light Polymerization

Features:

- Heats composite material to 98°F (37°C), 130°F (54°C) or 155°F (68°C)
- Maintains constant temperature
- Increases degree of cure

Benefits:

- Shortens curing time by over 80%
- Improves composite flow by 68%
- Reduces Microleakage
- Improves physical properties

Sylc™

Therapeutic Cleaning & Polishing, Desensitization and Regenerative Treatment

Sylc is an innovative new calcium phosphosilicate prophy powder that provides three clinical benefits in one treatment:

- Cleans & Polishes
- Desensitizes Immediately
- Rebuilds Enamel

Full Strength

Sylc™ Product Configurations

Sylc Bottles

Sylc Disposable Delivery System

Sylc Stick Unit Dose/Sample Packs

Sylc™ cleans faster and better than Sodium Bicarbonate

Look at the superior results with Sylc In ***just 20 seconds***

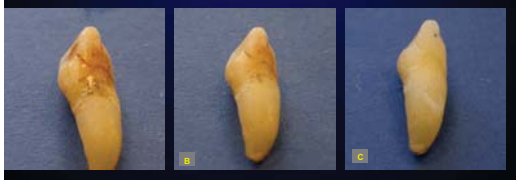
Sylc Powder		Sodium Bicarbonate	
Pre Cleaning	20 seconds	Pre Cleaning	20 seconds

Sylc clearly out-cleans traditional air polishing powder

Clinical Benefits

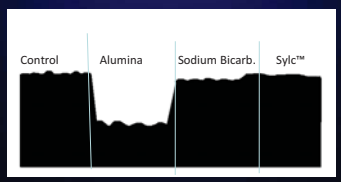
- Stain Removal
- Surface Finish
- Desensitisation
- Remineralisation

Stain Removal



Extracted Tooth | Sodium Bicarbonate | Sylc powder

Effect on Tooth Surface



Material (10 Second Focused Use)	Surface Reduction (Microns)	Surface Roughness (Microns)
Control	0	+/- 1.3
Alumina	250-300	+/- 1.5
Sodium Bicarbonate	10-30	+/- 1.6
Sylc Powder	10-30	+/- 0.84

if you are going to

watch something

you have to be very sure of what you are watching

Hidden Caries

The CarieScan PRO

How the PRO works

- The product platform is based on the application of a technique called ac impedance spectroscopy (ACIST).
- The measurement relies on the application of small electrical signals through the tooth while monitoring the response to the sensor.
- Analysis of the impedance response relates to the physical structure of the tooth

World Beating Accuracy

- 94.8% accurate at detecting caries
- Fewer than 7% false positives and 7 times less than our nearest competitor
- Increase your and your patients confidence that the correct diagnosis has been made

Simple to use…..

- Simply air dry the tooth as you would for a visual examination
- Place the sensor on the tooth/site
- A measurement will be displayed immediately
- To take another reading simply place the sensor on another tooth/site
- No calibration required

….and understand

- The PRO has a simple 0 -100 scale
- 0-50 - Low probability of caries
- 51-90 - Medium probability of caries
- 91-99 - High probability of caries
- 100 - Operative Care Advised
- Quantifiable and repeatable output allows for on-going patient monitoring and an increase in repeat preventative treatments

Increase Practice Revenues

- Locate more decay
- Identify decay earlier

} More preventive and restorative work

- Reduces the need for X-rays allowing an increase in the frequency of monitoring
- Preparation work can be passed to Hygienists saving time and money

Clinicians Report

- 'Easiest and fastest to use'
- 'Performed better than all previous products in rigorous trials'
- The only product to be marked as 'excellent' in any categories (2)

Performance Comparison

-Diagnostic Accuracy of an Optimised AC Impedance Device to Aid Caries Detection and Monitoring, N.B. Pitts, C. Longbottom, A.F. Hall, A. Czajczynska-Waszkiewicz, P. Los, M. Masalski, P. Biecek and A.M. Christie; *Caries Research*; 42:185-238 (2008)
-Systematic reviews of selected dental caries diagnostic and management methods, JD Bader, DA Shugars, AJ Bonito; *J Dental Education*; 65; 960-968 (2001).
-A systematic review of the performance of a laser fluorescence device for detecting caries, JD Bader, DA Shugars; *J Am Dent Assoc*; 135; 1413-1426 (2004).

Using the CarieScan PRO

Testimonials

'What sets the CarieScan PRO apart from other units is its improved sensitivity and specificity with an unmatched accuracy. This high degree of accuracy means fewer false positives, giving me more confidence in my diagnosis'

Dr MICHAEL MIYASAKI, DDS (Sacramento, CA, USA)

"I can confidently tell you that among the 11 devices we have in our caries detection clinic, CarieScan is the most reliable and accurate device for detection and monitoring of initial caries lesion on all surfaces'."

PROF BENNETT T AMAECHI BDS, MS (SATX, USA)

Testimonials

'I use a Cariescan PRO daily. I have found it to be an invaluable device. The PRO has been 100% reliable for the detection of early carious lesions and is now routinely used in place of radiographs'

IAN ROBERTSON BDS (UK)

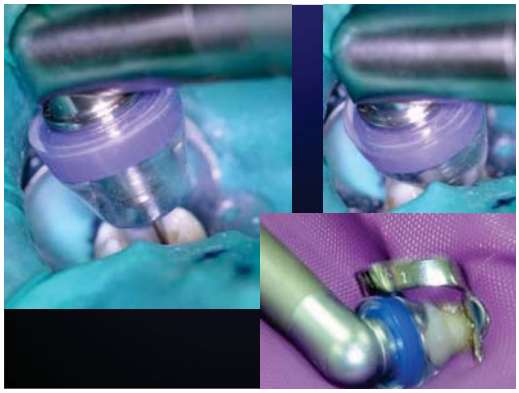
'It is so simple, patients have responded well to it and it has increased visits to the dentists in the practice'

MHARI COXON, RDH (UK)

Edward Lynch

Evidence-based efficacy of ozone for root canal irrigation.

J Esthet Restor Dent. Oct; 2008;20(5):287-293.



Efficacy of ozone on survival and permeability of oral microorganisms

Nagayoshi M, Fukuizumi T, Kitamura C, Yano J, Terashita M, Nishihara T.

Oral Microbiology and Immunology Volume 19 Page 240-246 - 2004.

Antimicrobial Effect of Ozone on Bacteria Invading Dentinal Tubules

Nagayoshi M., Kitamura C., Fukuizumi T., Nishihara T., Terashita M.

Journal of Endodontics, Vol. 30, No.11, 2004, 778-781.

Mechanism of Action

J Dent Res. 2002 Jun;81(6):422-7.

1H and (13)C NMR spectroscopic analysis of human saliva.

Silwood CJ Lynch E Claxson AW Grootveld MC.

J Biol Inorg Chem. 2002 Jan;7(1-2):46-57.

1H NMR investigations of the molecular nature of low-molecular-mass calcium ions in biofluids.

Silwood CL, Grootveld M, Lynch E.

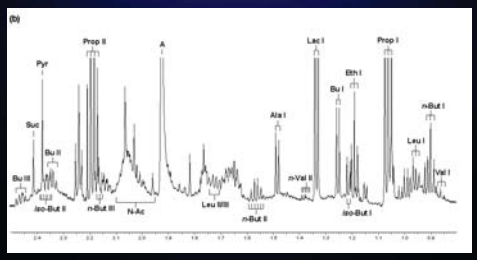
Molecular mechanisms

Silwood C.J.L., Lynch E., Seddon S., Sheerin A., Claxson A.W.D. And Grootveld M. (1999)

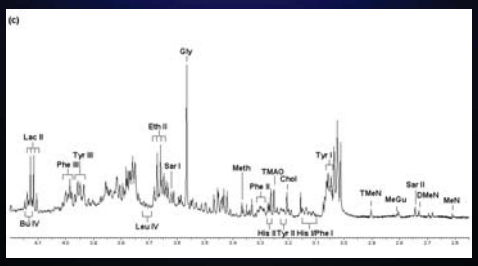
^{1}H NMR Analysis of Microbial-Derived Organic Acids in Primary Root Carious Lesions and Saliva.

NMR in Biomedicine 12: 345-356.

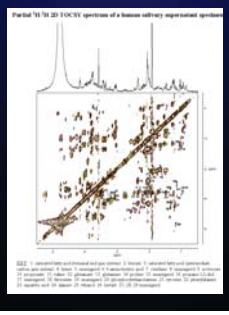
^{1}H NMR spectra



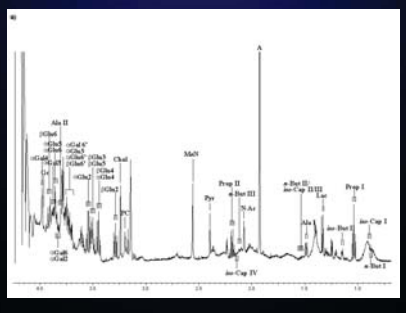
^{1}H NMR spectra



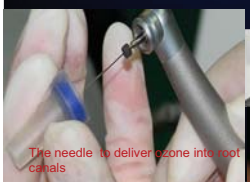
^{1}H NMR spectra



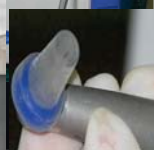
^{1}H NMR spectra of root caries



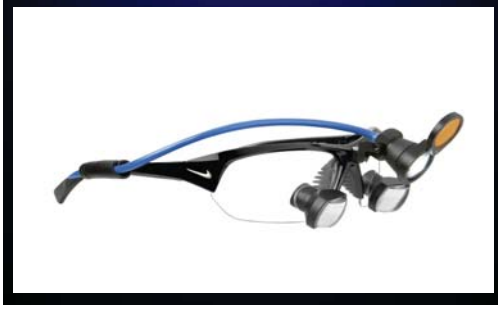
HealOzone (CurOzone Geramany)



The needle to deliver ozone into root canals



HealOzone handpiece from CurOzone Germany used to deliver Ozone gas into root canals



Ozone therapy efficiency for the treatment of periodontal disease

Păduraru A, Lăcătuşu S, Vataman R.

Rev Med Chir Soc Med Nat Iasi. 2010 Jul-Sep;114(3):880-4

The use of ozone and 0.2% chlorhexidine in the treatment of periodontitis patients: A clinical and microbiologic study

Kshitish D, Laxman VK. Indian J Dent Res. 2010 Jul-Sep;21(3):341-8.

Effect of ozone on periodontopathogenic species

S Eick, M Tigan, and A Sculean

IADR SAN DIEGO MARCH 2011, PAPER 3070

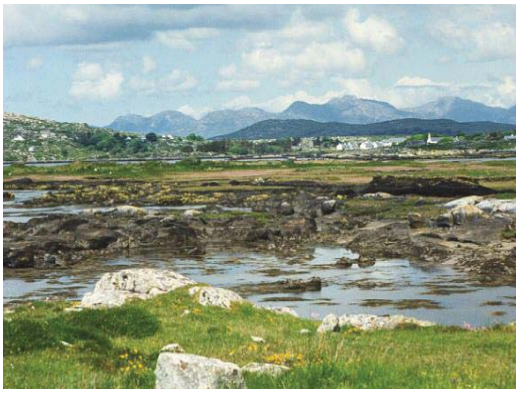
Results showed a high efficacy of ozone against Fusobacterium nucleatum, Porphyromonas gingivalis and Aggregatibacter actinomycetemcomitans.

Most of the strains in a concentration of 10^5 were completely eliminated after two-fold 18 s application of ozone

Effectiveness of ozone against periodontal pathogenic microorganisms

Huth et al, in press 2012

Compared to CHX 0.2%, aqueous ozone 20 µg/ml and gaseous ozone down to 4 g/m3 showed a significantly higher effectiveness.



Is Ozone useful for Peri-implantitis management or prevention?

- Dr Dan Mc Kenna
- Proven successful prevention of Peri-implant mucositis using Ozone
- Awarded First Prize IADR 2009
- MPhil Thesis 2010

Peri-implant mucositis is a significant clinical problem.

Huth et al (J Dent Res. 2007;86 (5):451-456) reported potential benefits of using Ozone in periodontal treatment.

As ozone is the most powerful antimicrobial agent we could use in dentistry it seemed appropriate to assess if Ozone could prevent peri-implant mucositis (McKenna et al PEF 2008).

The aim of this study was to assess if metrology could quantify experimentally produced peri-implant mucositis with and without HealOzone treatment.

The Local Research Ethics Committee (LREC) granted ethical approval and informed consent was also given by all patients after reading the study information sheet.

Methods:

Twenty subjects were enrolled in a randomized, double – blind, controlled, single center study after a pre-trial phase to achieve clinically healthy gingivae

All subjects at the end of the pre-trial phase were asked to refrain from tooth brushing that area by wearing a gum shield over the chosen implants whilst tooth brushing.

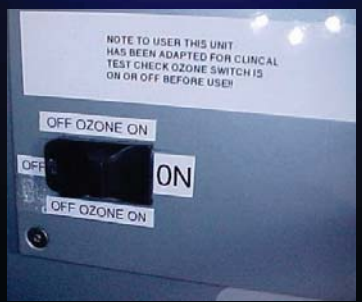
Each of these patients had two implants which were randomly allocated as either test or control.

Subgingival administration of ozone (HealOzone, KaVo) and saline (test implant site) or air and saline (control implant site) was delivered subgingivally for 60 seconds on day 0, 7 and 14.

Plaque, bleeding and modified gingival indices and impressions were recorded by a single operator at 0 and 21 days in this 21 day experimentally induced peri-implant mucositis study

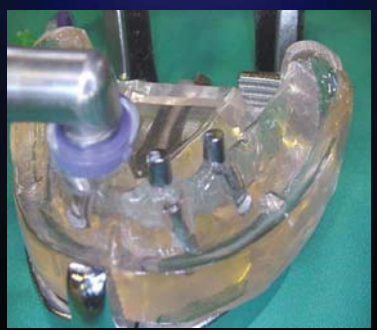
The patients and dentist (investigator) were unaware of the treatments applied to each implant site

Special additional switch to deliver air instead of ozone (Rear view)



HealOzone handpiece adapted by Mc Kenna to treat subgingivally with HealOzone silicone cup and cannula

Mode of HealOzone handpiece cap applications



Paper point to judge depth of gingival crevice

Silicone cup and cannulae applied to implant site

HealOzone handpiece with plastic cannulae

Stacking of silicone cups

Day 0

Day 7

Day 14

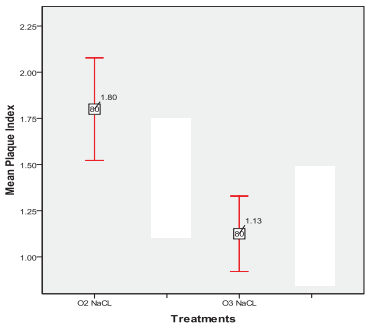
Day 21

Willytec D-Pro laser scanner

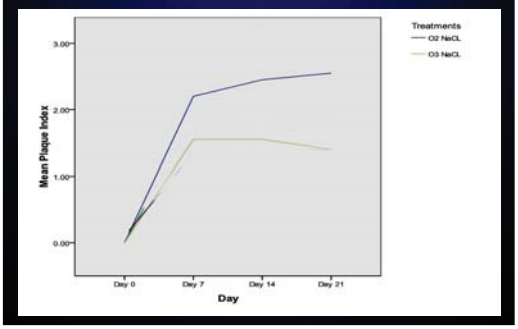
3D Scanning software showing cross-sectional slice of stone model

Results: There were significant differences in plaque (p-value <0.01), gingival (p-value = 0.011) and bleeding (p-value <0.01) index scores between the treatments with ozone and saline showing the optimal tissue health scores.

Plot of the mean plaque index for each treatment



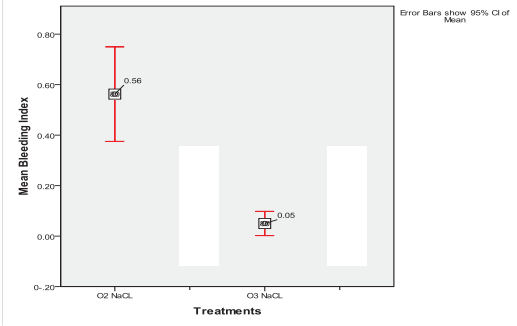
Plot of the mean plaque index score grouped by days



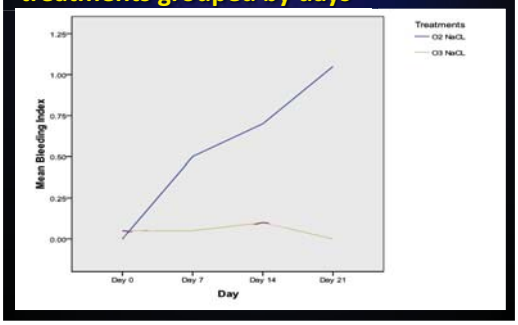
Considering the plaque index outcome, significant differences were observed between the treatments with a p-value < 0.01. The lowest mean plaque index score was recorded by O3 NaCl (1.13; 95% CI: 0.91 to 1.22) whilst O2 NaCL (1.80; 95% CI 1.64 to 1.96) recorded the highest score.

The plaque index at 21 days was less for the ozone treated sites than for the air treated sites (p<0.01) and the changes in plaque and gingival thickness as quantified by the laser scanned impressions correlated with this result (p<0.01).

Plot of the mean bleeding index for each treatment

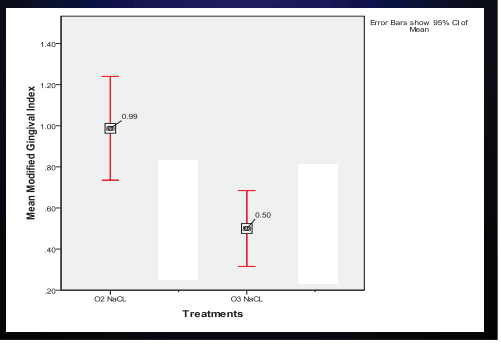


Plot of mean bleeding index score for the treatments grouped by days

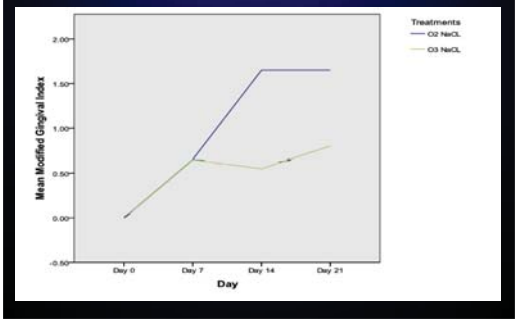


The bleeding index at 21 days was less for the ozone treated sites than for the air treated sites ($p<0.01$) and the change in the gingival volume from the laser scanned impressions correlated with this result.

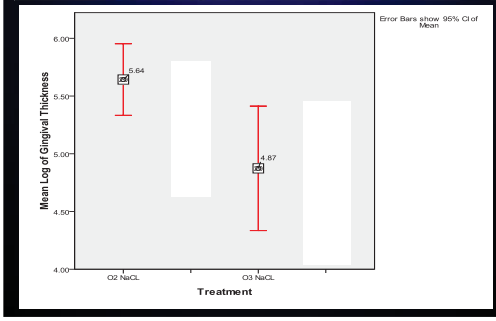
Plot of the mean modified gingival index for each treatment



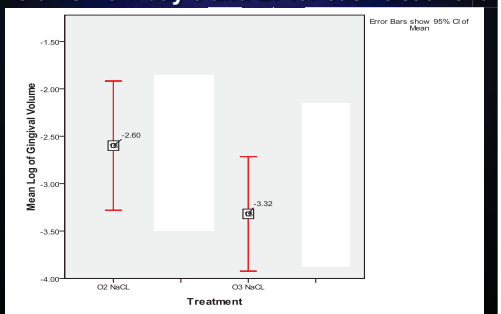
Plot of the mean gingival index scores by days



Plots of mean change in the log of gingival thickness from day 0 and 21 for each treatment



Plots of mean change in the log of gingival volume from day 0 and 21 for each treatment



Conclusion: Metrology could quantify experimentally produced peri-implant mucositis and was able to quantify the significant reduction in peri-implant mucositis associated with the HealOzone treatment.

- Wounds receive more Oxygen when Ozone is applied.
- Enhances the phagocitary activity defending cells
- Accelerates migration of epithelial cells
- Activates Fibroblasts
- Increases collagen synthesis
- Improves cell proliferation
- Increases chemotaxis of monocytes and fibroblasts
- Increases synthesis of extracellular matrix
- Professor Bocci / Professor Filippi

Can HealOzone whiten teeth?

J Ir Dent Assoc. 1994;40(3):78-82.
Safety aspects concerning the therapeutic and cosmetic applications of hydrogen peroxide (H2O2)--containing gels, whiteners, oral rinses and dentifrices.
Lynch E, et al

J Esthet Dent. 1991 Sep-Oct;3(5):162-8.
Is home tooth bleaching gel cytotoxic?
Tse CS, Lynch E, Blake DR, Williams DM.

Clin Oral Investig. 2010 Feb;14(1):1-10.
Undesirable and adverse effects of tooth-whitening products: a review.

Goldberg M, Grootveld M, Lynch E.

Genotoxicity and carcinogenicity only occur at concentrations that are never reached during dental treatments.

Mechanism of Action

J Ir Dent Assoc. 1995;41(4):94-102.

Molecular mechanisms of the bleaching actions associated with commercially-available whitening oral health care products.

Lynch E, et al.

Mechanism of Bleaching

Oxidation

Especially from free radical generation with superoxide (O·) radicals and hydroxyl radicals (OH·)

J Dent Res. 2002 Jun;81(6):422-7.
1H and (13)C NMR spectroscopic analysis of human saliva.
Silwood CJ Lynch E Claxson AW Grootveld MC

J Biol Inorg Chem. 2002 Jan;7(1-2):46-57.
1H NMR investigations of the molecular nature of low-molecular-mass calcium ions in biofluids.

Silwood CL, Grootveld M, Lynch E.

Molecular mechanisms

Silwood C.J.L., Lynch E., Seddon S., Sheerin A., Claxson A.W.D. And Grootveld M. (1999)

^{1}H NMR Analysis of Microbial-Derived Organic Acids in Primary Root Carious Lesions and Saliva.

NMR in Biomedicine 12: 345-356.

Activators

Oper Dent. 2011 Mar-Apr;36(2):162-8.
The influence of chemical activation on tooth bleaching using 10% carbamide peroxide.
Batista GR, Barcellos DC, Torres CR, Goto EH, Pucci CR, Borges AB.

- Adding 0.01% manganese gluconate to 10% carbamide peroxide bleaching gel increased the degree of tooth bleaching after a seven-day treatment and did not influence the resulting shade after 14 days.


Dental Materials Journal 2011; 30(5): 723-729

Effect of light units on tooth bleaching with visible-light activating titanium dioxide photocatalyst

Ayaka KISHI[1], Masayuki OTSUKI[1], Alireza SADR[2], Masaomi IKEDA[3] and Junji TAGAMI[1,2]

This study evaluated the influence of different light sources on the efficiency of an office bleaching agent containing visible-light activating titanium dioxide photocatalyst (VL-TiO2).

Dental Materials Journal 2011; 30(5): 723–729
Effect of light units on tooth bleaching with visible-light activating titanium dioxide photocatalyst
Ayaka KISHI et al

The blue and violet LED light curing was more effective than blue LED light curing and conventional halogen lamp for tooth bleaching with an office bleaching agent containing visible-light activating titanium dioxide photocatalyst (VL-TiO2)

Chlorine dioxide

Lynch E. *et al.* (1997)

Multicomponent spectroscopic investigations of salivary antioxidant consumption by an oral preparation containing the stable free radical species chlorine dioxide ($ClO_2^{\bullet}$).

Free Radical Research 26:209-237.

Peroxoborate

Lynch E . *et al.* (1999)

Multicomponent evaluations of the oxidising actions and status of a peroxoborate-containing tooth-whitening system in whole human saliva using high resolution proton NMR spectroscopy.

Journal of Inorganic Biochemistry 73: 65-84.

Surgery Bleaching

Ozone activates hydrogen peroxide

Can HealOzone whiten teeth?

Ozonated gel and Composite restorations

SCIENTIFIC ARTICLE

Australian Dental Journal 2010; 55: 390–396

doi: 10.1111/j.1834-7819.2010.01259.x

Effect of bleaching versus repolishing on colour and surface topography of stained resin composite

M Abd Elhamid,* R Mosallam†

*El Seka El Hadid Hospital, Cairo, Egypt.
†Department of Operative Dentistry, Faculty of Oral and Dental Medicine, Cairo University, Egypt.

Ozonated gel and Composite Restorations

"Superior whitening effect was demonstrated with the ozonated gel. Ozonated gel showed statistically significant lowest roughness compared to both carbamide peroxide and polishing paste."

Ozonated gel and composite restorations

Table 4. Difference between the three whitening methods regarding surface roughness

Whitening method (I)	Whitening method (J)	Mean difference (I-J)	P
Carbamide peroxide	Polishing paste	−0.800	0.208
	Ozonated gel	*1.600	0.003*
Polishing paste	Carbamide peroxide	0.800	0.208
	Ozonated gel	*2.400	0.000*
Ozonated gel	Carbamide peroxide	*−1.600	0.003*
	Polishing paste	*−2.400	0.000*

*Significant at P ≤ 0.05.

"Ozone is an efficient bleaching agent with the least adverse effect on surface roughness."

Ozone and effluent biodegradability

Advanced oxidation of bleached eucalypt kraft pulp mill effluent

A.H. Mounteer, R.O. Pereira, A.A. Morais, D.B. Ruas, D.S.A. Silveira, D.B. Viana and R.C. Medeiros
Civil Engineering Department, Federal University of Viçosa, 36570-000 Viçosa, MG, Brazil (Email: ann@ufv.br)

The O3/H2O2 process increased effluent biodegradability by up to 68%. Increasing the O3 dose had a greater effect on biodegradability improvement and lignin and colour removal efficiencies than increasing the H2O2 dose.

Available online at www.sciencedirect.com
ScienceDirect
BIORESOURCE TECHNOLOGY
ELSEVIER

Arundo donax L. reed: New perspectives for pulping and bleaching. 5. Ozone-based TCF bleaching of organosolv pulps

A.A. Shatalov *, H. Pereira

The pulps can be bleached to brightness values of 80–83% ISO by a short ozone-based TCF bleaching sequence.

Available at www.sciencedirect.com
SCIENCE DIRECT
WATER RESEARCH
ELSEVIER

UV-based processes for reactive azo dye mineralization

Igor Peternel, Natalija Koprivanac*, Hrvoje Kusic
Faculty of Chemical Engineering and Technology, University of Zagreb, Marulićev trg 19, Zagreb 10000, Croatia

"In the present study, advanced oxidation processes, UV/H2O2, UV/O3, and UV/H2O2/O3 have been applied to bleach and degrade an organic dye. UV/H2O2/O3 process was the most efficient."

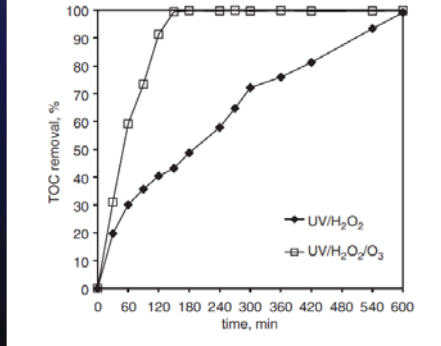


Fig. 9 – Comparison of time required for complete

Available online at www.sciencedirect.com
SCIENCE DIRECT
BIORESOURCE TECHNOLOGY
ELSEVIER

Dechlorination and decolorization of chloro-organics in pulp bleach plant E-1 effluents by advanced oxidation processes

Rui Wang a,b, Chen-Loung Chen a,*, Josef S. Gratzl a

Introduction of ozone stream into the UV-photolysis system result in appreciable improvement in both decolorization and dechlorination.

Available online at www.sciencedirect.com
SCIENCE DIRECT
BIORESOURCE TECHNOLOGY
ELSEVIER

Optimization of hydrogen peroxide in totally chlorine free bleaching of cellulose pulp from olive tree residues

F. López a,*, M.J. Díaz a, M.E. Eugenio a, J. Ariza a, A. Rodríguez b, L. Jiménez b

Considerable improvements were obtained with respect to other bleaching sequences such as ozone. Hydrogen peroxide bleaching decreased the kappa index 51.3% less than ozone bleaching.

Bleaching; Ozone and hydrogen peroxide combinations

Effect of ozone, chlorine and hydrogen peroxide on the elimination of colour in treated textile wastewater by MBR.

Water Sci Technol 2004;49(4):299-303

Brik M; Chamam B; Schoberl P; Braun R; Fuchs W

Effect of oxygen, ozone and hydrogen peroxide bleaching stages on the contents and composition of extractives of Eucalyptus globulus kraft pulps.

Bioresour Technol 2006 Feb;97(3):420-8

Freire CS; Silvestre AJ; Pascoal Neto C; Evtuguin DV

Dechlorination of chlorophenols found in pulp bleach plant E-1 effluents by advanced oxidation processes.

Bioresour Technol 2005 May;96(8):897-906

Wang R; Chen CL; Gratzl JS

Rate of dibutylsulfide decomposition by ozonation and the O3/H2O2 advanced oxidation process.

J Hazard Mater 2009 May 30;164(2-3):1364-71

Popiel S; Nalepa T; Dzierzak D; Stankiewicz R; Witkiewicz Z

Dehalogenation, degradation and mineralization of diuron by peroxone (peroxide/ozone) treatment.

J Environ Sci Health A Tox Hazard Subst Environ Eng 44;6(630-8 S1093-4529

Catalkaya EC; Kargi F

Kinetics study on photochemical oxidation of polyacrylamide by ozone combined with hydrogen peroxide and ultraviolet radiation.

J Environ Sci (China)

2006;18(4):660-4

Ren GM; Sun DZ; Chung JS

Elimination of Listeria monocytogenes biofilms by ozone, chlorine, and hydrogen peroxide.

J Food Prot 2005 Mar;68(3):494-8

Robbins JB; Fisher CW; Moltz AG; Martin SE

An ozone/hydrogen peroxide/microwave-enhanced advanced oxidation process for sewage sludge treatment.

J Environ Sci Health A Tox Hazard Subst Environ Eng 42;8(1177-81 S1093-4529

Yin G; Liao PH; Lo KV

.

Oxidative degradation of N-nitrosodimethylamine by conventional ozonation and the advanced oxidation process ozone/hydrogen peroxide.

Water Res 2007 Feb;41(3):581-90

Lee C; Yoon J; Von Gunten U

.

Treatment of volatile organic chemicals on the EPA Contaminant Candidate List using ozonation and the O3/H2O2 advanced oxidation process.
Environ Sci Technol 2006 Apr 15;40(8):2734-9

Chen WR; Sharpless CM; Linden KG; Suffet IH

Grootveld M, Silwood C, Lynch E.

Biofactors 2006; 27: 5 – 18.

Oxidative Consumption of Biomolecules by Ozone; Clinical Relevence.

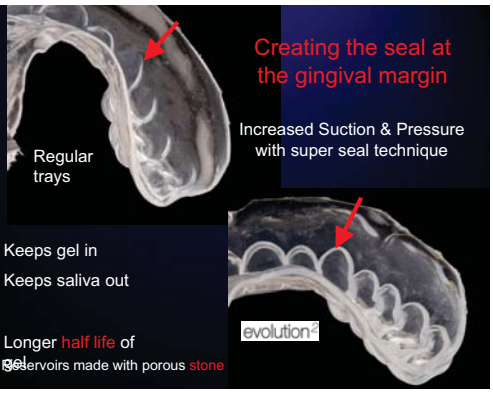
J Ir Dent Assoc. 1996;42(3):74-6.

Professional bleaching of teeth in dental practice techniques.

Samarawickrama DY, Lynch E, et al

Surgery Bleaching

Ozone activates hydrogen peroxide



•Perfect Trays

Zero Sensitivity Perfect Tray

(Inventor, Dr. Wyman Chan, UK Patent No. **2 416 310, 2 445 298**)

- Non-Reservoir (CRA 1997 Gordon Christensen)
- Non-Scalloped, extend 2-3 mm over gingival margins, preventing saliva entering the tray to dilute the gel (Haywood 2002)

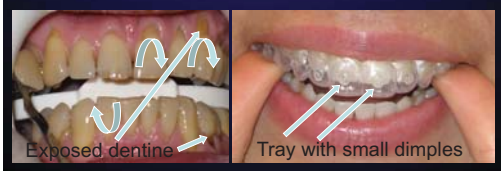
Perfect Seals, like post dams, on the inside labial preventing the gingival crevicular fluid (GCF) and saliva contaminating and consuming the bleaching agent and also sealing the gel within the tray

Loading the Perfect Tray by filling up the dimples on the labial side

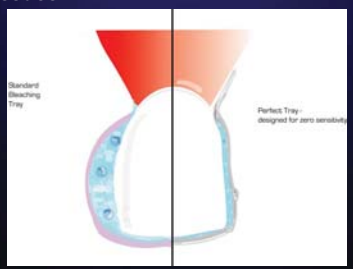
- The dimples serve two purposes:
  1) The location marks and
  2) the amount of bleaching gel to be loaded inside the tray
- Only a small amount of gel is required

Bleaching gel is prevented from getting in contact with exposed dentine and oral soft tissues by the Perfect Seals

- Bleach only enamel and gel is locked in by the Perfect seal (enamel is the only non-vital tissue in our body when fully matured)
- Oxidants (gas) are pushed back into the enamel pores enhancing the bleaching effect



- Minimal amount of gel needed
- 75mg (6%) per upper application (502mg)
- Zero sensitivity on teeth and oral soft tissues.



Smile Studio Perfect Tray HB

- Carbamide Peroxide (CP) 10%-16% - Overnight wear
- CP 18% - 1-2 hours twice a day or overnight
- H_2O_2 (HP) - ½ hour twice a day
- 2 to 6 weeks
- Lower wear time if experience sensitivity


Before
10 applications


Before
After

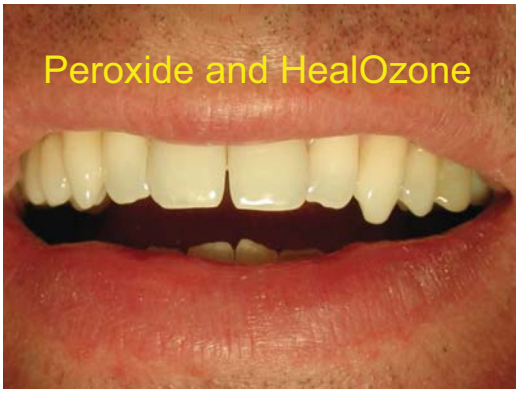

No impressions
No trays
No sensitivity
No paint-on dam
get2smile!
get2smile! WOW!

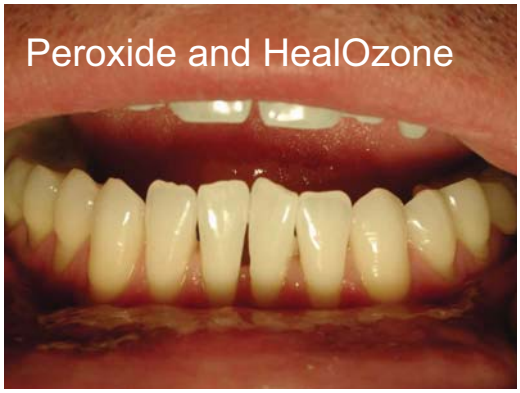

New paint-on system with get2smile Thermal Diffuser
Gentle raised temperature of bleaching gel at gel/enamel interface
Enhancing diffusion of gel inside enamel
wy10 10% H_2O_2


Before (fluorosis stains)
10 applications


Before
10 apps


Before
10 applications





Professor Lawrence Walsh, Dean, Brisbane, Australia.

Also proved the efficacy of the HealOzone to activate peroxide

Internal bleaching

HealOzone and the walking bleach technique

Access and Seal over GP

37% Phosphoric Acid Etch

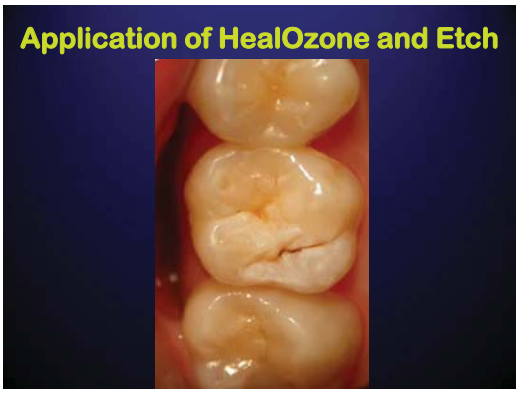
Paste of Sodium Perborate Powder and H_2O_2

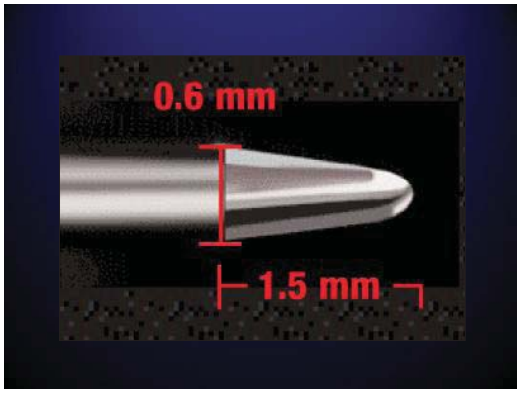
HealOzone 30 seconds

Seal with GIC 1 wk

Biocompatible


Diagnodent reading 35

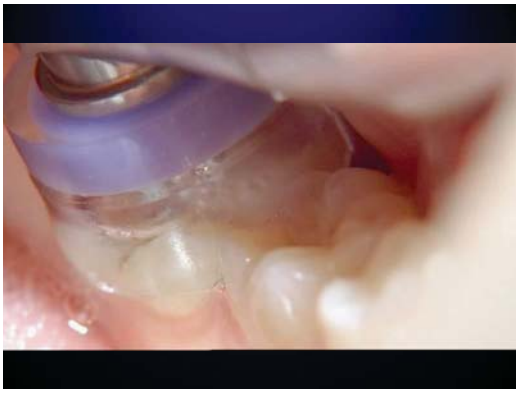

Application of HealOzone and Etch



- healOzone X4
- Curozone

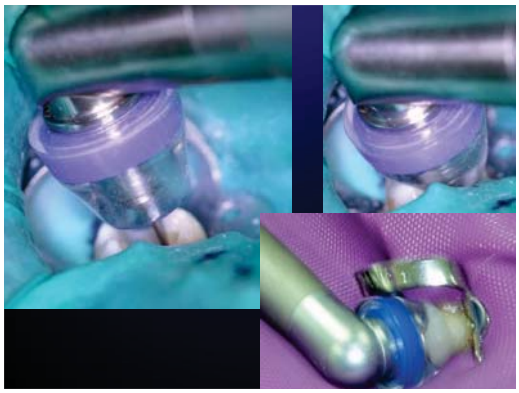
- www.ukdent.com
- E.lynch@warwick.ac.uk

HealOzone handpiece from CurOzone Germany



HealOzone (CurOzone Germany) 2,350 ppm ozone, 615 cc /min flow rate X4 = 9400 ppm Ozone

HealOzone handpiece from CurOzone Germany used to deliver Ozone gas into root canals



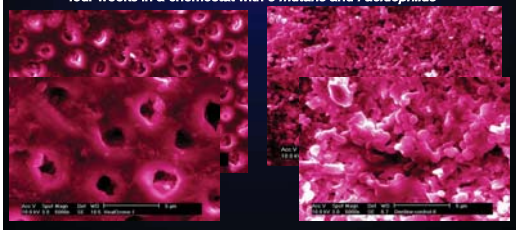
WWW.UKDENT.COM

LIMITED TIME SPECIAL OFFER ON NEW HEALOZONE x4

Treatment of dentine with HealOzone

HealOzone **control**

four weeks in a chemostat with *s mutans* and *l acidophilus*



Knight GM et al. , Aust Dent J 2008;53:349-353.

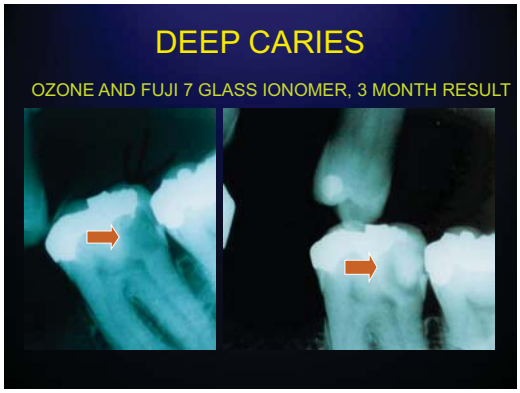
Ozone (O_3) treatment of caries:

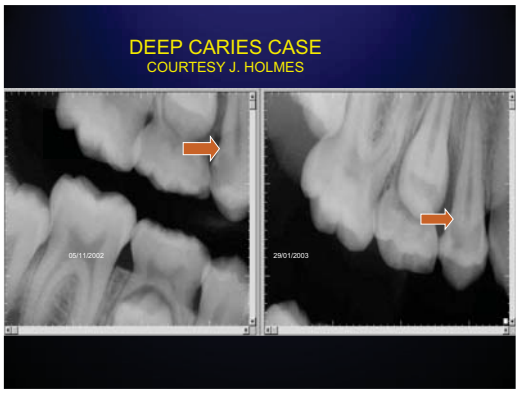
- The "ecological niche" of acidogenic and aciduric microorganisms is eliminated, for at least 14 weeks
- Remineralization overpowers demineralization
- Rapid remineralization occurs

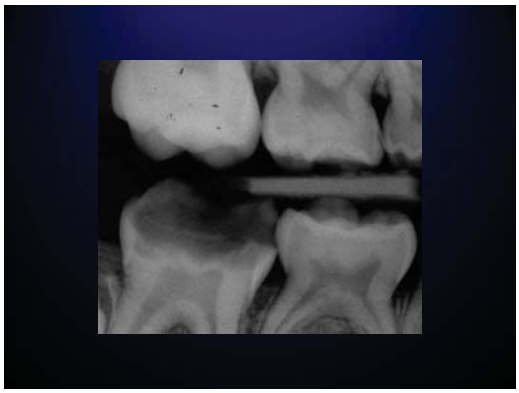
- **Some examples of radiograhic changes in Ozone treated caries follows**

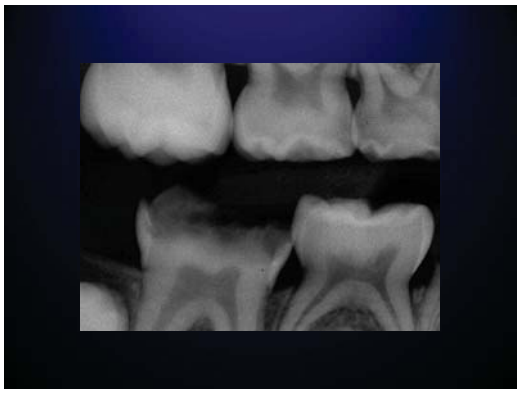

3 months later
05/11/2002
29/01/2003
Photo Courtesy of Dr Julian Holmes


Ozone and 3 months.
Dipak Joshi

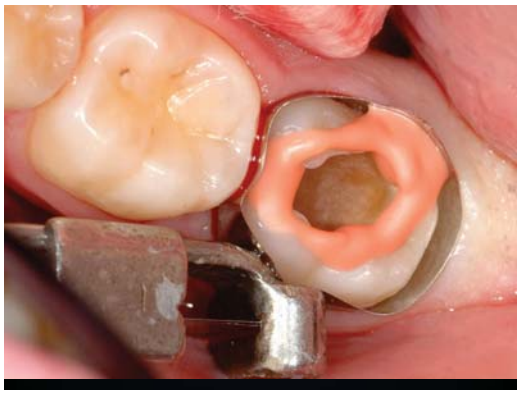

DEEP CARIES
OZONE AND FUJI 7 GLASS IONOMER, 3 MONTH RESULT

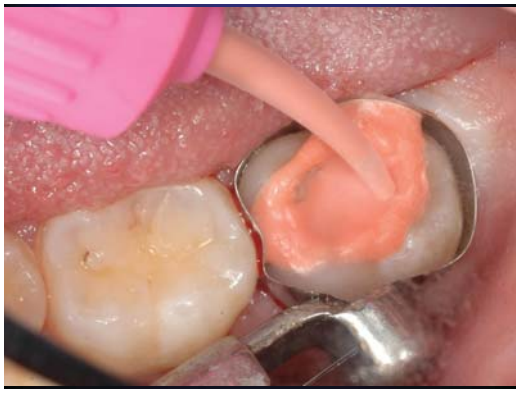

DEEP CARIES CASE
COURTESY J. HOLMES
05/11/2002
29/01/2003






Ref: Geoff Knight

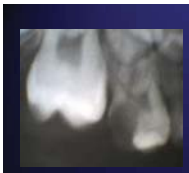


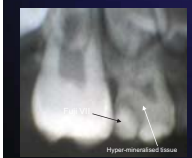


"I have included a sequence of X-rays I did on one of these patients."

X-ray 1: Child patient aged 4 years. Presents with rampant bottle decay on all teeth. No pain or infection present. Suggested GA with pulpotomy to try to save 55 to allow 16 to erupt into favourable position. Parents refused general anesthesia.

X-ray 2: Child presents 6 months later. Again, no pain or infection. Parents do not want GA. Child uncooperative but allowed ART technique with Fuji IX.





X-ray 3: Child returned over one year later as an emergency with toothache. ART technique had failed on 55. Child still unable to have conventional dentistry performed in the chair. Parents still unwilling to accept GA. Ozone from the Healozone and Fuji VII was used.

X-ray 4: Child came for a "check-up" just over 1 year later. Miraculous! No pain or infection. The 16 has erupted perfectly into position.

My question here is: how is the tooth "healing"?
Please can you explain the mechanism by which this hyper-mineralised tissue is formed?

Huth K, Paschos E, Brand and Hickel R.
Effect of Healozone on non cavitated fissure carious lesions in permanent molars. A controlled prospective study.

American Journal of Dentistry 2005; 18: 223 – 270.

Most Dentists charge the same fee for Ozone treatment and sealing (flowable composite) of an occlusal caries lesion as they do for a posterior composite.
This saves the Dentist time

Reversal of deciduous caries after HealOzone treatment

Dahrhardt J, Jaeggi T, Lussi A.
Treating open carious lesions in anxious children with ozone. A prospective controlled clinical study.
American Journal of Dentistry 2006; 19: 267 – 270.

Reversal of Deciduous Caries using HealOzone

M Phil Thesis, UK
2004

OT.Abu-Salem

HealOzone uses with Caries

Professor Sebastian Ciancio, USA
Biological Therapies in Dentistry 2005
"Studies with over 2000 Patients have shown remineralisation of Healozone treated permanent and deciduous occlusal surfaces as well as root caries".
"The HealOzone is a novel new and painless way to treat early caries".

- Amna Al Shamsi
- PhD thesis 2007
- HealOzone significantly reduces caries incidence around orthodontic brackets (9% versus 28%)

Dahrhardt J, Jaeggi T, Lussi A.
Treating open carious lesions in anxious children with Healozone. A prospective controlled clinical study.
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Effect of Healozone treatment on different cariogenic microorganisms in vitro.

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Fagrell TG; Dietz W; Lingstrom P; Steiniger F; Noren JG

The Use of Ozone in Dentistry and Medicine.
Part 1.

Baysan A and Lynch E.

Primary Dental Care, 12; 2: April 2005, 47 – 52.

- **The use of Ozone in Dentistry and Medicine.**
- **Part 2.**
- **Baysan and Lynch**
- **Primary Dental Care 2006; 13: 37 – 41**

Anti-microbial effects of a novel ozone generating device on micro-organisms associated with root carious lesions

A. Baysan, R. Whiley and E. Lynch Caries Research 2000;34:498-501.

99% microbial killing achieved after ozone treatment

HealOzone treatment for deep caries or as an alternative to stepwise excavation

Studies in London and Isle of Wight

Reversal of root caries using HealOzone
- A 12 month longitudinal study

A. Baysan (London)

PhD Thesis University of London 2003

Am J Dent 2004; 17: 54 – 60.

- **Baysan A and Lynch E.**
- **91% Reversal of Caries at 5.5 months after Healozone treatment.**
- **99% Reduction in Microorganisms at 5.5 months.**

- **The Root Caries deeper then 2mms did not reverse.**

Gerodontology 2003; 20: 106 – 114.

Clinical reversal of root caries using Healozone, double blind, randomised, controlled 18-month trial.

- **Julian Holmes**
- **100% Reversal of Non Cavitated Root Caries at 18 months**

Antibacterial effect of Healozone on cariogenic bacterial species.

J Dent. 2009 Jun;37(6):449-53

Johansson E, Claesson R, van Dijken JW

The influence of Healozone on microleakage and fissure penetration of different sealing materials.

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Dukić W, Dukić OL, Milardović S.

Ozone improves lipopolysaccharide-induced responses of an odontoblast-like cell line.

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Noguchi F, Kitamura C, Nagayoshi M, Chen KK, Terashita M, Nishihara T.

The inability of Streptococcus mutans and Lactobacillus acidophilus to form a biofilm in vitro on dentine pretreated with Healozone.

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Dähnhardt JE, Gygax M, Martignoni B, Suter P, Lussi A.

Skaug N, Strand G, Nielsen O

ORCA & Caries Research 2006

85% Reduction in Mutans Streptococci with HealOzone and 78.6% Reduction in Lactobacilli

Khairul Matin, Junji Tagami

99% Microbial killing with HealOzone

Dept of Restorative Sciences and Cariology Tokyo Medical and Dental University

Professor Michael Noack and Suzanne Kneist

ORCA & Caries Research 2006

99% reduction in microorganisms following 20 seconds of HealOzone treatment

HealOzone treatment for deep caries or as an alternative to stepwise excavation

Studies in London and Isle of Wight

Are Ozone systems safe?

Ozone air levels from a dental ozone gas delivery system

Johansson E, Andersson-Wenckert I, Hagenbjork-Gustafsson A, van Dijken JWV

Acta Odontol Scand. 2007 Nov;65(6):324-330

Conclusion

HealOzone is safe

Assessment of the safety of two ozone delivery devices

Millar BJ, Hodson N.

J Dent. 2007 Mar;35(3):195-200

Conclusion

HealOzone is safe and the Ozone system which blows out Ozone is not safe

J Dent Res 86 (5): 451–456, 2007 Huth KC et al. Effect of Aqueous Ozone on the NF-kB System

Ozone exerts inhibitory effects on the NF-kB system suggesting it has an anti-inflammatory capacity.
IkBa proteolysis, cytokine expression and kB-dependent transcription were prevented.

Huth et al.

Effect of ozone on oral cells compared to established antimicrobials.

Eur J Oral Sci 2006; 114: 435 – 440.

Filippi A

The effects of ozone on epithelial wound healing.

Dtsch Zahnarztl Z 2001; 56: 104 – 108.

Research Awards to Ozone researchers

- Dr Dan Mc Kenna
- Proven successful prevention of Peri-implantitis using HealOzone
- Awarded First Prize IADR 2009 (International Association for Dental Research annual meeting)

- Dr Jameela Alawadi
- Proven successful use of HealOzone in root canal therapy
- Awarded First Prize IADR 2008

- Professor Martin Grootveld
- Proven successful management of Dental Unit Water Lines using Ozone
- Awarded First Prize IADR 2007

- Professor Dr Liviu Steier
- Proven successful use of HealOzone and sealing to manage caries
- Awarded First Prize IADR 2006

- Dr Wyman Chan
- Awarded First Prize IADR for his HealOzone research 2005

- Dr Julian Holmes
- Awarded First Prize IADR for his HealOzone research 2004

- Dr Aylin Baysan
- Awarded two First Prizes at IADR

- Dr Layla Abu-Naba'a
- Awarded the prestigious Basil Bibby cariology award at IADR partly for her HealOzone research 2001

- Helene Domingo
- Awarded First Prize IADR for HealOzone research

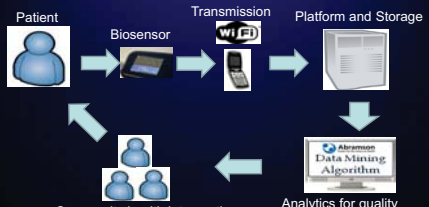
- Amna Al Shamsi
- PhD thesis 2007
- HealOzone significantly reduces caries incidence around orthodontic brackets (9% versus 28%)

- Ozone therapy in the treatment of avascular bisphosphonate – related jaw osteonecrosis
- Agrillo et al. J Craniofac Surg 2007; 18: 1071 – 1075
- Ozone increased the complete healing of lesions with the disappearance of symptoms and brings lesion progression down to zero. Ozone's "benefits were remarkable"

Objective Quantitative Use of Saliva to Reflect Health or Disease

E Lynch
IADR Symposium 2009

The Blue Scale System



Highlights of the Blue Scale System

1. Low cost implementation
2. Early intervention
3. Technologically innovative
4. Job creation

Future products in the pipeline

Disease	Device	Stage	Funding
Congestive Heart Failure	Blue Scale	Clinical trial complete	
Aortic Aneurysm	Blue Box + Sphygmomanometer	Design completed	DeBakey Center
Asthma	Single Breath Spiromter + mobile phone+video game + social network	Under construction	Challenge Grant (applying)
Diabetes/Metabolic Syndrome	Tunable laser spectrometer & hand held breath detector	Basic science development	Methodist
HIV/AIDS	Medication dispenser/mobile phone/social network	Planned/awaiting funding	BILL & MELINDA GATES foundation (applied)
Buruli Ulcer	Mobile phone camera	Software testing	

ADVANTAGES OF SALIVA AS BIOFLUID MEDIUM FOR DIAGNOSTIC PURPOSES

- Ease of Collection
- Low cost of Collection
- Non-invasive Collection for Patients (reduces *Anxiety* and *Stress*)
- Facilitates Collection of Multiple Samples for Time-Dependent Monitoring Purposes
- Easy to Handle and Deal with

Markers for pregnancy-related disorders, such fetal aneuploidy, preterm birth, preeclampsia, intra-amniotic infection and fetal stress.

MANY OTHER DIAGNOSTIC ANALYTES ('BIOMARKERS') HAVE BEEN SHOWN TO BE PRESENT IN HUMAN SALIVA

For example:

- Steroid Hormones
- HIV Antibody
- Those for Hepatitis A, B and C

Unique diagnostic panels of salivary mRNAs in subjects with Sjögren's disease.

Four salivary mRNAs (OAZ, SAT, IL8, and IL1b) collectively have a discriminatory power of 91% sensitivity and specificity for oral cancer detection.

Recommended Reading

The Axelsson Series on Preventive Dentistry

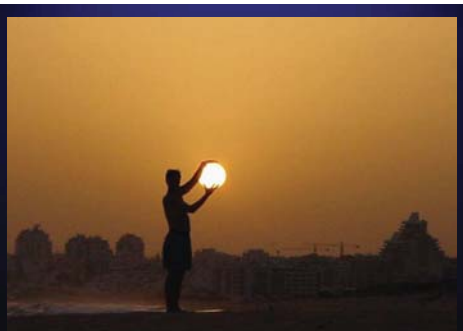
Ozone – the Revolution in Dentistry. Quintessence Dec 2004

New opinions are always suspected, and usually opposed, without any other reason but because they are not already common

John Locke 1690

Thank you for listening

E.LYNCH@WARWICK.AC.UK



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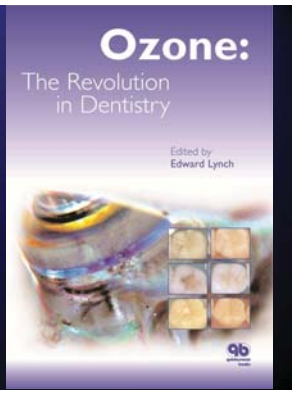

Warwick Dentistry
Advancing Dental Education

Warwick Medical School

E.LYNCH@WARWICK.AC.UK

THE UNIVERSITY OF WARWICK

- Effect of Ozone on Dental Caries Progression
- Seghi et al
- AADR Dallas April 2008
- Ozone significantly (P=0.003) reduced caries progression in experimental rats

- Oxidation of Biomolecules by Ozone
- E Lynch et al
- AADR Dallas April 2008
- Oxidation of Cysteine and Methionine proving Ozone (TherOzone) can combat oral malodour

- Bleaching of compounds responsible for Tooth Discoloration by Ozone
- H Domingo et al
- AADR Dallas 2008
- Ozonated water (TherOzone) bleaches

Han S. Uhm, Kwang H. Lee, and Baik L. Seong.

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HealOzone is safe

Ozi-cure is not safe

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Ozonated water improves lipopolysaccharide-induced responses of an odontoblast-like cell line.

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Ozone air levels from a dental ozone gas delivery system

Acta Odontol Scand Nov 2007.

Johansson E, Andersson-Wenckert I, Hagenbjork-Gustafsson A, van Dijken JWV.

HealOzone is safe.

- Wounds receive more Oxygen when Ozonated Water is applied.
- Enhances the phagocitary activity defending cells
- Accelerates migration of epithelial cells
- Activates Fibroblasts
- Increases collagen synthesis
- Improves cell proliferation
- Increases chemotaxis of monocytes and fibroblasts
- Increases synthesis of extracellular matrix
- Professor Bocci / Professor Filippi

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- Scientific and medical aspects of Ozone therapy. State of the art.
- Professor Velio Bocci
- Arch Med Res 2006; 37: 425 – 435.
- Beneficial effects of Ozone discussed

- Ozone accelerates wound healing
- Chronic leg ulcers. Aust Farm Physician 1985; 14: 292 - 298
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- Ozone activates cellular metabolism. Masui 1993; 42: 2 – 6.
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- Ozone increases cytokines relevant to wound healing, especially Transforming Growth Factor. Professor Bocci et al, J Biol Regul Homeost Agents 1994; 8: 108 – 112.

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Aqueous Ozone exerts inhibitory effects on the NF-kB system suggesting it has an anti-inflammatory capacity. IkBa proteolysis, cytokine expression and kB-dependent transcription were prevented.

Evidence-based efficacy of ozone for root canal irrigation.

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J Esthet Restor Dent. 2008;20(5):287-93.

Efficacy of calcium hydroxide, Er:YAG laser or gaseous ozone against Enterococcus faecalis in root canals.

Am J Dent. 2009 Feb;22(1):14-8.

Noetzel J, Nonhoff J, Bitter K, Wagner J, Neumann K, Kielbassa AM

Bactericidal effect of KTP laser irradiation against Enterococcus faecalis compared with gaseous ozone: an ex vivo study.

Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2009 May;107(5):e73-9

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- Jameela Mohammed Alawadi
- PhD thesis 2008
- Successful use of Ozone in root canal therapy
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- Experience in ozone use for root canal therapy
- Berukova et al
- Stomatologia 2005; 84: 20 – 22.
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J Endod 2004; 30: 778 – 781.

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The effects of ozonised water on epithelial wound healing.

Dtsch Zahnarztl Z 2001; 56: 104 – 108.

- The influence of Ozonated Water on the epithelial wound healing process in the oral cavity
- Professor A Filippi
- Use of Ozonater Water clearly showed an acceleration of wound healing within the first 48 hours, resulting in earlier epithelial would closure after 7 days.

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- Braz Dent J. 2006;17(2):134-8.
- Antimicrobial potential of ozone in an ultrasonic cleaning system against Staphylococcus aureus.
- Estrela C, Estrela CR, Decurcio Dde A, Silva JA, Bammann LL

Ozone sterilises 10^6 cfu Enterococcus Faecalis

Chang H

IADR 2003

Professor Beer and Liviu Steier

Witten University

Sterilisation of root canals using HealOzone 2006

Efficacy of Ozone on Survival and Permeability of Oral Microorganisms

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Some published research with the TherOzone

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Effects of sodium hypochlorite and ozone on healing of intestinal anastomosis in simulated strangulation colorectal obstruction.

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Effects of ozone on how well split-thickness skin grafts according to Thiersch take in war wounds. Results of prospective study.

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A physicochemical investigation on the effects of ozone on blood

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(2006) *Archives of Medical Research*, 37 (4), pp. 425-435

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Is it true that ozone is always toxic? The end of a dogma

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Application of medical ozone in endodontic practice

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Reduction by gaseous ozone of Salmonella and microbial flora associated with fresh-cut cantaloupe.

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Bull Exp Biol Med
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Grootveld M, Silwood C, Lynch E.

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- **Azarpazhooh and Limeback, J Dent 2008; 36: 104 – 116**

- **Good evidence of Ozone biocompatibility with human oral epithelial cells, gingival fibroblasts and periodontal cells**
- **Ozone removes micro-organisms from dental unit water lines, the oral cavity and dentures**
- **Good evidence of the prophylactic application of Ozone in Restorative Dentistry**

Use of Ozonated water for avulsed teeth

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PCNA-expression of cementoblasts and fibroblasts on the root surface after extraoral rinsing with ozonized water for decontamination.

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- Skin grafts. Langenbecks Arch Chir 1995; 42: 2 – 6.

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Use of Ozone to treat Dental Unit Water Lines

- Water disinfection of dental treatment units using Ozone
- Professor A Filippi et al
- Dtsch Zahnarztl Z. 1991; 46 (7): 485 – 487.
- Disinfection proven using Ozonated Water

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Professor Sebastian Ciancio, USA
Biological Therapies in Dentistry 2005
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"The HealOzone is a novel new and painless way to treat early caries".

- Amna Al Shamsi
- PhD thesis 2007
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Anti-microbial effects of a novel ozone generating device on micro-organisms associated with root carious lesions

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HealOzone treatment for deep caries or as an alternative to stepwise excavation

Studies in London and Isle of Wight

Reversal of root caries using Ozone - A 12 month longitudinal study

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- **100% Reversal of Non Cavitated Root Caries at 18 months**

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78.6% Reduction in Lactobacilli

Khairul Matin, Junji Tagami

99% Microbial killing with HealOzone

Dept of Restorative Sciences and Cariology
Tokyo Medical and Dental University

Professor Michael Noack and Suzanne Kneist

ORCA & Caries Research 2006

99% reduction in microorganisms following 20 seconds of HealOzone treatment

HealOzone treatment for deep caries or as an alternative to stepwise excavation

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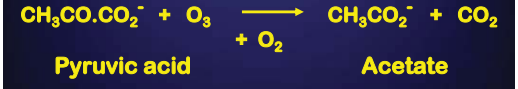

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The measurement of root caries for research purposes

Edward Lynch

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This is the only validated severity index for root caries

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A pharmaceutical approach to the management of root caries

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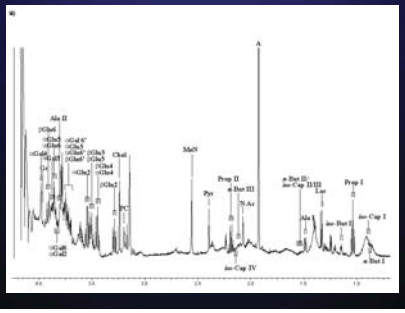
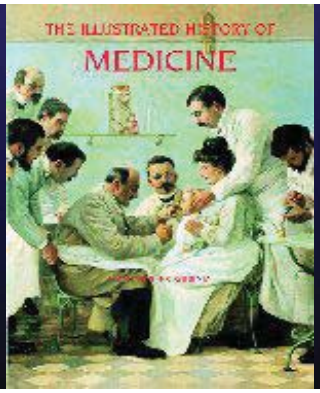


A Pharmaceutical Approach to the Management of Root Caries

Edward Lynch

Professor of Restorative Dentistry and Gerodontology
School of Clinical Dentistry
Queen's University Belfast



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Management of root caries using a dentifrice with a high FLUORIDE content

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Reversal of primary root caries using dentifrices containing 5,000 and 1,100 ppm fluoride - 3 month follow-up

Lynch E, Baysan A, Ellwood R, Davies R, Petersson L, Borsboom P.

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E. Lynch and A. Baysan

Caries Research

QUEEN MARY AND WESTFIELD COLLEGE UNIVERSITY OF LONDON

Root caries remineralisation using 5,000 and 1,100 ppm fluoride dentifrices

A. BAYSAN* and E. LYNCH[1]

The Morita Investigator Award for the Best Clinical Science Presentation from Geriatric Oral Research Group at the International Association of Dental Research in April 2000

Conclusion

The use of dentifrices containing either 5,000 or 1,100 ppm fluoride was associated with the reversal of some of PRCLs.

The use of a dentifrice with a high fluoride content was significantly better to reverse leathery lesions than an 1,100 ppm fluoride dentifrice within 6 months.

QUEEN MARY AND WESTFIELD COLLEGE UNIVERSITY OF LONDON

Treatment of cervical sensitivity with a root sealant

A. BAYSAN[1,2]*, E. LYNCH[1], S. BRAILSFORD[3] and D. BEIGHTON[3]

[1]Restorative Dentistry and Gerodontology, Queen's University Belfast, Northern Ireland, [2]Department of Adult Oral Health, St. Bart's and the Royal London School of Medicine and Dentistry, London, UK, [3]Oral Microbiology, Guy's, King's and St. Thomas Dental Institute, London

Journal of Dental Research 1999;78:2712

Dentine sensitivity is one of the most painful and least predictably treated clinical conditions.

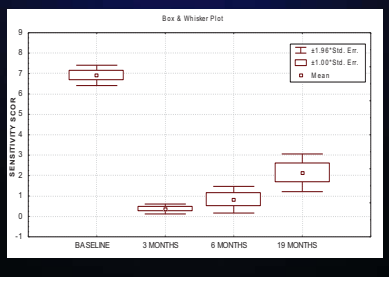
It has been established that dentinal hypersensitivity affects 1 in 6 people. Incidence tends to peak around the third decade of life and is equally divided between men and women.

Aim

The aim of this study was to assess a new protective root sealant for the treatment of cervical sensitivity.

Results

Sensitivity scores at baseline and at time points of 3, 6 and 19 months



Conclusions

There was a significant reduction in sensitivity scores compared to baseline after 19 months.

The protective sealant was found to be capable of covering the cervical surface to prevent further wear.

In addition, there was a significant reduction of some representative caries associated micro-organisms in the overlying plaque.

Understanding the Results (5/7)

LCD: 51 - 90

LED: 3 yellows (optional)

AUDIO: 2 beeps

OBSERVATION:
Probability of significant carious change beneath the enamel surface warranting specific preventive care.

ADVICE: ***Preventive Care Advised (PCA)***
Strongly consider fluoride varnish or (on pit & fissure sites) pit & fissure sealants, with localized oral hygiene, diet advice and personalised review with monitoring at shorter intervals.

Is Ozone useful for Periodontal –Endodontic Lesions?

Cleanability of dental instruments--implications of residual protein and risks from Creutzfeldt-Jakob disease.

Walker JT, Dickinson J, Sutton JM, Raven ND, Marsh PD. Br Dent J. 2007 Oct 13;203(7):395-401.

Is Ozone useful for Periodontal –Endodontic Lesions?

Professional chemical free cleaning

"Cleans better than chemicals; without chemicals"

e-cloth *professional* products utilise the highest quality fibres available today.

They neither contain nor use any chemicals, to remove grease, dirt and bacteria from all hard surfaces, using only water.

User Guide

This information is given as an aid to diagnosis only and the final diagnosis and treatment plan should always be the clinician's decision, also taking into account conventional methods of examination as well as patient risk factors.

Caries Probability		Possible Treatment Options	
	100	100	Likelihood of Established Dentin Caries Subject to patient profile, minimally invasive operative dentistry may be necessary. Any restoration should be as small as possible.
High Probability	H	91-99	Intensive Preventive Care Intensive without a prophylactic measures **including either fluoride varnish or pit & fissure sealants, with or sealant restoration technique.** **Possibility of established decay extending through the enamel and into superficial dentin.**
	90	51-90	Moderate Preventive Care Usual caries prophylactic measures including fluoride varnish or pit & fissure sealants, with localized oral hygiene, diet advice and personalized review with monitoring at shorter intervals. *Increasing values indicate a need for increasing intensity of preventive care.*
Medium Probability	M		
	50	1-50	Mild Preventive Care Usual caries prophylactic measures including localized oral hygiene advice with use of fluoride toothpaste and review with monitoring over time.
Low Probability	L	0	Likelihood of being Sound Continuing surveillance, assessment and review appropriate to the caries risk of the patient.
	0		

CARIESCAN PRO™ EXCEED EXPECTATIONS

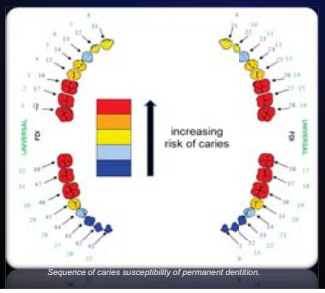
Technical Overview

Contents

- Caries Risk Factors
- The PRO – Overview
- How does it work?
- Product Features
- Benefits to your practice
- Endorsements
- Performance Comparison
- Thank you

High risk teeth

As a general guideline, pits & fissures are more susceptible to caries lesion development than approximal sites, which in turn are more susceptible than free smooth sites.



Sequence of caries susceptibility of permanent dentition.

High risk sites

One or more of these fissure types can occur on the same fissure pattern, so it is vital that the clinician uses their knowledge about these different types and their different susceptibilities when examining a tooth for signs of caries lesions.

Shape of fissure		Prevalence %	Increasing risk of caries
	'Bottle-type'	1	
	'I-type'	46	
	'V-type'	39	
	'U-type'	14	

Fissure types, with their respective prevalences and caries susceptibility.

Most susceptible to caries since its base is inaccessible to toothbrush bristles.

Virtually impossible to clean with a toothbrush, hence is at considerable risk

Narrower than the U-type at its base so presents a slightly more challenging fissure pattern to clean.

Readily cleansable, so plaque can be brushed off before it instigates the caries process

The CarieScan PRO

How the PRO works

A small electrical current is passed through the tooth and the response is measured.

Comparison of the response with the applied signal leads to the impedance.

Impedance is an electrical parameter that is directly influenced by the physical properties of the material being studied.

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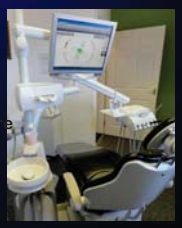
Treatment options

- Dietary Advice
- Oral Hygiene Advice
- Re-mineralising agents
- Great Oral Health products
- Pit & Fissure Sealants
- Topical Fluorides and Varnishes
- Other agents

RemoteView

- Wireless capture of data
- Monitoring feature
- Alternative display option
- Web Update
- Links to existing practice software
- Included in system price



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Advancing Dental Education

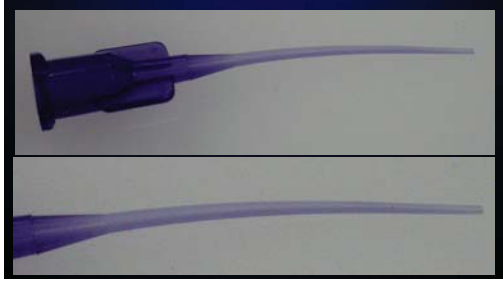
Warwick Medical School

E.LYNCH@WARWICK.AC.UK

THE UNIVERSITY OF WARWICK

Conclusion

HealOzone is safe



HealOzone treatment of all deep caries. Complete remineralisation.

Leathery pre Ozone + GIC

Hard 3 months later