

ozone in routine care

- course summary

- caries diagnosis

- introduction to O₃

- integrating O₃ into routine dental treatment

- future developments & research

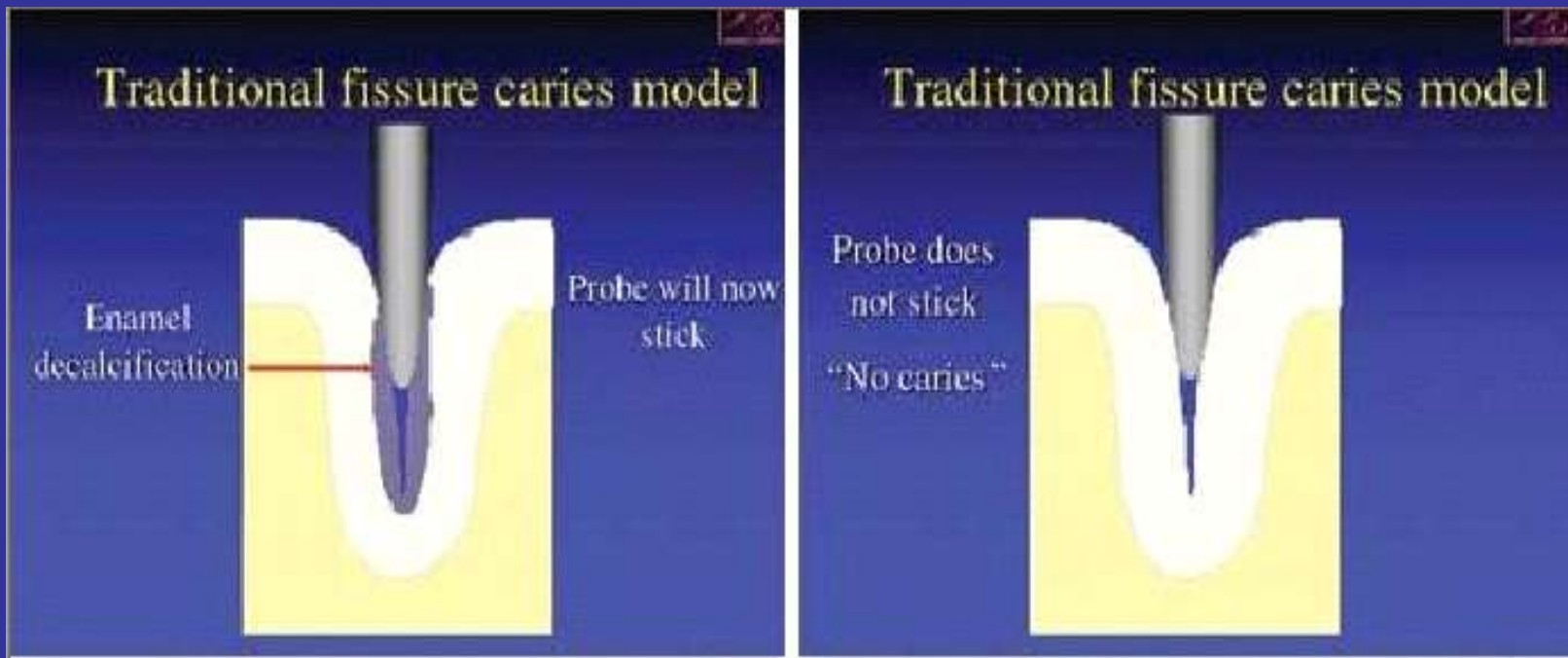
- published research

- special offers from GCE

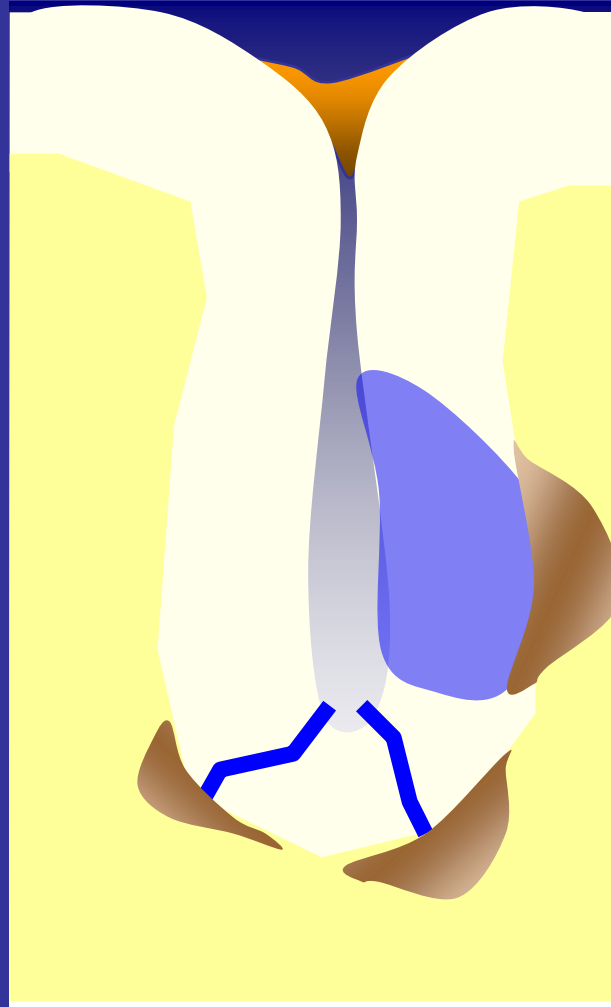
ozone in routine care

- caries diagnosis
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- integrating O₃ into routine dental treatment
- integrating O₃ into advanced dental treatment
- future developments & research

caries diagnosis



caries diagnosis



caries diagnosis



- KaVo DIAGNOdent
- measures fluorescence
- high correlation with the ECM (Lode, Holland)
- validated index traditional model Lussi A, Switzerland
- new DIAGNOdent Pen beware values Krause F, *et al* 2007



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2003

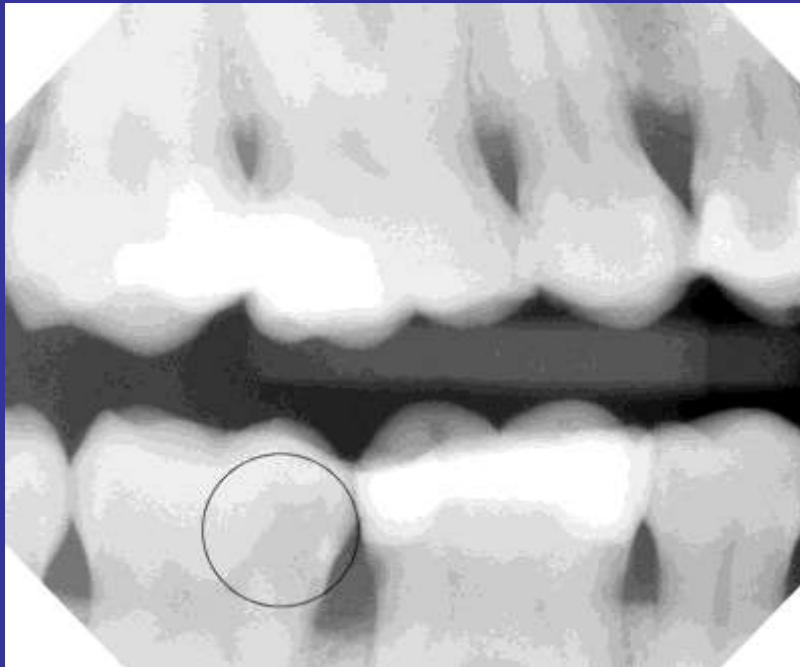
ozone in routine care

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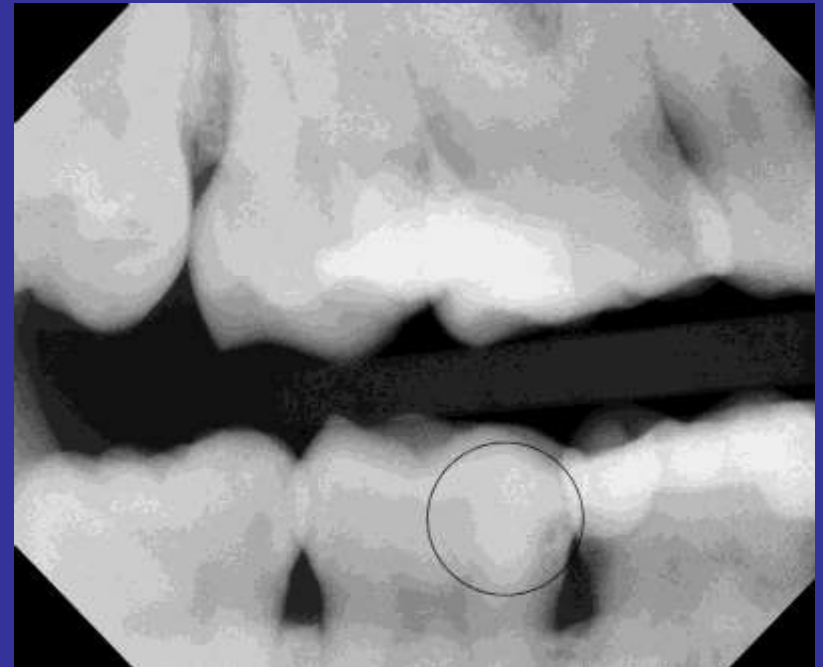
ozone in routine care

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ozone in routine care



Before O3 Tx; 02-02-04



After O3 Tx; 28-09-04

Abigall Summers

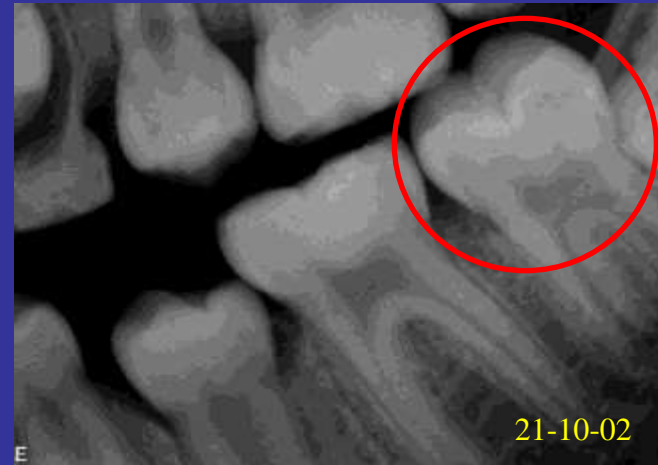
Referring Dentist Oloph Granath, USA

ozone in routine care

O₃ treatment started

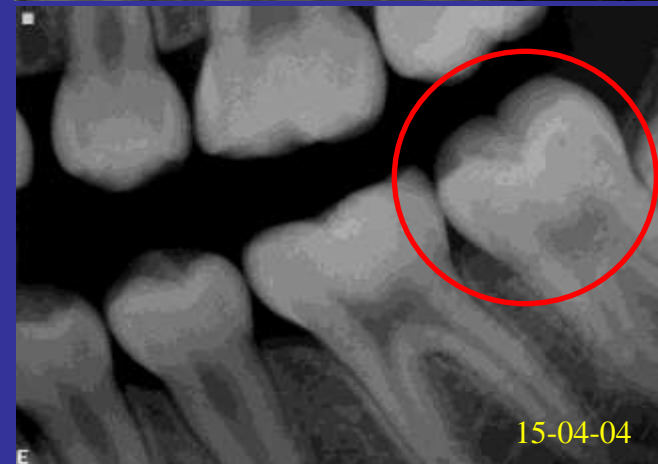
21-10-02.

Before O₃

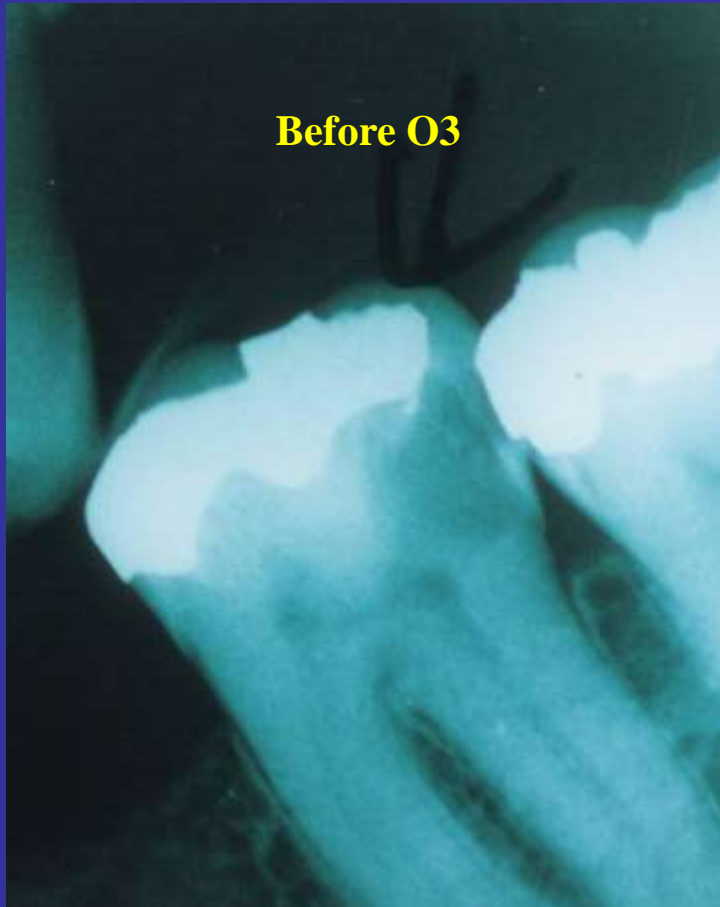


After O₃

**Review 15-04-04, 18-months
after the first application of O₃**



ozone in routine care



ozone in routine care

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- **integrating O₃ into advanced dental treatment**
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ozone in routine care

- caries diagnosis
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- integrating O₃ into advanced dental treatment
- future developments & research

ozone in routine care

delivery systems

full / partial mouth

ozone delivery

fluoride

remineralising solutions

pharmaceutical agents



routine prevention

periodontal control

accelerated whitening



infection control



treatment with encapsulated
ozonated oil-gels;

'V-221'™ (LS-O3)

'V-192'™ (HE-O3)

Capsules



'V-221 RDP'(LS-O3) and 'V-192 RDP'(HE-O3)
treatment with the Viralon Remanolation
Dispensing Pen

research in dental care literature overview:

- to end with -

some papers to think
about as you drift off to
sleep!

research in dental care

literature overview:

- Fitzgerald and Keyes. Demonstration of the etiologic role of streptococci in caries in the hamster. *Journal of the American Dental Association*, 1960; 61. 9-31.
- were the first workers to show that cross infection happens, albeit in animal models.
- Berkowitz RJ Acquisition and transmission of mutans streptococci. *J Calif Dent Assoc.* 2003 Feb;31(2):135-8
- showed that cross infection does occur, so if mums and dads have high bacterial counts, then their infants will acquire them too.
- More of an issue, Berkowitz also showed that horizontal infection also occurs from child to child in day-care centres.
- So if you have a child with no bacterial infection, in a play group with an infant from a high-caries family, your child may pick up that 'infection'.

research in dental care

literature overview:

- Caufield PW. Dental caries: an infectious and transmissible disease, where have we been and where are we going? N Y State Dent J. 2005 Mar;71(2):23-7.
- dental caries is often referred to as an infectious disease
- changes or ecological shifts made in childhood (may) become lifelong.
- ...reduction / elimination of cariogenic bacteria and the colonisation site in the primary dentition may prevent / delay their transfer to the permanent dentition.
- ...reduction in the mother's levels of cariogenic bacteria may delay or interrupt the transfer of cariogenic bacteria to her infant.
- ...caries transmission is vertical through the family and horizontal from child to child, or child to adult to child & so on

research in dental care

literature overview:

- Anderson K. Are sealants doing more than preventing caries? CDS Rev. 2000 Sep;93(6):10-4.
- ...a quiet controversy is mounting about some of the chemicals that may be leaching from these powerhouses of prevention
- ...some scientists hint that sealants may require further study to rule out possible links between some of their components and breast cancer development, prostate enlargement and some as-yet-unknown biological effects
- ... hormone dysregulators - pseudo-estrogens

research in dental care

literature overview:

- Schuurs AH, Moorer WR. Hormone dysregulators. Pseudo-estrogens in dental composite resins and sealants? Ned Tijdschr Tandheelkd. 2000 Dec;107(12):490-4.
- ...polluting chemicals in the ecosystems must be characterized as hormone disruptors.
- ...among others, male animals appear to become feminized by the action of the so-called pseudo-estrogens and under their influence men's' fertility may decrease
- ...long-term-effects and synergism with pseudo-estrogens from other sources prompt further studies in order to verify the safety of the Bis-GMA containing products

research in dental care

literature overview:

- Schuurs AH, Moorer WR. Hormone dysregulators. Pseudo-estrogens in dental composite resins and sealants? *Ned Tijdschr Tandheelkd.* 2000 Dec;107(12):490-4.
- endocrine disruptors found in composite resins
- Ozone treatment of water;
- Deborde M, Rabouan S, Duguet JP, Legube B. Kinetics of aqueous ozone-induced oxidation of some endocrine disruptors, *Environmental Science and Technology* 39 (16) (2005)
- endocrine disruptors were destroyed by ozonated water.
- Broséusa R, Vincenta S, Aboulfadlb K, Daneshvarc A, Sauvéb S, Barbeaua B, Prévosta M. Ozone oxidation of pharmaceuticals, endocrine disruptors and pesticides during drinking water treatment. *Water Research* Volume 43, Issue 18, October 2009
- endocrine disruptors were destroyed by ozonated water.
- Use ozonated water mouth rinse *after* placement of composites or use of rubber dam

research in dental care

literature overview:

- Herle GP, Joseph T, Varma B, Jayanthi M. Comparative evaluation of glass ionomer and resin based fissure sealant using non-invasive and invasive techniques--a SEM and microleakage study. J Indian Soc Pedod Prev Dent. 2004 Jun;22(2):56-62.
- the efficacy of using invasive and non-invasive techniques was assessed by Scanning electron microscopy, and by microleakage
- glass ionomer (GC FujiVII) compared to Resin based sealant (Helioseal-F, Ivoclar Vivadent).
 - Group I: non-invasive technique FujiVII
 - Group II: Invasive FujiVII
 - Group III: Non-Invasive Helioseal-F
 - Group IV: Invasive, Helioseal-F
- SEM evaluation - flow and adaptation of FujiVII better than Helioseal F
- **Group II - invasive technique (air abrasion) provided the best flow and adaptation.**
- In light of controversies using resin based sealants, FujiVII is a viable alternative for pit and fissure sealants.

research in dental care

literature overview:

- Clark D. Do traditional sealants have a place in the new, super-magnified world? Dent Today. 2004 Sep;23(9):92, 94-9.
- ...(sealants placed by) an entry-level auxiliary could prevent occlusal caries by painting over the grooves of the teeth
- ...(*diagnosis ed JH*) of occlusal caries is significantly more complex and technically challenging than originally thought
- ...changing the process from a lower-skill, auxiliary-driven procedure to a high-skill, magnified / microscope-centred procedure will require a shift in scheduling and value systems
- ...investment in auxiliary's equipment is required

research in dental care

literature overview:

- Folke BD, Walton JL, Feigal RJ. Occlusal sealant success over ten years in a private practice: comparing longevity of sealants placed by dentists, hygienists, and assistants. *Pediatr Dent.* 2004 Sep-Oct;26(5):426-32.
- ...dentists and registered dental assistants showed 3 times and 2 times the risk of failure, respectively, compared to the registered dental hygienists
- ...(patient) gender and tooth-type were not significant in this model.
- ...this study supports delegation of sealant delivery to auxiliaries
- ...dental assistants and dental hygienists were equal to or better than the dentists in long-term sealant effectiveness.

research in dental care

literature overview:

- Ansari G, Oloomi K, Eslami B. Microleakage assessment of pit and fissure sealant with and without the use of pumice prophylaxis. *Int J Paediatr Dent.* 2004 Jul;14(4):272-8.
- ...prophylaxis has a role in improving sealant retention
- ...removing this step may cause an increase in microleakage.

research in dental care

literature overview:

- Chadwick BL, Treasure ET, Playle RA. A randomised controlled trial to determine the effectiveness of glass ionomer sealants in pre-school children. *Caries Res.* 2005 Jan-Feb;39(1):34-40.
- ...can glass ionomer fissure sealants decrease the incidence of dental caries
- ...placed on primary molars in pre-school children at high risk of developing dental caries
- ...no evidence that (glass ionomers sealants) had any effect on caries incidence and it cannot be recommended as a clinical procedure
- BUT! Mixed with Tooth Mousse and Ozone – preventative treatment

research in dental care

literature overview:

- Suggested Protocol for Fissure Sealants;
 - Diagnosis & Record – DIAGNOdent
 - Air Abrasion to open fissure pattern
 - Check DIAGNOdent readings
 - Further preparation is necessary
 - Acid etch enamel
 - Ozone treat for 20 – 30 seconds
 - Flowable glass ionomer
 - Trim and seal with resin
 - Ozonated water mouth rinse

research in dental care

literature overview:

- Bawa S. The role of the consumption of beverages in the obesity epidemic. J R Soc Health. 2005 May;125(3):124-8.
- High intake of soft drinks is associated with:
 - 1) overweight or obesity (additional calories in the diet);
 - 2) increased risk of osteoporosis (reduced milk consumption) + Ca deficiency
 - 3) increased risk of dental caries and enamel erosion.
- School officials and parents should be aware of the health implications of vending machine drinks in schools/institutions before making a decision about pupils' and students' access to them

research in dental care

literature overview:

- Shenkin JD, Heller KE, Warren JJ, Marshall TA. Soft drink consumption and caries risk in children and adolescents. *Gen Dent.* 2003 Jul-Aug;51(4):302-3.
- each 12-oz serving of a carbonated, sweetened soft drink contains the equivalent of 10 teaspoons of sugar and 150 kcal.
- soft drinks pose a risk of dental caries because of their high sugar content and enamel erosion because of their acidity
- vending machines in schools (in the USA) have provided more than \$200 million in unrestricted revenue.

research in dental care

literature overview:

- Featherstone JD. The caries balance: the basis for caries management by risk assessment. *Oral Health Prev Dent.* 2004;2 Suppl 1:259-64.
- ...minimally invasive dentistry aims at the least possible removal of enamel or dentin, including reducing pathological factors and enhancing remineralization to avoid any removal of hard tissues.
- ...structured caries risk assessment should be carried out based upon the concept of the caries balance.
- ...the key to improved dental health for all is now for the dental profession to embrace this knowledge and put it into practice in the real world, to inhibit caries formation and progression, and to enhance the natural repair process.
- ...a change in how we manage caries is long over due. The days of drilln'fill are numbered.

research in dental care

literature overview:

- Bird (*Bird WF Caries protocol compliance issues. J Cal Dent Assoc 31(3):253-6, 2003*) showed in his study that one major problem all health care professional face is **compliance**.
- So whilst the dental profession has lots of advice, and treatment regimes for the public to follow, we cannot police what happens outside the dental practice.
- What tends to happen is that compliance is very good for the first few days (ie, patients do what they are ask to !), then it drops off over time.
- Issues, such as fluoride, calcium ions, mineral washes, coupled with miss-information from various lobbies and finally miss-interpretation of research and opinions, are allowed to cloud scientific research and evidence-based practice, so that the benefits offered by the advice from health-care professionals is negated.

research in dental care

literature overview:

- Weintraub JA. Fluoride varnish for caries prevention: comparisons with other preventive agents and recommendations for a community-based protocol. Spec Care Dentist. 2003 Sep-Oct;23(5):180-6.
- ...fluoride varnish is more effective in optimally fluoridated communities
- ...where multiple occlusal surfaces are at risk, sealants should be applied
- ...more frequent application of preventive products...should be used for people with special needs and high caries risk adults.
- ...fluoride delays the on-set of caries to late adolescence

research in dental care

literature overview:

- Kallestal C. The effect of five years' implementation of caries-preventive methods in Swedish high-risk adolescents. *Caries Res.* 2005 Jan-Feb;39(1):20-6.
- ...a; information on tooth-brushing techniques;
- ...b; prescription of fluoride lozenges;
- ...c; 6/12 applications of fluoride varnish;
- ...d; 4/12 appointments where participants were given
 - individualised information on oral hygiene and diet
 - an application of fluoride varnish.
- The preventive programmes tested were equal in showing low efficiency in adolescents with high caries risk

research in dental care

literature overview:

- Den Besten and Berkowitz (*Den Besten PK, Berkowitz RJ Early childhood caries: an overview with reference to our experience in California. J Cal Dent Assoc 31(2):139-143, 2003*)
- Anderson et al (*Anderson MH, Bales DJ, Omnell KA. Modern management of dental caries: The cutting edge is not the dental burr. JADA 1993; 126: 727-743*)
- Young (*Young DA New caries detection technologies and modern caries management: merging the strategies. Gen Dent. 2002 Jul-Aug;50(4):320-31*)
- all argue that preventative management is better than drilling - that means the use of accepted scientific evidence-based research, as well as the use of new technologies to find decay BEFORE it has a chance to make a hole.
- at the moment, the DIAGNOdent is the only real-time detection device that fits this niche.

Perhaps our profession does feel happier with an air turbine in one and, and high volume suction in the other.

Ante, GV Black and others have had their day and they belong to another era. Dycal and some of the 1st millennium materials belong there.

Surely in the 2nd millennium, it is time to move on into an era where the past concepts have been proven to be out of date in the light of the research, and take up the challenge of modern care in a new era.

Ozone will become the next innovation to change the way we practice dental care.

Holmes J, 2002



research in health care

Ozone - a holistic & natural
pharmaceutical approach
to infection control, wound
management, tissue repair



Special Offers

Information on our Technologies

Training your Team

Clinical Ozone; The CMU3 from DDL and GCE

The use of Ozone in Clinical Dentistry is well-established with over 570 papers



- Solid-State, Self-Contained Ozone Generator, Advanced Control & Integrated Monitoring Electronics for Safe & Effective Clinical Treatment
- Easy to Set-Up, Simple Controls, Plug&Play
- Use to Treat Sensitivity, Decay, Perio, Endo, Implants, Surgical Wounds, Infections
- Full Clinical Treatment Protocols Provided & In-Practice Team Training can be Arranged



CMU3 & CMU4



simple predictable healing

“This is the future of dental care”

Probably the most significant advance in dental care since the introduction of the turbine hand-piece.
Dr Chris Kammer, Madison, WI, USA 2005

Dental Studio become the first group practice in Chicago to implement the CMU₃ Ozone Therapy System.
Dr. Mladen Kralj, Chicago, ILL, USA 2009

Ozone therapy represents a major paradigm shift in the way we will treat dental decay and periodontal disease.”
Dr. Julian Holmes, London, UK, 2002





RAS Mk1 & RAS Mk2 Pro



simple air sanitisation

Room Air Sanitiser; The RAS Mk1 & RAS Pro



- Self-Contained Unit
- Eliminate Infection
- Prevent Cross-Infection
- Eliminate Clinical Odours
- Create Healthy Environment
- No Toxic Chemicals
- HTM0105/CQC Compliance
- Decontaminate Work Areas
- Sterilise Critical Areas
- Ceiling, Shelf, Wall Mounted

Bring the Out-Doors Inside!

- Solid-State, Self-Contained Ozone Generator, Advanced Control & Integrated Monitoring Electronics for Safe & Effective Environmental Control and Treatment
- Easy to Set-Up, Simple Controls, Plug&Play
- Variable Run-Times – 1 to 60 Minutes
- Low 12vDC for Safe Working Conditions
- **Exceeds HTM0105/CQC Compliance**



- Plug in Power Pack
- Set Run Time, 1-60 Min
- Set Sleep Time, 1-60 Min
- Switch On
- Automatic Operation

"The RAS System worked out-of-the-box. Set-up was a dream. We have a fresh smell all the time and no clinical odour."

Dr. Ohrten Kirjlk, Maimi, FL, USA 2009

"One of the few systems that does exactly what is claimed. We have reduced coughs, colds and illness, and our team has never been healthier since we installed the RAS in our offices." *Dr Franco Mantelli, Pisa, Italy 2007*



PEM-Duo

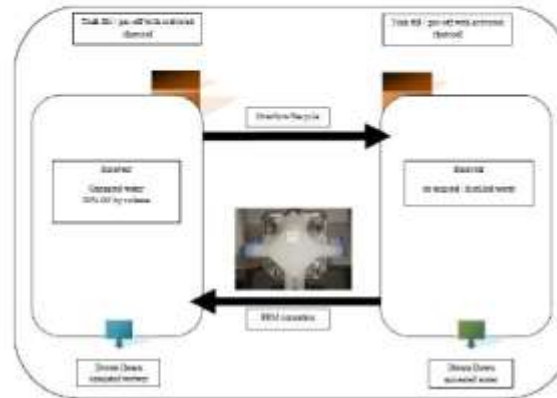


PEM-Probe

simple cross-infection control

Revolutionary New Technology; RO & Ozone Water for Infection Control

PEM-DUO – Self Contained Ozone Water Unit



- Probably the Most Advanced System to Generate Ozone Safely
- Use 'Ozo-Water' to Eliminate Infected BioFilms
- Use 'Ozo-Water' to Eliminate & Prevent Cross-Infection Risks from Aerosols
- Create a Safe & Healthy Working Environment Everyday
- No Harmful or Toxic Chemicals Required – Save Money!

The Ultimate Patient & Team Care, Safety & Protection Product For 2011

"The Most Exciting New Product for 2011 to Enable Health Care Professions to **Meet & Exceed HTM015/CQC compliance**. The PEM-Duo 'Ozo-Water' has Multiple Uses - in Dental Unit Water-Lines, as a Wipe Down, in the Ultra-Sonic Bath and Instrument Wash." *Mr Nigel Bannister, Manchester, UK January 2011.*

"This Technology from GCE Changes the Method of Ozone Generation. The PEM Unit at the Heart of the PEM-Duo Converts Pure Distilled Water Molecules into Ozone. This Eliminates Possible Contamination by Nitrogen & Other By-Products Found in Other Systems." *Dr Julian Holmes London, UK January 2009.*

"A Simple, Predictable Technology That Produces Pure Ozone at the Point of Application. This has **Multiple Applications Across Health-Care Sectors**. Ozo-Water can be Used Around the Home, as Dis-Infectant and Sterilisation Liquid in the DUWL Bottle System in Dentistry, or as a Sterilisation Medium in Veterinary Care. Endless Uses for a Safer Work Area!" *Mr Johan VanDen Berg, Pretoria, SA January 2009.*





Clin-Bin O3



simple cross-infection control

Full automatic:
O3 (<100mg/h) on when lid closes, off when lid opens
No need to touch lid; opens by means of sensor when hand comes near lid
Material: Stainless steel and O3 resistant plastic
Volume: 25L
Size: 25.5 X 35.5 X 52cm
Weight: 3.2kg
Estimated pricing: \$ 507.86





ClinSteril - O3 Steriliser



simple cross-infection control

GCE; UV-C powered sterilizer.

±Dimensions: (L)420mm x (W)290mm x (H)300mm

±Interior Capacity: 23L

±Weight: <5.5kg

Source: UV-C radiating lamps

Sterilization time: adjustable 0 to 60min (auto shut-down when cycle completes)

Prep of instruments: rinse to remove debris - can be placed wet in sterilization chamber (moisture does not influence sterilization)



Loading: preferably "non touching" in case of UV-C

Hand piece: UV-C will not damage any type of material.

O3 Vent: in case of ozone generating lamp system, ozone is vented to ambient air

Shipping: Can be safely transported via air in original packaging.

Cost; \$US 1295.00 each.

Discount on orders of 10 or more.

Time to build - 3-4 weeks from order placement.

Shipping will be billed at cost to client.

Tax / VAT is not payable as this is an export order.

Tax or dues on landing are to be paid by client





Lecture Specials from GCE

- **RAS Mk1** \$527.38 ♥ Save \$ 37.00 ♥ \$ 490.00 Lecture Special
- **RAS Mk2 Pro** \$1,210.27 ♥ Save \$ 115.27 ♥ \$ 1095.00 Lecture Special
- **CMU3**
- \$11,426.60 Includes CMU3, Manuals, 1st Service, Clinical Guide, Delivery & 2-day training in practice
- \$6,486.79 Includes CMU3, Manuals, 1st Service, Clinical Guide Delivery & Training Extra
- **\$5,125.00 Includes CMU3, Manuals, 1st Service, Clinical Guide, Show Special, Delivery & Training Extra** ♥ Save \$ 3741.60 ♥ \$ 5125.00 Lecture Special ♥ \$ 2560.00 Delivery and 2-Days Training
- **CMU4**
- \$8,582.07 Includes CMU4, Manuals, 1st Service, Clinical Guide, Delivery & 2-day training in practice
- \$4,871.35 Includes CMU4, Manuals, 1st Service, Clinical Guide Delivery & Training Extra
- **\$3,850.00 Includes CMU4, Manuals, 1st Service, Clinical Guide, Show Special, Delivery & Training Extra** ♥ Save \$ 2172.07 ♥ \$ 3850.00 Lecture Special ♥ \$ 2560.00 Delivery and 2-Days Training
- **PEM-Probe** \$236.65
- **PEM-Duo** \$3,182.56 ♥ Save \$ 227.56 ♥ \$ 2955.00 Lecture Special
- 2 x 10Litre tanks, pumped Ozo-Water Self-Contained PEM System
- **ClinBin** Insert \$507.86 Clinical Waste Bin Insert, Ozone Dis-Infection System
- **ClinBin** Complete \$ 750.00 Clinical Waste Bin, Ozone Dis-Infection System
- **ClinSteril** UV-C Steriliser \$ 1195.00 complete. ♥ Save \$ 300.00 ♥ \$ 995.00 Lecture Special
- ♥ Delivery at cost unless specified. Does not include Customs Duty or Taxes Payable in landing in USA ♥

masters of progressive health care

remineralisation
takes
TIME

masters of amputation

Steier L, Steier G, Freeman R, Lamey P, Domingo H, Lynch E. Dentists Attitudes to using Ozone, a pilot study. IADR Abstract 2006

ozone is used by more than 10,000 thousand Dentists.

treatment with ozone clinically reverses root caries in clinical trials
(Gerodontology. 2003 Dec; 20(2):106-114 and Am J Dent. 2004 Feb; 17(1):56-60)

significantly improves non-cavitated initial fissure caries in patients at high caries risk over a 3-month period (Am J Dent. 2005 18(4): 223-228).

masters of amputation

Steier L, Steier G, Freeman R, Lamey P, Domingo H, Lynch E. Dentists Attitudes to using Ozone, a pilot study. IADR Abstract 2006

Results: The results showed that all dentists in the survey felt that ozone treatment was superior to conventional techniques to manage;

- enamel caries

- smooth surface caries

- occlusal caries with < 1 mm of infected dentine

- early root caries

- deep caries with reversible pulpitis

- infected root canals

- cervical sensitivity

- managing aphtous ulcers

- treating dry sockets

- herpes labialis

- internal or external bleaching

research in natural sciences

- Ozone -

<good> or <bad>

<discard> or <invest>

<status-quo> or <forwards>

masters of amputation

‘The entry of a patient into the cycle of drill and fill is irreversible. Once a hole is drilled into a tooth, the patient always will have it; and no matter how good a clinician each dentist perceives themselves to be, any restorative material will fail at some time.’

Holmes J, 2003

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julian@greycellenterprises.com

