2017 ANNUAL SEMINAR ASHEVILLE, N.C.

# Special Care Advocates in Dentistry 2017 Lit. Review

(SAID's Search of Dental Literature Published in Calendar Year 2016\*)



Compiled by: Dr. Mannie Levi Dr. Douglas Veazey

Special Acknowledgement to Janina Kaldan, MLS, AHIP and Yi Zhou, MLIS of the Morristown Medical Center library for computer support and literature searches.

Recent journal articles related to oral health care

for people with mental and physical disabilities.

Search Program = PubMed Database = Medline Journal Subset = Dental Publication Timeframe = Calendar Year 2016\* Language = English SAID Search-Term Results = 1981 Initial Selection Result = 456 articles Final Selection Result =128 articles

#### SAID Search-Terms Employed:

- 1. Intellectual disability
- 2. Mental retardation
- 3. Mental deficiency
- 4. Mental disorders
- 5. Mental health
- 6. Mental illness
- 7. Dental care for disabled
- 8. Dental care for chronically ill
- 9. Special Needs Dentistry
- 10. Disabled
- 11. Behavior management
- 12. Behavior modification
- 13. Behavior therapy
- 14. Cognitive therapy
- 15. Down syndrome
- 16. Cerebral palsy
- 17. Epilepsy
- 18. Enteral nutrition
- 19. Physical restraint
- 20. Immobilization

- 21. Protective devices
- 22. Moderate sedation
- 23. Conscious sedation
- 24. Analgesia
- 25. Anesthesia
- 26. Dental anxiety
- 27. Nitrous oxide
- 28. Gingival hyperplasia
- 29. Gingival hypertrophy
- 30. Autism
- 31. Silver Diamine Fluoride
- 32. Bruxism
- 33. Deglutition disorders
- 34. Community dentistry
- 35. Access to Dental Care
- 36. Gagging
- 37. Substance abuse
- 38. Syndromes
- 39. Tooth brushing
- 40. Pharmaceutical preparations

# Clinical Use of Silver Diamine Fluoride In Dental Treatment

May L. Bei, BDS, MDS, PHD; Edward Chin-Man Lo BDS, MDS, PHD, Chun-Hung Chu, BDS, MDS, PHD

# Silver Diamine Fluoride

- Colorless
- Alkaline
- Fluoride Ions
- Silver lons
- 38% Solution

#### Uses

- Managing Caries in Children
- Managing Root Caries in the Elderly
- Desensitizing Teeth
- Caries control/Off Label Use

- Ammonia and Silver combine to form the Diamine-Silver Ion
- More Stable than Silver Fluoride
- Silver Ions are Bacteriocidal
- Fluoride lons promote remineralization

- Development of a squamous layer on the exposed dentin, plugging the dentinal tubules. (Hydrodynamic theory of dentin hypersensitivity).
- Increase resistance to acid dissolution and enzymatic digestion by bacterial proteases. Inhibits the proteins; matrix metalloproteinase, cathepsins and bacterial collagenases.
- Act against bacteria in lesion by breaking membranes, denaturing proteins and inhibiting DNA replication.
- "Zombie Effect" when bacteria killed by silver ions are added to living bacteria, the silver is re-activated so that effectively the dead bacterial kill the living bacteria.
- Increases in mineral density and hardness by formation of hydroxyapatite and fluorapatite along with presence of silver chloride and metallic silver.

- Low Cost
- Easy to Use
- Black Stain
- Metallic Taste
- Gingival and Mucosal Irritation
- May cause Fluorosis in Large Doses

- Does not stain sound enamel
- Many studies show no need for caries removal

- Plastic-lined cover for counter, plastic-lined bib for patient
- Standard PPE for provider and patient
- One drop of SDF into the deep end of a plastic dappen dish
- Remove bulk saliva with saliva ejector
- Isolate tongue and cheek from affected teeth with gauze or cotton rolls
- Apply petroleum jelly with cotton applicator around lip and gingiva
- Dry affected tooth surfaces with triple syringe or dry with cotton
- Bend microbrush, immerse into SDF, remove excess on side of dappen dish
- Apply directly onto the affected tooth surfaces with microbrush
- Allow SDF to absorb for up to 1minute if reasonable, then remove excess with gauze or cotton roll.
- Rinse with water
- Place gloves, cotton and microbrushes into plastic waste bags



- No consensus on frequency of application
- Once a week for three weeks (this study) for caries control
- Effective after 1 application for desensitivity

Managing Patients Using Novel Oral Anticoagulants(NOAs) in Dentistry; A Discussion Paper on Clinical Implications

> Constantinides, Rizzo,Pascalzo,Maglione

#### Purpose

• To discuss how to approach patients on NOAs before, during and after treatment

# NOAs

- Pradxa (Dabigatran Etexilate)
- Xarelto (Rivaroxaban)
- Eliquis (Apixaban)

# Advantages

- Antagonists at very specific steps of coagulation
- Provide stable anticoagulation at a fixed dose
- No need to monitor with lab exams

# Advantages

- No INR
- Rapid Onset
- Rapidly reach peak concentration
- Wide therapeutic margin
- Low drug to drug interactions
- No significant food interactions

# Methods

• Reviewed Literature through 2012

# Pradaxa

- Direct Thrombin Inhibitor
- Binds to Thrombin and prevents Fibrinogen/Fibrin

# Re-Ly

- 18,113 Patients
- Lower rates of stroke and embolism than Warfarin
- No Monitoring
- Has a reversal agent (Idarucizumab)

# **Dental Considerations**

- DTI similar to Warfarin with INR of 2-3
- Vitamin K antagonists with INR less than 3
- No direct interaction with NSAIDs

# Modification of Tx

- Renal Function
- Complexity and length of Procedure
- Patient Dependent Factors (age, aspirin)

# Xarelto

- Factor Xa Inhibitor
- Indicated for Use in Hip and Knee Rplacement Surgery
- Prevention of Cerebrovascular complications in non-valvular A-Fib
- DVT

# Rocket- AF Study

- 14,236 patients
- Significant decrease in stroke and embolism compared to Warfarin

# **Dental Considerations**

- No need to discontinue for simple extractions in patients with normal Renal function
- No need to discontinue for routine procedures

# Eliquis

- Factor Xa Inhibitor
- Same Indications as Xarelto

# Aristotle Study

- 9260 Patients
- Peak Plasma Levels in 1-3 hours
- 12 Hour ½ Life
- Excreted almost totally in Bile

# Summary

- No need to discontinue for routine procedures
- Consider if over 5 extractions or surgery over 45 minutes

# Articaine Buccal Infiltration Vs Lidocaine Inferior Block- A Review of the Literature

G. Bartlett and J. Mansoor

#### Purpose

 Compare the effectiveness of Articaine buccal infiltrations and Lidocaine Blocks in mandibular Molars

#### Articaine

- Derived from thiphene not benzene
- More lipid soluble
- More potent, faster onset

# Methods

- Literature Review
- 27 Studies

# Methods

- Compared 4% Articaine Infiltration vs 2% Lidocaine IAN block
- Permanent teeth only
- Adults only
- Mandibular Molars only
- Success = pulpal anesthesia

- Only 2 studies met these criteria
- Randomized double-blind studies

#### Results

- Success rate of 56-70% for Blocks
- Success rate of 65-70% for infiltrations

## Conclusion

• No significant difference

Management of Patients with Cardiovascular Implantable Electronic Devices in Dental, Oral, and Maxillofacial Surgery

James Tom, DDS

- Review Article
- 3 Million patients with Pacemakers or Implantable Cardioverter Defibrillators
- 250,000 new patients annually
- Electromagnetic Interference

# **Current Recommendations**

- Consultation with physician if within 30 days or if any change in medical history
- Consultation for any sedation/general anesthesia

# Electrosurgery

 If using electrosugery, keep electrode dispersal pads as far away from CIED as possible and keep exposure times short

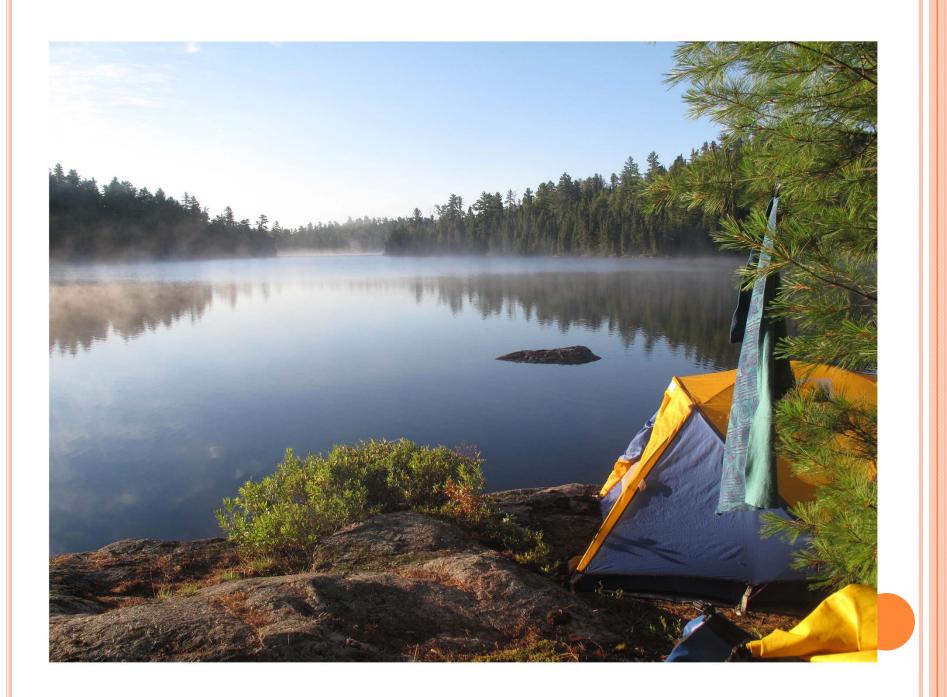
- Minimal EMI from:
- Apex Locators
- Light Curing Units
- Handpieces
- Piezoelectric Dental Scalers
- Lasers

- Very little EMI from Dental Imaging
- No effect from local anesthesia

# SPECIAL CARE ADVOCATES IN DENTISTRY 2017 ANNUAL SEMINAR

LITERATURE REVIEW

Drs. Mannie Levy and Doug Veazey



EFFECT OF OCCLUSAL CALCULUS UTILIZED AS A POTENTIAL "BIOLOGICAL SEALANT" IN SPECIAL NEEDS PATIENTS WITH GASTRIC FEEDING TUBES (GFT): A QUALITATIVE IN VITRO CONTRAST TO PIT AND FISSURE SEALANT RESTORATIONS

GENERAL DENTISTRY

JULY/AUGUST 2016

UNIVERSITY OF TENNESSEE MEMPHIS

- Studies have shown that SNPs receiving nutrition via a GFT exhibit significantly greater levels of calculus formation, and at a higher rates, than do non-GFT, orally fed populations, <u>irrespective of oral hygiene regimens.</u>
- Evidence as to why patients with a GFT experience a greater incidence of periodontal disease and lower incidence of caries is also inconclusive.

- Among the speculated causes are the decrease or absence of oral nutrition intake, alterations in salivary pH, differences in salivary calcium and phosphate electrolyte levels, and regurgitation of GFT constituents.
- The mineralization process of calculus typically occurs as dental plaque is saturated with calcium, phosphates, and carbonates from the saliva. Calculus formation is facilitated by a sustained salivary and/or oral plaque ph of 5.5 or greater.

Saliva pH in healthy person = 7.1 to 7.5

- Data suggests that salivary and plaque pH could be higher in SNPs, especially when a GFT is involved.
- Because GFT nutrition does not provide fermentable carbohydrates necessary for acid generation in oral plaque and subsequent development of dental caries, these formulas promote the accumulation of calculus in an alkaline environment.
- The increase in pH also results in decreased levels of oral cariogenic bacteria and a lower incidence of clinical caries, <u>regardless of the oral</u> <u>hygiene regimen.</u>
- Clinically, calculus appears dense and impenetrable to removal, but in fact is relatively porous.

• <u>Conclusion</u>: No marginal microleakage was noted in the calculus specimens, indicating that this substrate may serve as a "natural" occlusal surface sealant and that its removal from occlusal surfaces during routine oral prophylaxis may be Unnecessary.

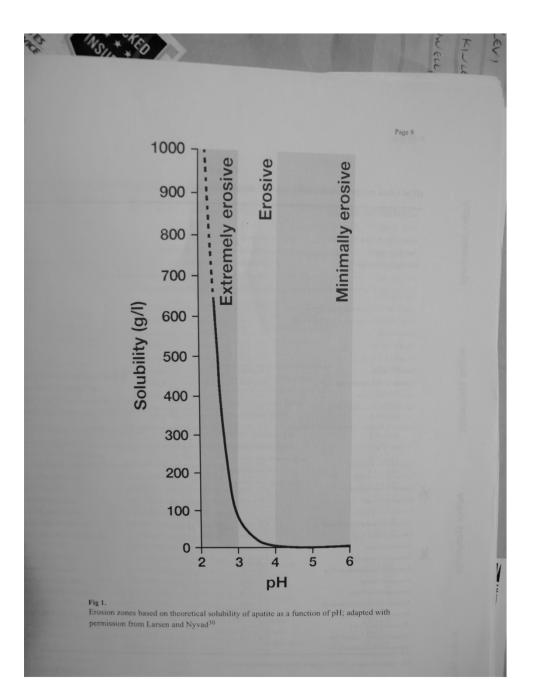
# THE PH OF BEVERAGES AVAILABLE TO THE AMERICAN CONSUMER

Journal of American Dental Association

April 2016

- 2004 total consumption of soft drink/fruit drinks for every man, woman, and child was approximately 68 GALLONS per year.
- Acids are added to beverages and compose a flavor profile giving the beverage a distinctive taste. Acids provide a tartness and tangy taste that helps to balance the sweetness of sugar.
- **Phosphoric acid** in cola drinks for tartness, reduce growth of bacteria and fungi, and improve shelf life.
- Citric acid- for tartness & preservative.
- **Malic acid** in many fruit drinks to enhance flavor. Also in artificially sweetened beverages.
- Carbonic acid- carbonated water

- Teeth erode in the pH range of 2.0-4.0, although surface enamel starts to demineralize as the pH drops below 5.5.
- Dental erosion from beverages is primarily caused by phosphoric acid and/or citric acid.
- Fluoride DOES NOT prevent erosion since highly acidic environments solubilize fluorapatite and calcium fluoride.
- Saliva is an important milieu for the negation of dental erosion by not only diluting and buffering extrinsic acids, but also providing the source of glycoproteins that coat the tooth surface as the protective pellicle.



- 380 beverages were tested for pH. 93% had a pH below 4 (erosive or extremely erosive).
- Battery Acid= 0
- Gastric Acid= 1 (reflux) (bulimia)
- Lemon Juice = 2.25
- Coke Classic = 2.37
- Pepsi = 2.39
- Kool Aid mix Tropical punch = 2.69
- 5 hr energy Berry = 2.81
- Dr. Pepper = 2.88
- Lipton Green tea with citrus = 2.93
- Coke Zero = 2.96
- Gatorade Orange =2.99
- Vitamin water Orange = 3.23
- 7 up = 3.24
- Carbonated water=carbonic acid= 5
- Coffee = 5.11

### EVIDENCE-BASED RECOMMENDATIONS FOR ANTIBIOTIC USAGE TO TREAT ENDODONTIC INFECTIONS AND PAIN

Journal of the American Dental Association
March 2016
Case Western Reserve, Ohio

- Reviewed 5 different studies.
- With sample sizes 80,40,40,41,70 patients.
- <u>Conclusion</u>: The best available clinical evidence signals NO indication for prescribing antibiotics preoperatively or postoperatively to prevent endodontic infection or pain unless the spread of infection is systemic, the patient is febrile, or both.
- Systemic administration of antibiotics does not relieve painful pulpitis nor does it resolve localized periradicular symptons.

# ARE TOPICAL FLUORIDES EFFECTIVE FOR TREATING INCIPIENT CARIOUS LESIONS? A SYSTEMIC REVIEW AND META-ANALYSIS

• Journal of American Dental Association

• February 2016

- In active incipient carious lesions, fluoride is accumulated on bacterial plaque and saliva as calcium fluoride as a result of topical fluoride applications.
- Biofilm control itself is an effective way to arrest enamel carious lesions because it promotes mechanical abrasion of the enamel surface, and clinically leads to change in the appearance of white spots from chalky and rough (active) to bright and smooth (inactive).
- Active lesions indicate that the reservoir of Fl formed from Fl toothpaste and fluoridated water has not been enough to positively affect the demineralization- remineralization process.

- A systematic review has evidenced that sealants are more effective than Fl varnish in caries prevention on occlusal surfaces.
- Studies and Conclusion:
- 4 applications at weekly intervals or 2 applications of Fl varnish over 4 mos. were effective in reversing active enamel caries lesions in primary dentition. 81% lesions were inactive with Fl varnish Vs. 38% arrested in no tx. Group.
- 3 applications with quarterly intervals on permanent teeth lead to significant decrease in caries prevalence Vs. control group over 7 mo. Interval.

## SLEEP QUALITY IN PATIENTS WITH XEROSTOMIA: A PROSPECTIVE AND RANDOMIZED CASE-CONTROL STUDY

• Acta Odontologica Scandinavica

• October 2015 • Spain

- Sleep disorders add to the pathological gravity of any illness and diminish general wellbeing.
- Numerous articles of research have indicated that saliva flow follows circadian rhythms and decreases during sleep.
- The results of the present study suggest an association between hyposalivation, sleep disorders, oral quality-of-life and psychiatric disorders among xerostomia patients in comparison with control subjects.

# NONODONTOGENIC "TOOTH PAIN" OF NOSE AND SINUS ORIGIN

• Journal of American Dental Association

June 2016Minnesota

#### • <u>Case #1-</u>

35 yo female with constant achy, throbbing pain located in maxillary anterior area. 3-5:10.

Pain of 3 mos. duration after bike fall. Endo to #8 & 9 with apico #9.

Dx. Nasal vestibulitis- diffuse dermatitis of nasal vestibule. Often caused by Staph. Aureus. Skin in nose is red, swollen, and tender

#### • <u>Case #2</u>-

- 57 yo woman with hx. of constant deep ache. Rated 5:10. Has had 14 dental procedures over 5 yrs to Maxillary Right (endo., root end surgeries, extractions, & implants).
- Last few weeks pain up to 8:10. On IV antibiotics from Infectious Disease MD.
- Medical Hx. significant for chronic sinusitis and multiple sinus surgeries.
- Dx: Neuropathic facial pain, aggravated by recurrent sinusitis, further complicated by mucociliary dysfunction. (Mucociliary apparatus consists of cilia, protective mucous layer, and airway surface liquid layer which work in concert to remove inhaled particles.)

- Maxillary teeth, maxillary sinuses, and the anterior 2/3 of the nose are innervated by branches of the maxillary division (V2) of the trigeminal branch-( 5<sup>th</sup> cranial nerve.)
- Branches of Trigeminal –V1 Opthalmic V2 Maxillary V3 Mandibular
- Inflamed sino-nasal tissues can lead to sensitization of branches within the Maxillary division of Trigeminal. Teeth in area of sinus may have sensitivity to biting, thermal, and percussion.

## AN EXAMINATION OF FACTORS RELATED TO ASPIRATION AND SILENT ASPIRATION IN OLDER ADULTS REQUIRING LONG-TERM CARE IN RURAL JAPAN

#### o Journal of Oral Rehabilitation

**o** 2016

- Swallowing disorders are a growing problem among elderly in LTC, and can cause aspiration pneumonia.
- Silent Aspiration (SA)- is defined as aspiration without clinical signs such as coughing or throat clearing. Described in many conditions and subgroups- including normal individuals. Some degree of SA at night may be normal in healthy individuals.
- Examination of oral function is essential when investigating dysphagia. Importance of lip closure,& lingual ability to stick tongue out.
- Dementia severity was the best predictor of suspected SA.

## TRANSMISSION OF BLOOD-BORNE PATHOGENS (BBP) IN US DENTAL HEALTH CARE SETTING- 2016 UPDATE

• Journal of American Dental Association

September 2016CDC- Atlanta

- BBPs of primary concern include HBV, HCV, and HIV.
- This update was review of literature from 2003 through 2015.
- Identified 3 episodes of BBP transmission in US dental settings. Will give details
- Since 1987, there have been NO transmissions of HBV or HCV in dental setting that involved an infected dentist or oral surgeon.
- The hepatitis B vaccine became commercially available in 1982.

#### • Case #1-2002 Oral Surgeon Practice

Patient to patient transmission of HBV. Source patient had chronic HBV with high viral load and had 3 ext. Index patient had 7 exts. 27 patients notified for BBP screening.

Office staff had been vaccinated for HBV and reported that they followed standard infection prevention and control practices.

Investigators could only speculate that virus had been spread via environmental surfaces despite good cleaning practices.

- HBV is a hardy virus that has been demonstrated to survive in dried blood at room temperature on environmental surfaces for AT LEAST ONE WEEK.
- HBC can survive in the environment for up to SIX WEEKS on dry surfaces, although most HBC transmissions occur through percutaneous exposure.

#### • <u>Case #2-2009 Free dental school clinic in gym</u>

5 cases of HBV infection. 3 were patients and 2 were DHCP. 1,500 people notified for BBP screening. Dental Tx. provided was Exts. and prophylaxsis.

Multiple procedural and infection prevention controls were breached- Ex. Handpieces were cleaned with disinfectant wipes rather than being heat-sterilized. Some instruments were sterilized unwrapped. Areas were in close proximity without physical barrier.

DHCPs were not always using PPE when handling contaminated items and splashed in face with fluid from suction container. Also all DHCPs had not received infection control training.

#### • <u>Case #3-2013 Oral Surgery Practice</u>

HCV infection. Source patient had multiple Ext. Index patient had Ext., bone graft, and implant. 5,810 patients notified for BBP screening.

Multiple lapses in infection control- most related to administration of IV meds by unsupervised, unlicensed, and untrained dental assistants. Contaminated medication vials used on more than 1 patient was the likely mode of transmission.

Possible routes of transmission included improperly sterilized dental equipment or environmental contamination.

#### • <u>Conclusion-</u>

Some investigators may not have reported or linked transmission of BBP in dental settings with dental tx. because of the long incubation period (up to 6 mos.) for HBV and HBC.

- Also reporting may be off due to asymptomatic course of acute infection for viral hepatitis and sometimes for HIV infection.
- And limited resources in state and local health departments to follow up on viral hepatitis cases that lacked data on risk factors.
- The CDC Guidelines for Infection Control in Dental Health Care Settings-2003 remains the standard of care for the profession.

