

The Heartbreak of Halitosis: Causes and Cures

I. CAUSES OF ORAL MALODOR

A. Non-oral causes

- Systemic Sources – diabetes, high protein/low carb diets, renal or hepatic failure, sinus infections, internal bleeding
- Medications that cause malodor – Antabuse, DMSO, Griseofulvin, Isosorbide dinitrate
- Xerogenic Medications – antidepressants, antihypertensives, CNS stimulants, narcotics

B. Dental Causes of oral malodor

- Gingivitis, periodontitis, gross carious lesions, subgingival/tongue plaque, tonsilloliths
- Bacteria include Treponema denticola, Porphyromonas gingivalis, Prevotella intermedia, Tannerella forsythensis, Porphyromonas endodontalis, and Eubacterium species

Mouth Compound	The Smell Made
Methyl Mercaptan (CH ₃ SH)	Feces
Hydrogen Sulphide (H ₂ S)	rotten eggs
Dimethyl Sulphide (CH ₃ SCH ₃)	Cabbage, sulphur, gasoline
Skatole (3-methyl-1H-indole)	mothballs, feces
Cadaverine C ₅ H ₁₄ N ₂	Corpses, urine
Putrescine (NH ₂ (CH ₂) ₄ NH ₂)	decaying flesh
Isovaleric acid	sweat, rancid cheese, sour milk

II. TESTING FOR ORAL MALODOR

A. Organoleptic Testing – sniff or smell patient's mouth and nose air-scale 0-5

B. Halimeter by InterScan (Chatsworth, CA) is an "electronic nose" for VSCs

III. CLASSIFICATION OF HALITOSIS WITH CORRESPONDING TREATMENT NEEDS (TN1-5)

Table 2 Classification of halitosis with corresponding treatment needs (TN)²²

Classification	Treatment Needs ^a	Description
I. Genuine halitosis		1. Obvious malodour, with intensity beyond socially acceptable level, is perceived.
A. Physiologic halitosis	TN-1	1. Malodour arises through putrefactive process within the oral cavity. Neither specific disease nor pathologic condition that could cause halitosis is found. 2. Origin is mainly the dorsoposterior region of the tongue. 3. Temporary halitosis due to dietary factors (e.g., garlic) should be excluded.
B. Pathologic halitosis		
(i) Oral	TN-1 and TN-2	1. Halitosis caused by disease, pathologic condition or malfunction of oral tissues. 2. Halitosis derived from tongue coating, modified by pathologic condition (e.g., periodontal disease, xerostomia), is included in this subdivision.
(ii) Extraoral	TN-1 and TN-3	1. Malodour originates from nasal, paranasal and/or laryngeal regions. 2. Malodour originates from pulmonary tract or upper digestive tract. 3. Malodour originates from disorders anywhere in the body whereby the odour is bloodborne and emitted via the lungs (e.g., diabetes mellitus, hepatic cirrhosis, uremia, internal bleeding).
II. Pseudo-halitosis	TN-1 and TN-4	1. Obvious malodour is not perceived by others, although the patient stubbornly complains of its existence. 2. Condition is improved by counselling (using literature support, education and explanation of examination results) and simple oral hygiene measures.
III. Halitophobia	TN-1 and TN-5	1. After treatment for genuine halitosis or pseudo-halitosis, the patient persists in believing that he/she has halitosis. 2. No physical or social evidence exists to suggest that halitosis is present.

IV. TREATMENT NEEDS (TN) FOR HALITOSIS

- TN-1** Explanation of halitosis and instructions for oral hygiene
Support and reinforcement of a patient's own self-care for further improvement of their oral hygiene
 - TN-2** Oral prophylaxis, professional cleaning, and treatment for oral diseases
 - TN-3** Referral to a physician or medical specialist
 - TN-4** Explanation of examination data, further professional instruction, education and Reassurance
 - TN-5** Referral to a clinical psychologist, psychiatrist or other psychological specialist
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NOTE: TN-1 is applicable to all cases requiring TN-2 through TN-5

V. TREATMENT FOR ORAL DISEASES – TONGUE CLEANERS

- A. Orafresh Tongue Blade – pediatric and adult sizes, Alwin Enterprises, 800.749-4553
- B. Oolitt – bendable and low profile loop cleaners, Deep Trading Corp, 813.931.0390
- C. Denteco – disposable razor-like, Denteco, Inc., 508.755.0804
- D. Dr. Weider's – tung brush and gel, Peak Enterprises, www.tungbrush.com
- E. Dr. Tung's – stainless steel arch/padded grippers or single handed, Dr.Tung's
- F. Vista – disposable razor-like, Vista, Inc., 414.636.9755
- G. Sakool – bendable plastic rod, U.S. Dentek Corp., 800.433.6835

VI. CHEMICAL PRODUCTS EFFECTIVE FOR ORAL MALODOR REDUCTION

- A. Zinc Salts (chloride, citrate, acetate) – sustained breath odor reduction for 3 hours
 - a. Toothpastes – TriOral, Listerine Tartar Control, Viadent Advanced Care, Aim TC, Close-Up TC, Mentadent TC, Mentadent Gum Care
 - b. Mouthwashes – Lavis, Listermint, Listerine Tartar Control
- B. Chlorine Dioxide (sodium chlorite) – sustained breath odor reduction for 5 hours
 - a. Toothpastes – Oxyfresh, CloySys II, Therabreath, Profresh,
 - b. Mouthwashes – Oxyfresh, CloSys II, Therabreath, Enfresh, Profresh
- C. Essential Oils of Listerine (menthol, thymol, eucalyptol) – sustained breath odor reduction for 3 hours
 - a. Toothpastes – Listerine EC paste and gel, Breath-So-Fresh Toothpaste
 - b. Mouthwash – Listerine EC Mouthwash, many store brands,
- D. Combinations of two of the above effective ingredients
 - a. TriOral – chlorine dioxide and zinc chloride mouthwash www.trioral.com
 - b. Breath-So-Fresh – essential oils and zinc chloride
 - c. Oxyfresh with Zinc – chlorine dioxide and zinc chloride www.badbreathcenter.com

VII. STEPWISE APPROACH TO TREATMENT OF ORAL MALODOR

- A. Good subgingival plaque control and twice daily tongue cleaning – NOT BRUSHING!!**
- B. Add zinc toothpaste twice daily. Increase zinc use with mouthwash as needed**
- C. Switch mouthwash to chlorine dioxide if response is not adequate to B**
- D. Switch to chlorine dioxide toothpaste and a combination of chlorine dioxide and zinc mouthwash if C is not adequate. Maintain twice daily tongue cleaning throughout A-D**

ORAL HEALTH PRODUCTS FOR HOME USE: WHAT SHOULD I RECOMMEND?

Karen Baker, R.Ph. M.S.

I. Regulation and Evaluation

- A. Federal Trade Commission (FTC)
- B. Food and Drug Administration (FDA)
- C. American Dental Association (ADA)
- D. Canadian Dental Association (CDA)
- E. Health Protection Branch of Canada

II. Information Sources for Dental Professionals

- A. ADA
 - Headquarters phone (312) 440-2500, (800) 621-8099
 - Internet: <http://www.ada.org>
 - Council on Scientific Affairs, Ext. 2840
 - Professional Product Review published quarterly at www.ada.org/goto/ppr
- B. ADA Additional Oral Health Benefit Required for Demonstration of Superiority
 - Manual/powered toothbrushes, floss and interdental cleaners, oral irrigators – 15% gingivitis
 - Chemotherapeutic agents to control gingivitis – 20% gingivitis
 - Fluoride-containing dentifrices – 10% improvement in caries reduction
 - Regeneration of periodontal tissues – 25% gain in periodontal attachment levels
- C. Facts and Comparisons
 - Comprehensive, comparative, and complete drug reference for the dental office
 - Many useful comparative tables including ingredients and sugar content
 - Available online as eFacts at www.drugfacts.com, or hard cover, or loose leaf, or pocket
 - To order call 800.223-0554 (MC, VISA, AMEX)
- D. Professional Newsletters
 - "Biological Therapies in Dentistry" published by BCdecker.com
 - edited by Dr. Sebastian Ciancio and published 6 times per year
 - to order call 800.568.7281 (US and Canada). Cost is \$53.75US/\$79CAN/year
 - "Clinical Research Associates Newsletter" – www.cranews.com
 - edited by Dr. Gordon Christensen and published each month
 - to order call 801.226.2121, cost is \$49/year, \$54 outside the USA
 - "Nutrition Action Health Letter" – www.cspinet.org
 - edited by Michael Jacobson – nonprofit "food police"
 - to order Fax 202.265.4954, cost is \$24/year, \$42/ 2 years for both US and CA versions
 - "Dental Advisor and Dental Advisor Plus"
 - edited by Drs. John Farah and John Powers and published 4/6 times yearly
 - "Dental Advisor" \$72/year, "Dental Advisor Plus" \$30/year, both \$82/year
 - order from Dental Consultants Inc. 313.665.2020 or 800.347.1330
- E. Promotional Literature/Product Sources
 - www.dentaldepot.com, www.drugstore.com
 - Dental Products Report \$90/yr., 847.441.3700 (Northfield, IL)
 - Dental Therapeutic Digest, Odontos Publishing, 216.953.9113
 - Dentistry Today \$40/yr, West Coast 415.721.0644, 201.783.3935
 - The Blue Book Dental Rx \$30 each, AAOP, 216.292.0229, Cleveland, OH
- F. Alternative Dental Product and Food Safety Resources
 - Natural Medicines Comprehensive Database, 800.995.8712, www.naturaldatabase.com
 - PhytoNet-www.exeter.ac.uk/phytonet, e-mail: phytonet@exeter.ac.uk
 - www.foodnews.org; www.ific.org
 - www.consumerlab.com, www.mskcc.org/mskcc/html/11570.cfm

III. Mechanical Plaque Removal Products

A. Powered Oral Hygiene Devices

1. Products Commonly Available for Retail Sale

Available Powered Devices

<u>Brand (DA rating%)</u> <u>[most useful]</u>	<u>Manufacturer</u>	<u>Price</u>	<u>ADA Seal?</u>	<u>Gingivitis Reduction</u>	<u>Product Characteristics</u>
Braun Oral-B Vitality Precision Clean [C,G]	Oral-B Labs USA 800.765.2959 CAN 800.3268.5217	\$19T	No	Yes	Compact, non-slip grip with small, cup-shaped oscillating brush. Two minute timer. Full charge lasts 5 days. 7600rpm.
Braun Oral-B Vitality Dual Clean [C,G]	Oral-B Labs www.oralb.com	\$19T	Yes	Yes	(1) Two moving brush heads, two minute timer. Full charge lasts 5 days. 7600rpm
Braun Oral-B ProfessionalCare 8000 (C,G,O)	Oral-B Labs	\$99T (39)	No	Yes	Sonic pulsations with ultra-speed oscillations. (8800rpm) Pressure sensor,40,000/minute, speed control settings
Braun Oral-B ProfessionalCare 7000 [G,I,P]	Oral-B Labs	\$89T (30)	No	Yes	40,000 pulsations/min, 8800rpm 2-speeds, pressure sensor, 660 movements/sec
Braun Oral-B ProfessionalCare 5000 [G,I,P]	Oral-B Labs	\$49T	No	Yes	7000 rpm,20,000 pulsations per minute, timer stops after two minutes-no 30 sec indicator, pressure sensor indicator
Braun Oral-B Advance Power 450 TX [C,G,O]	Oral-B Labs	\$20T	No	Yes	No pulsations, 1 minute stop and go timer, Uses disposable AA batteries, has indicator bristles, non-slip grip Claims-“ better than Colgate Actibrush data on file”
Braun Oral-B Triumph ProfessionalCare 9000 -with SmartGuide	Oral-B Labs	\$129T	No	Yes	40,000/8800,4 speeds, “Smart Tech Displays”
Braun Oral-B CrossAction PowerMax	Oral-B Labs	\$15	No	No	Visible timer for enhanced compliance Replaceable brush heads, bristle indicator for replacement, rechargeable power
Braun Oral-B CrossAction Power	Oral-B Labs	\$6	No	No	Replaceable brush heads, bristle indicator for replacement, battery powered
Braun Oral-B Pulsar Vibrating Micropulse 35 Soft or 40 Medium	Oral-B Labs	\$6	No	No	Battery powered, pivots & pulses, fully disposable-product not designed to be opened
Braun Oral-B Stages for Kids	Oral-B Labs	\$7	No	No	Rotating power head brushes in 6 ways, disposable handle, battery powered, brush head NOT replaceable
Crest Spinbrush (1) Classic (2) Classic Clean (3) MultiAngle (4) Kids	Proctor & Gamble (sold to Church&Dwight) www.spinbrush.com	(1) \$5 (2) \$6 (3) \$6 (4) \$6	No	Yes	(1) Brush heads replaceable, battery powered (2) Spinning head & multi level bristles, battery powered, replaceable head (3) Spinning head and stationary “V” cut bristles which are angled in 3 directions, color

Crest Spinbrush Pro (1) Clean (2) Whitening	P & G, sold licensing rights to Church&Dwight	(1) \$7 (2) \$8	No	Yes	signaling bristles, battery powered, replaceable head (4) Brush heads NOT replaceable, battery (1) Replaceable brush head, combination of spinning head and up-n-down bristle movement, battery powered (2AA) (2) Dual action brush head w/ whitening bristles, battery powered, replaceable head
Interplak Power Plaque (DPI9) [C,G,I,O,P] (92) (2) RTG3CSR (3) NT7CS	Conair 800-633-6363 www.conair.com	(1) \$60T (25) (2) \$28 (3) \$28	Yes	Yes	(1) 2 speeds, no power base, 2 minute auto-shutoff, travel case, 1 yr warranty, CRA-2.3 (2) Color Indicator Ring, rechargeable (3) 8-Tuft Brush head, rechargeable, grip handle
Time Machine [C,G,DEX] (86)	Oralgene USA 800.933.6725	\$40	Yes	No	Cleans 6 dental surfaces at once, entire mouth in 1 minute. Any TP OK. 300 strokes/min
Plaque Control 3000 [G,O] (87)	Waterpik Tech	\$39	Yes	No	Circular brushing motion and contoured bristles. Any TP OK.
Sensonic Toothbrush-SR-700	Waterpik Tech www.waterpik.com				30,000 brush strokes /min, power/charging indicator, pressure sensor adjusts brush speed, dishwasher safe
Reach Power Brush	J & J www.jnj.com	\$16	Yes	No	Center bristles rotate 3,000rpm Outer blue bristles don't move
Rota-dent [I,O,P]	Pro-Dentec 870.698.2300 www.prodentec.com	\$150T (\$55)	W/D	Yes	Most tested in perio maint.pts. office training needed. 3 brush types available. Any TP is OK Microfilament brush tips, 90,000 filament sweeps per second
Colgate Motion	Colgate Palmolive Company www.colgate.com	\$7	No	No	Dual action head, rotating bristles, curved neck, replaceable heads
Colgate Motion Whitening	Colgate Palmolive Company	\$8	No	No	Dual action head, rotating bristles, soft rubber polishers remove stains
GUM Kids	Butler Company	\$7	No	No	Oscillating action bristles, larger handle, replaceable heads, battery powered
Wisdom Spinbrush II	Wisdom Toothbrushes Limited	\$8	No	No	Oscillating movements, battery powered, non-replaceable brush heads, angled neck, two power cleaning settings
SONIC ACTION					
SynchroSonic Plus Advanced-DT400 [I,O,P] (85)	Teledyne Waterpik Tech 800.525.2020	\$79T (25)	Yes	No	2-speeds, 2-minute timer w/ 30 sec quad alert, 40,000 brush strokes /min, uses ultrasonic vibration, power/charging indicator light, 4 attachments, dishwasher safe, Any TP OK
Sonic Complete [G,I,O,P]	Oral-B	\$79T	No	Yes	31,000 strokes/min, memory 2-min timer and 30second quadrant timer,3 speeds, 2-yr warranty, crisscross bristle toothbrush heads

Vitality Sonic [C,G]	Oral-B	\$19T	No	Yes	20,000 strokes/min, crisscross bristles, 2 minute timer, rechargeable
Sonicare Crest IntelliClean System (1) i8500 (2) i8300	Phillips 800-682-7664 www. sonicareonline. com	(1) \$159T (2) \$139T	No	Yes	(1) 2 minute smart timer, programmable quadpacer 30 second interval timer, dual speed control (2) Toothpaste dispensing button, brushing performance regulator, recharge level indicator, smartimer 2-minute timer
Sonicare Advance Ultrasonic 4100 TB 4300,4700 [G,I,O,P] (91)	Phillips	\$85T (49)	W/D	Yes	31,000 strokes/min. 2 minute timer and 30 second quad pacer. Any TP OK. CRA- 2.2 Brushing power ramp-up,
Sonicare Elite TB and P [G,I,O,P] (1) 7300 (2) 9500	Phillips 800-682-7664 www. sonicareonline .com	(1)\$109T (2)\$130T	No	Yes	(1) Dual color recharge indicator. 2 minute Smartimer. Quad pacer 30 second interval timer. (2) 2-yr warranty, 2 speed setting, programmable quad pacer 30-sec interval timer, 2-minute Smartimer, recharge gauge
Sonicare FlexCare (1)RS930 (2)R910		1) \$169T 2)\$149 T	No	Yes	(1) integrated sanitizer, smart timer, (2) smart timer, Quadpacer
Sonicare Xtreme e3000		\$39.99T	No	Yes	2 AA batteries, for pre-teens and teens
Sonicare HealthyWhite R732 R710		\$139.99 \$119.99 both T	No	Yes	3 modes – clean, sensitive, clean&white 2 modes-clean, clean&white
Sonicare Essence and P (1) e5500 (2)e5300	Phillips	\$120T \$100T	No No	Yes Yes	(1) Quadpacer 30-sec interval timer, recharge indicator, 2 minute smartimer, angled neck (2)No quadpacer, only 1 brushhead
Supersonic [C,G,O] (87)	American Dentronics 760.757.5380	\$80 (40)	No	No	Not available retail, 31,000strokes/minute, Brush and floss are available.
Sonic-1 Cybersonic Oral Care Toothbrush	Amden Inc.	\$70T	No	No	47,000 strikes/min, uses harmonic resonance, 2 brush heads, 2 attachments, “done-in-one” timer
UltraSonex (84)	Salton-(Sonex Int) 800.233.9054 www.saltoninc.com	\$39T	No	No	Manual brush with 1.6 mil cycles per min. Preset for 3 minutes. Avoid if cardiac pacemaker pt. Any TP OK. CRA- 2.6
Ultima	Salton	\$119	No	No	18,000 strokes/min. plus 1.6 mill cycles/min.
Ultreo	Ultreo, Inc. www.ultreo.com Redmond, WA	\$149			Bubbles vibrate 20,000 times/second Ultrasonic frequency is less than 500KHz per operating cycle

C = child, G = gingivitis, I = implants, O= ortho, P = periodontitis, Dex = dexterity not required

IV. Chemotherapeutic Products for Home Use

Chemotherapeutic Categories

1. **General Mechanisms of Action**
 - Decrease rate of new plaque accumulation
 - Decrease or remove existing plaque
 - Suppress growth of pathogenic microflora
 - Inhibit production of virulence factors

2. **Application Method**
 - Brush on dentifrices or gels
 - Mouthwash: pre-brushing or postbrushing
 - Mouthwash: pre-procedural
 - Irrigation: supra-gingival or sub-gingival
 - Local application reservoir

CHEMICAL CATEGORIES OF SPECIFIC AGENTS AND PRODUCTS

<u>CATEGORY</u>	<u>SPECIFIC AGENTS</u>	<u>PRODUCT NAMES</u>
Anionic Surfactants	Sodium Lauryl Sulfate	Pre-brushing rinses, almost all toothpastes
Bisbiquanides	Chlorhexidine	Peridex, Periogard, ProSoL PerioChip, generics
	Alexidine	European products only
Halogens	Chloramine-T	Chlorazene
	Chlorine Dioxide	Oxyfresh Rinse/Paste, Clos-Sys IIRinse/Paste, etc.
	Fluoride	MFP= 14% F ⁻ , NaF= 45% F ⁻ , SnF ₂ = 24% F ⁻ ,
	Iodine/Iodophors	Ora-5
	Oxychlorosene	Kasdenol
	Povidone-iodine	Betadine, Perimed
Heavy Metal Salts	Zinc Citrate or	Mentadent Gum Care, TC (Aim, Close-Up, Mentadent)
	Zinc Chloride	Lavoris, Listermint, Viadent Advanced Care TP
	Tin	Various stannous fluoride preparations
Herbal Extracts	Melaleuca	Confident Paste and Rinse, Tea Tree Products, etc.
	Sanguinaria	Many "natural" oral health products
Oxygenating Agents	Carbamide Peroxide	Gly-Oxide, Proxigel, Many Office Preparations
	Perborates	Amosan
	Peroxides	Ortho-Fluor, Perimed, Peroxyl, Crest Whitening Rinse
Phenolic Compounds	Hexylresorcinol	S.T. 37
	Listerine (thymol, Eucalyptol, Menthol, methylsalicylate)	Many generic formulations also available
	Phenol	Cepastat, Chloraseptic, Sensodyne Comfort Rinse
	Triclosan	Mentadent-P (zinc citrate, NaF), Crest Gum Health/Ultra(5% pyrophosphate, NaF), Colgate Gum Protection (2% copolymer,NaF) Colgate Total (2% copolymer, NaF)
Quaternary	Benzethonium Chloride	Scope, Crest Toothpaste with Scope
Ammonium	Cetylpyridinium Chloride	Cepacol, Crest Pro Health Viadent Rinse,BreathRx
Compounds	Domiphen Bromide	Scope
Surface modifying	Delmopinol	Decapinol (Sinclair-UK) and Impede (OraPharma, Inc.)
Agents	Simethicone, dimethicone	AP-24, Control Rx by Omnii

B. Dentifrices [\$4.2 Billion spent in 2007]

1. Types

FLUORIDE/REMIN	ANTI-PLAQUE	ANTI-CALCULUS	BAKING SODA	"NATURAL"
KID'S	MOUTHWASH	DESENSITIZING	SMOKER'S	WHITENING
				REJUVENATING

2. DENTIFRICE PRODUCT TABLETS WITH IMPORTANT CHARACTERISTICS

a. ADA Accepted Fluoride Dentifrice Characteristics (# NOT ADA Accepted)

<u>Product</u>	<u>F Compound</u>	<u>Cleaning*</u>	<u>Abrasion*</u>	<u>RDA+</u>
Aqua-Fresh Fl Protection (GSK)+++	.76 MFP	59 (3)	M	108+
Colgate Cavity Protection gel/paste+++	.76 MFP	39/(4/3)	M/L	68+
Colgate For Kids gel/paste (CP)+++	.243NaF	40/(4/3)	M/	77+
Control Rx (Omnii)#	1.1% NaF	-	-	80
Crest Regular Mint paste/gel (P&G)+++	.243 NaF	69/70(4)	M	106+/96+
Fluoridex (Discus)#	1.1% NaF	-	-	-
Mentadent Advanced Cleaning (C&D)	.243 NaF	(4)	M	118
Oral-B Sesame Street (Oral-B)	.243 NaF	-	-	-
Pepsodent (Unilever)	.76MFP	-	-	100
Prevident 5000 Plus (CP)#	1.1% NaF	-	-	80
Pro-Dentx (Pro-Dentec)	1.1% NaF	-	-	90
Reg Strength Aim paste/gel (Unilev)+++	.80 MFP	/58	M	120
Shane (Jerome Milton Inc.)	.243 NaF	-	-	-
Tom's of Maine Anti-Cavity F- (Colgate)	.80 MFP	59/(4)	M	90+

*Consumer Reports, 9/1992 or 8/1998

~Journal of Dentistry 20:283-286, 1992

#Available Rx only, not ADA accepted

~Reported by Manufacturer

+ADA Council on Dental Therapeutics, May 1993

++Oral Health Research Institute, Indiana Univ. RDA 92-69

+++ CDA Accepted

() Cleaning score in Consumer Reports 8/1998 on a 1-5 scale

PATIENT POINTS:

1. NaF best for root caries risk and recession patients
2. 5000ppm is 25-35% better mineralizer than 1000ppm
3. SnF 0.4% is really about 970ppm which is similar to other OTC fluoride dentifrices
4. NaF is 45% fluoride, MFP is 14% fluoride, SnF is 24% fluoride

b. ANTI-PLAQUE AND GINGIVITIS DENTIFRICES (*Two are ADA Accepted for Plaque/Gingivitis)

<u>Product*</u>	<u>Cleaning</u>	<u>F⁻</u>	<u>RDA</u>	<u>Other Ingredients</u>
AP-24 (Nu-Skin)	-	MFP	-	Dimethicone, surfactants Poloxamer 407, 338
A&H Advanced Breath Care	29	MFP	-	Zinc citrate 2%, baking soda
Biotene (Laclede)	-	MFP	55	Glucose oxidase, lactoperoxide
Blend-A-Med (Blendex)	-	MFP	-	Allantoin, urea
Close-Up Anti-Plaque (Unil)	62	SnF	85	Stannous pyrophosphate, zinc citrate
CloSys II (Rowpar)	-	-	53	Stabilized chloride dioxide 0.1%, no SLS
Colgate Total (CP)* +++	60/(3)	NaF	70	Triclosan 0.3%, Gantrez 2%
Crest ProHealth (PG)	-	SnF	-	Stannous Fluorite, Sodium hexametaphosphate
Kolynos Perio (C-P)	-	NaF	-	NaCl, ZnCl, baking soda
Listerine EC paste/gel (J&J)	60/(4)	MFP	85	Essential oil ingredients as in the rinse
Mentadent AdvanceCare (CD)	-	NaF	103	Zinc citrate 2%, baking soda, hydrogen per.
Oral Defense (BioGlobe Tech)	-	NaF	-	Cetylpyridinium Cl, no SLS
Oxyfresh (Oxyfresh USA)	-	-	-	Stabilized chloride dioxide
Tom's of Maine Antigingivitis	-	-	68	Zinc citrate 2%, xylitol, baking soda
Viadent Adv. Care (C-P)	-	MFP	-	Zinc citrate 2%, no sanguinaria (bloodroot)

* Colgate Total and Crest ProHealth are ADA accepted for plaque/gingivitis reduction beyond regular fluoride toothpaste

PATIENT POINTS

1. Triclosan toothpaste reduces mild/moderate gingivitis 20-30% compared to regular fluoride toothpaste
2. Essential oils or zinc are about 16-19% effective at reducing gingivitis
3. Chlorine Dioxide toothpaste is NOT effective at reducing gingivitis
4. Crest Pro-Health reduces mild/moderate gingivitis about 25% compared to regular fluoride toothpaste

c. BAKING SODA DENTIFRICES

<u>Product</u>	<u>F⁻</u>	<u>RDA*</u>	<u>% Baking++</u>	<u>% Hydrogen++</u>	<u>Cleaning+</u>
			<u>Soda</u>	<u>Peroxide</u>	
A&H Dental Care Smooth Spearmint (Church & Dwight)	NaF	57	30	-	24
Aquafresh Baking Soda (GSK)	MFP	65	.5	-	(3)
Arm & Hammer Baking Soda (Church & Dwight)	-	7	100	-	-
A&H Dental Care Toothpowder (Church & Dwight)	NaF	8	94	-	-
A&H Dental Care Gel (Church & Dwight)	NaF	62	30	-	55
A&H Dental Care Paste (Church & Dwight)	NaF	49	65	-	28(2)
A&H Enamel Care with Liquid Calcium (C&Dwight)	NaF	65	30	-	-
Aim Baking Soda Gel (Unilever)	MFP	-	.5	-	-
Close-Up Baking Soda Paste (Unilever)	MFP	80++	.5	-	-
Colgate Baking Soda Paste (Colgate)**	NaF	52	25	-	51
Colgate TC Baking Soda and Peroxide Paste (Colgate)	NaF	92	12	0.50CaPeroxide	(4)
Mentadent Advanced Cleaning (C & D)**	NaF	118	5	.75	57
Mentadent Replenishing White (Church&Dwight)	NaF	118	5	.75	53
Peak (C-P)	-	40	-	-	29
Pepsodent with Baking Soda Paste (Unilever)	NaF	80++	5	-	-
Perigel (Zila Pharmaceuticals)	NaF	-	59	3	-
Peroxicare (Church & Dwight)	NaF	42	52	0.75NaCarbPerox	25
Rembrandt Baking Soda Formula (J&J)	MFP	55	-	-	-
Sensodyne Baking Soda (Block) (SLS)	NaF	67	-	-	(3)
Tom's of Maine BS Peppermint/Gingermint (Colgate)	MFP	68	5	-	-

*Indiana Oral Health Research Institute, 1999

+Consumer Reports 9/98, ++Per Manufacturer, **ADA Accepted for Caries Reduction

PATIENT POINTS

1. Higher baking soda content leads to lower cleaning scores

2. Baking Soda and Hydrogen Peroxide have no therapeutic effect singly or in combination.

c. ALTERNATIVE OR HERBAL DENTIFRICES

<u>Product/Manufacturer</u>	<u>Claims</u>	<u>"Active Ingredients"</u>
Auromere (www.auromere.com)	Invigorates/purifies	Neem, Peelu, 24 herbal extracts
Dabur (Nature Care)	Astringent/cleaning	Tulsi, Loturbark, essential oils
DentiCare Tooth Polish (Melaleuca, Inc.)	Benefits bleeding gums	Melaleuca, propolis, myrrh
Dentaforce (Bioforce)	Astringent/stimulant	Echinacea, rosemary, essential oils
Eco-Dent (Eco-Dent 888.Eco.Dent)	Hardens enamel w/o F ⁻	BS, tartaric acid, CaCO ₃ , myrrh
Cool Mint (Nature's Gate)	Antiseptic/ "free" calcium	Sage, vitamin C, Calcium Carrot Pwd.
Healthy Teeth & Gums toothpaste (www.thenaturaldentist.com)	Prevent cavities/fight gingivitis	MFP, aloe vera, echinacea, goldenseal, calendula, propolis, grapefruit seed extr.
Homeodent (Boiron-Borneman)	No-mint	Calendula, plantain, horseradish, witchhazel
Jason Toothpaste (www.jason-natural.com)	Best tasting natural toothpaste!	CoQ10, Aloe Vera, Sea Salt, Melaleuca, Perilla Seed Extract
MouthFx (www.mouthfx.com)	Gum support/perio protection	100% natural essential oils
NutriBiotic Dental Gel (www.nutriBiotic.com/dentalgel)	97% effective in 41 countries	Grapefruit Seed Extract, Zinc Citrate, sanguinaria, aloe vera, stevia
Parodontax-F (www.parodontax.de) GSK	Supports teeth and gums, No fluoride which is toxic	Rhatany, chamomile, myrrh, fluoride
Peelu (Peelu Products)	Soothing herbs/mineral plus Fl-	Peelu fiber, natural sorbo fruit juice
Propolis TP (Beehive Botanicals)	Miswak/Siwak chewing stick	Propolis, xylitol, flavoring oils
Rembrandt "Naturals" (J&J Den-Mat)	Protects hive, benefits mankind	Freshening/Invigorating/Soothing forms
Tea Tree Oil TP (Desert Essence)	Antioxidant, vit. C, Calcium	Melaleuca, propolis, ginger
Tea Tree TP (Thursday Plantation)	Especially good for gingivitis/perio	0.4% melaleuca, chlorophyllin-copper
Tom's of Maine (Colgate)	Healthy gums, decrease tartar	Some with F-, xylitol, many formulas
Tooth and Gum Paste (DHC)	No dyes, preservatives, sweetners	Echinacea, green tea, essential oils
	No SLS, "natural F source" (tea)	

PATIENT POINTS: 1. Non-Fl: Dabur, Denticare, Dentaforce, Propolis, Rembrandt Naturals, Tea Tree Toothpaste

2. Fl: Denticare, Healthy Teeth&Gums, Tom's of Maine Fl-, Tooth&Gum Paste

e. TARTAR CONTROL DENTIFRICES

Product	F⁻	Cleaning+	RDA*	Other Ingredients
Aim TC (Unilever)**	.80 MFP	-	108	Zinc citrate 0.5%
Aquafresh TC (GSK)** +++	.24 NaF	(4)	124	Tetra NA pyrophosphate 3.3%
A & H TC Toothpaste (C&D)	.24 NaF	-	34	Napyrophosphate, Naphosphate
A&H TC Gel (C&D)	.24 NaF	-	71	Napyrophosphates
Close-Up TC Paste (Unilever)	.76 MFP	62	98	Zinc citrate 0.5%
Close-Up TC Gel (Unilever)	.76 MFP	63	-	NaCl, zinc citrate 0.5%
Colgate TC Gel (CP)** +++	.24 NaF	74	87	3.3% tetraNapyrophosphate, PVM/MA
Colgate TC Paste (CP)** +++	.24 NaF	62	113	3.3% tetraNapyrophosphate, PVM/MA
Colgate TC Gel/Paste MCF (CP)** +++	.24 NaF	-	87/113	3.3% tetraNapyrophosphate, PVM/MA
Colgate TC Micro Cleansing (CP)** +++	.24 NaF	(4)	112	3.3% tetraNapyrophosphate, PVM/MA
Crest Multicare Toothpaste (P&G)	.24 NaF	61/(4)	118	BS, xylitol, tetraNA pyrophosphate
Listerine EC TC Gel/Paste (J&J)	.76 MFP	(4)	90	Zinc citrate trihydrate, essential oils
Mentadent Advanced Care Paste (C&D)	.24 NaF	(4)	103	Zinc citrate 0.5%, BS 5%
Natural White TC (Natural White)	.24 NaF	-	113	TetraK pyrophosphate
Pepsodent TC (Unilever)	.76MFP	-	-	Zinc citrate, silica
Rembrandt TC Paste (J&J)	.80 MFP	-	55	"Citroxain" = alumina, papain, citric acid
Sensodyne TC/Plus Whitening (Block)	.24 NaF	-	-	KNO ₃ , tetra Kpyrophosphate, silica
Tom's of Maine TC&Whitening (Colgate)	-	-	90	Zinc citrate, xylitol, hydrated silica
Ultra-Brite All in One (C-P)	.24 NaF	-	-	Pyrophosphates, no alumina

*ADA CDT, May 1993,

**ADA Accepted, +Consumer Reports 1992, 1998

- PATIENT POINTS: 1. Pyrophosphates are associated with dentinal sensitivity and soft tissue lesions.
 2. Sodium Hexametaphosphate produces adverse effects equivalent to standard pyrophosphates.
 3. Switch to zinc salts to get calculus reduction without sensitivity and soft tissue lesions.

d. DESENSITIZING DENTIFRICES

Product	F⁻	Densitizer	Cleaning+	RDA++
Aqua-Fresh Sensitive (GSK)* +++	NaF	5% KNO ₃	(3)	-
A&H Dental Care Sensitive Formula	NaF	5% KNO ₃	50/(2)	48
Biotene Sensitive Toothpaste (Laclede)	MFP	5% KNO ₃	-	55
Colgate Sensitive (CP)	SnF	5% KNO ₃	-	-
Crest Sensitivity Protection (P&G)* +++	NaF	5% KNO ₃	(3)	100
Orajel Sensitive (Del)*	1%MFP	5% KNO ₃	-	-
Plus-White Desensitizing (CCA)	MFP	5% KNO ₃	-	-
Rembrandt for Sensitive Teeth (Den-Mat)	MFP	5% KNO ₃	(3)	-
Sensodyne Baking Soda (GSK)	NaF	5% KNO ₃	(3)	55
Sensodyne Cavity Prevention (GSK)* +++	MFP	5% KNO ₃	(3)	-
Sensodyne Fresh Mint* (GSK)	MFP	5% KNO ₃	-	-
Sensodyne Cool Gel (GSK)	NaF	5% KNO ₃	-	-
Sensodyne Original Flavor (GSK)	MFP	5% KNO ₃	80	70
Sensodyne ProEnamel (GSK)	NaF	5% KNO ₃	-	70
Sensodyne-SC (GSK)- No SLS	-	10% SrCl	-	-
Tom's of Maine Sensitive Teeth Natural Toothpaste (Colgate)	-	5% KNO ₃	-	68
Topol Plus Sensitive Teeth (Dep)	MFP	5% KNO ₃	-	-

* ADA accepted for Dentinal Hypersensitivity, + Consumer Reports September 1992 or August 1998 ()

- PATIENT POINTS: 1. Potassium Nitrate is the most effective OTC desensitizer.
 2. Patient should consult dentist after 4 weeks of twice daily use with no positive effects.
 3. Abrasivity should be selected at an RDA of 120 or below.

g. WHITENING" DENTIFRICES (# ADA Accepted for Extrinsic Stain Removal)

Product	F⁻	Cleaning	Abrasion+	RDA	"Whitening Ingredients"
Aquafresh Whitening TC (GSK) #	NaF	(4)	M	113	Sodium tripolyphosphate
A&H Dental Care Adv. Whitening	NaF	(3)	L	49	TetraNapyrophos,BS Napercarbamate
Caffree Paste (Block)	MFP	77	H	163++	Silica
Close-Up Paste/Gel (Unilever)	MFP	85/72(4)	H	218/161++	Silica, titanium dioxide in Clear
Colgate Fresh Confidence Whitening	NaF	75	M	-	TetraNa pyrophosphate,Ultra mint
Colgate Sensitive Plus Whitening	SnF	51		120	Micronized Silica
Colgate Sparkling White BS, Per	MFP	-	-	-	Silica, BS, pentaNa triphos, pyropho
Colgate Sparkling White TC #	NaF	69	-	190	Silica, pentaNa triphosphate, pyropho
Colgate Total Plus Whitening #	NaF			-	Triclosan, Gantrez, silica
Colgate Whitening BS, Per, TC	MFP	(5)	M	145	BS, alumoxide, pyrophos, td, Caperox
Crest Dual Action Whitening (P&G)#	NaF	(5)	M	109	Sodium Hexametaphosphate,hydrated silica
Crest Multicare Whitening (P&G) #	NaF	62	M	144	Silica 31%, BS 1.5%, pyrophosphate
Crest Whitening Plus Scope (P&G)	NaF	52	M	125	Scope MW ingredients,pyrophosphate
Gleem (P&G)	NaF	79	M	118++	Silica, triNaphosphate, titanium diox
Mentadent Advanced White (Unilev)	NaF	(4)	M	-	
Natural White (Natural White)	-	-	M	101++	Silica, glycerin, titanium dioxide
Pearl Drops BS Paste (Carter)	NaF	-	-	-	TetraK&Na pyrophosphates, BS, td
Pearl DropsPaste (Carter)+++	NaF	74		-	Silica
Pearl Drops Toothpolish (Carter)	NaF	(4)	H	227++	Silica, AlHydroxide, triNaphosphate
Pepsodent F ⁻ (Unilever)	MFP	58	M	128 ^c	Silica
Platinum (C-P) #	MFP	(5)	M	112+	Aluminum oxide, titanium dioxide
Plus White (CCA)	MFP	-	M	94++	TriNaphosphate, monoNaphosphate
Rembrandt Plus #	MFP	53(3)	L	55++	Citroxain(papin, alumina, NaCitrate)Carbamide peroxide
Rembrandt Plus Premium Whit. Gel with Peroxide	MFP	-	L	70+	Carbamide peroxide < 3% citroxain
Rembrandt Whitening Cankersore Prevention	NaF	-	L	55++	Citroxain, hydrated silica
Rembrandt Intense Stain Removal	NaF	-	-	94	Dicalcium phosphate,silica,alumina
Sensodyne Extra Whitening (Block)	MFP	-	-	104	KNO ₃ , calcium peroxide
Simply White by Colgate	NaF	57	-	-	H ₂ O ₂ , MPPH, Silica in divided tube
Supersmile (Robell Research)	MFP	-	L	62+	Calcium peroxide, titanium diox, BS
Topol Plus BS (Topol-Dep)	MFP	-	-	-	Silica, BS, diNaphosphate, titan diox
Topol Smoker's Fluoride Gel (Dep)	MFP	82	H	257++	Silica, Zirconium silicate, titandiox
Topol Smoker's Toothpaste/Fl ⁻ (Dep)	MFP	76	H	277++	Silica, Zirc. silicate, titan. diox., tetra NaPyrophosphate
Ultra-Brite BS (C-P)	MFP	-	M	-	Silica, BS, alumina, titanium dioxide
Ultra-Brite BS & Peroxide (C-P)	MFP	(3)	M	-	Silica, BS, prop glycol, Caperoxide
Ultra-Brite Paste/Gel (C-P)	MFP	86/72(5)	M/M	133++	Silica, alumina, titan. dioxide, pyro
Vivid White by Crest (P&G)	NaF	-	-	-	Whitebond Protection, Silica

*Consumer Reports 9/92 or 8/98 Journal of Dentistry 20:283-286, 1992, +Reported by the manufacturer 5/95 (L=low, M=moderate, H=high), ++Oral Health Research Institute, Indiana University, RDA 92-69, # = ADA ACCEPTED FOR REMOVAL OF SURFACE STAIN

- PATIENT POINTS:**
- 1. Toothpastes cannot effectively bleach teeth and can only remove extrinsic stain.**
 - 2. Cleaning ability does not necessarily correspond to abrasivity.**
 - 3. Chronic exposure to peroxides should be avoided in tobacco users.**
 - 4. FDA recommends RDA limit of 200 while ADA recommends limit of 250.**

a. Problems with Whitening Toothpastes

- Soft tissue damage due to acid pH, long term peroxide exposure??, or detergent sensitivity
- Hard tissue damage due to acid pH or excessive abrasion
- Misperceptions of Cleaning effectiveness because film "feels" smooth and pigment "looks" white

b. Patient-Specific Product Recommendations

1. Pellicle stain/ no exposed roots/ no canker sores
 - ◆ Colgate Whitening BS, Per, TC/ Crest Dual Action Whitening/ Crest Multicare Whitening/Ultra-Brite Paste
2. Pellicle stain/ exposed roots/ no canker sores
 - ◆ Aquafresh Whitening/ Crest Dual Action Whitening/ Gleem/Platinum
3. Pellicle stain/ exposed roots/ canker sores
 - ◆ Platinum/ Gleem
3. Smokers
 - ◆ Avoid, Colgate Whitening/Mentadent/ Rembrandt BC or DW/ Stay White/ Supersmile/ Ultra Brite BS & Peroxide/ White Step (any toothpaste with peroxides)

V. CREST WHITESTRIPS: HOW MANY TYPES ARE THERE?????

A. Retail Purchase:

1. Crest Whitestrips Classic – 6% HP in 56 strips for 14 days of twice daily use
2. Crest Whitestrips Premium – 10% HP in 28 strips for 7 days of twice daily use
3. Crest Whitestrips Premium Plus – 10% HP in 40 strips for 10 days of twice daily use
4. Crest Whitestrips Renewal – 9.5% HP in 40 strips for 10 days of twice daily use
5. Crest Multicare Daily Whitestrips --6.5% HP in 42 upper/lower for 5min once daily

B. Dental Office Dispensed:

1. Crest Whitestrips Professional – 6.5% HP in 84 strips for 21 days of twice daily use
2. Crest Whitestrips Supreme – 14% HP in 84 strips for 21 days of twice daily use

C. Effectiveness

1. Original Whitestrips – overall color improvement 2.96 in 14 days
2. Whitestrips Premium – overall color improvement 3.2 in 7 days
3. Professional Whitestrips – overall color improvement 4.20 in 21 days-discontinued??
4. Supreme Whitestrips – overall color improvement 40% better than Professional in 21 days

D. Adverse Events

1. Localized
 - a. Tooth sensitivity – a little higher with Supreme Whitestrips
 - b. Gingival irritation-lowest with Supreme Whitestrips
 - c. Resolution in 24-48 hours without treatment is typical

VI. J&J Rembrandt Whitening Strips

A. Home Use

- Noticeably whiter teeth in 5 days with once a day 30 minute wear time
- 8% Hydrogen Peroxide vs. 10% HP for Whitestrips Premium
- Longer strip and less slippage than Crest Whitestrips
- Patented dry gel formula keeps peroxide at the treatment site

VII. SALIVA ENHANCERS

A. Novamin (calcium sodium phosphosilicate) by NovaMin Technology Inc. of Alachua, FL.

1. (Omnii Oravive Tooth Revitalizing Paste (Oravive)
2. DenShield Tooth Sensitivity Therapy (Novamin)
3. Butler NuCare Tooth Root Conditioner (Butler)
4. SootheRx Sensitivity Therapy (Omnii)

B. Recaldent (casein phosphopeptide-amorphous calcium phosphate)

1. Sugarless gum – Trident White and Trident for Kids Berry
2. MI paste by GC America – “Comparison of Recaldent Technology” sheet

C. Soluble Calcium Sulfate

1. Arm & Hammer Enamel Care Toothpaste (Church and Dwight)
2. Mentadent Replenishing White (Church and Dwight)

VIII. BLEACHING OF VITAL TEETH

A. Mechanism

1. Hydrogen peroxide is an oxidizing agent which produces free oxygen radicals (unpaired electron).
2. Free oxygen radicals are unstable and electrophilic. They can react with most unsaturated bonds, resulting in disruption of electron conjugation and a change in the absorption energy of the organic molecules in tooth enamel. Simpler molecules that reflect less light are formed which causes whitening
3. Saturation point is reached when only hydrophilic colorless structures exist. Bleaching then results in breakdown of enamel with subsequent tooth brittleness and increased porosity.

B. Chemicals Used for Bleaching

1. Hydrogen peroxide 1.5% - 10% (pH of 3% hydrogen peroxide is 2.7)
2. Carbamide peroxide 10% - 40% (10% CP = 3.6% hydrogen peroxide and 16% CP = 5.76% H₂O₂ -a.k.a. urea peroxide, perhydrol urea, carbamide, carbamide urea
3. Carbamide peroxide products contain either a carbopol, glycerin base, or propylene glycol base.

C. Factors that Affect Bleaching Effectiveness

1. Surface debridement
2. Hydrogen peroxide concentration - highest is 50%
3. Temperature - an increase of 10 degrees centigrade doubles rate of oxidation reaction
4. The pH - slightly acidic pH is ideal for shipping, storage but best oxidation is at pH 9.5 – 10.8
5. Time period - Longer exposure results in greater shade changes
6. Seated environment - increases efficiency of the bleaching process

D. Contraindications for Bleaching Vital Teeth

1. Extremely large pulps which cause sensitivity
2. Hypersensitivity - exposed root surfaces or transient hyperemia due to orthodontic treatment
3. Severe enamel Loss
4. Extensive Restorations - greatest damage to glass ionomers and least to porcelain
5. Pregnancy, lactation, peroxide allergy, latex allergy with power bleaching
6. Transient hypersensitivity with prolonged application of home use gel
7. Hypersensitive reactions or allergic reactions caused by extended exposure to chemicals and appliances such as burning sensation, sore throat, nausea, irritation, or edema.
8. Lack of compliance- either through inability or unwillingness to wear the necessary time

E. Predictors of Bleaching Success

1. Discoloration is fairly light, evenly distributed, and on the surface, not in dentin.
2. Teeth are yellowed as a consequence of aging.
3. Matching large amalgams or crowns is not required.
4. Enamel is fairly heavy and even with no pits, fissures, or grooves.
5. There is no need to change tooth structure.
6. How Long Does it Last?
 - ◆ At 1.5y – 74% are satisfied, at 3y – 64% are satisfied with shade lightening
 - ◆ Minimum “lock out” period of 6 months is recommended for pulp health

BLEACHING MATERIALS

<u>PRODUCT</u>	<u>OTHER ACTIVE INGREDIENTS</u>	<u>TREATMENT TIME</u>	<u># SESSIONS TO COMPLETION</u>	<u>COST of KIT or TREATMENT</u>
<u>Assisted Bleaches</u>				
44% Carbamide Peroxide (Life-Like)	None	20 min	1	\$51
Opalescence XTRA, 35% CP	Carotene	45min-1 h	1-2	\$89.50
<u>Home-Carbamide Peroxide</u>				
10%, 15%, 20%, and 30% Carbamide Peroxide (Lustredent) by Murphy	None	30 min	14	\$59.50
Colgate Platinum Overnight, 10%CP Professional Whitening System	None	6-8h	3-5 nights	-
Contrast P.M. PLUS 10, 15, 20% CP	KNO3	6-8h	7-10 nights	\$21-24
Nite White Excel 2Z, 10,16,22%CP equiv (contains Hydrogen Peroxide)	KNO3, NaF	8-10h	8 nights	\$19.50 starter kit
NUPRO Gold 10, 15% CP	2% NaF	8h	10-14 nights	\$50.00
Opalescence PF, 15, 20%CP	KNO3, NaF	8-10h	7-10 nights	\$26.25
Rembrandt Xtra Comfort, 10,15,22%CP	KNO3	1h	2-4 weeks	\$44.00
White & Brite, 10,16, 22% CP	F in 22%	1-2h	7-12 sessions	\$35-45.00
<u>Home-Hydrogen Peroxide</u>				
Perfecta 3/15 HP, 3% or 4.5% HP	Water-based	30min 2-3/day	14 days	\$59.00
<u>Power Bleaches</u>				
Apollo Secret, 35% HP	Stabilizer	40 min	3	\$125-1500
Hi Lite, 35% HP	Light activator	3-10 min	1-2	\$26.50
Opalescence Xtra, 35% HP	Carotene	45 min- 1h.	1-2	\$89.50
Perfection White, 35% HP	None	15 min.	1-2	\$45.00
PowerGel, 35% HP	Photocatalyst	30 min.	1	\$100.00
QuasarBrite Laser White, 35% HP	NaHydroxide	Less than 1 h	1	\$13-25
Virtuoso XTRA Comfort, 35% HP	KNO3, NaF	20 min	1-2	\$39.95
White Speed, 18% HP, 22% CP	Eugenol, xylitol	30 min	1	\$55.00

IX. . MOUTHWASHES

A. PROPERTIES OF SELECTED OVER-THE-COUNTER MOUTHWASHES

Product (Manufacturer)	Alcohol (%)	PH	Active Ingredients
Advance Breath Care (Arm&Hammer)	15	9.1	Baking Soda, Zince Citrate, Cetylpyridinium Cl
Biotene (Laclede)	0	5.5	Glucose oxidase, lactoperoxidase, lysozyme
Cepacol (SKB)+++	14.5	6.0	Cetylpyridinium chloride 0.05%
Crest Pro-Health Mouthrinse (P&G)	0		Cetylpyridinium chloride 0.07%
Diabeta Rinse	0	6.0	Aloe vera, echinacea, tea tree oil, chamomille
Lavoris Crystal Fresh (Dep)	5	6.0	Citric acid, zinc oxide, sodium hydroxide, zantrate
Listermint Arctic Mint (Pfizer)	0	5.8	Sodium lauryl sulfate, zinc chloride
Oral-B Anti-Plaque Rinse	0/6.6	7.0	Cetylpyridinium chloride 0.05%
Peroxyl (Colgate)	0	3.7	Hydrogen peroxide 1.5%
Rembrandt Premium Whitening Plus (J&J)	0	4.0	.05% NaF, H ₂ O ₂ , castor oil, glycerin for once daily
Rembrandt Whitening with Fluoride (J%J)	0	6.4	0.02% NaF, H ₂ O ₂ , Castor oil for twice daily
Scope with Baking Soda (P&G)	9.9	8.4	Baking Soda, cetylpyridium chloride, domiphen br
Signal (Chesebrough-Ponds)	14.5	-	Sodium lauryl sulfate, sodium chloride
SuperSmile (Robell Res)	0	-	NaMFP, BS, pyrophosphates, calcium peroxide
Targon (Block)	6	5.5	Castor oil, detergents
Therasol (Oratec)	8	-	0.3% C31G, NaF 0.02%, glycerin
Tom's of Maine Natural Cleansing(Colgate)	0	2.7	Vitamin C, aloe vera, glycerin, witch hazel
Tooth and Gum Tonic (Dental Herb Co.)	0	4.7	Oils of peppermint,red thyme,cinnamon,eucalyptus

B. Mouthrinse Product Lines Promoted for Halitosis Treatment

CHEMICAL	MANUFACTURER	PRODUCT LINE/CHARACTERISTICS
COMBINATIONS		
1.) Chlorine Dioxide & Zinc		
TheraBreath	TheraBreath Global www.therabreath.com	Toothpaste, Oral Rinse, Breath Strips, Chewing Gum, Zox Mints, Mouth Sprays
Oxyfresh	Oxyfresh Worldwide Inc. www.oxyfreshww.com	Toothpaste-Flouride/Non-Flouride, Mouth rinse, Dental Gel, Breath Mints, Tongue Scraper, Relief Gel
Breeze	BreezeCare www.breezecare.com	Toothpaste, Breath Strips, Mouthrinse
KFORCE	BreezeCare	Pre-Rinse, Mouthwash, Lozenges
ProFresh	ProFresh www.profresh.com	Mouthwash-0.003%
CloSYSII	Rowpar Pharmaceuticals Inc. www.rowpar.com	Toothpaste, Oral Spray, Oral Rinse
EnFresh	www.enfresh.com	“Trizox” compound, Tongue gel, tongue brush, mouth rinse
BreathGel	International Dental Design Specialist, Inc.	‘ZyClor’ compound, tongue cleaner, mouth rinse
TriOral Professional SmartMouth Retail	TriOral www.trioral.com	Mouth rinse in two 473ml bottles. The green bottle is zinc and the white bottle is chlorine dioxide
SINGLE INGREDIENT		
2.) Zinc Compounds		
BreathRx	Discuss Dental www.discussdental.com	Mouthwash
Arm & Hammer P.M.	Church & Dwight Co.	Toothpaste
TriOral Action	TriOral	Toothpaste, Gum, Mints

3.) Essential Oils		
Listerine	Johnson and Johnson www.listerine.com	Toothpaste, Mouthwash, PocketPaks Pocket Mist, Breath Strips
TheraBreath	TheraBreath Global	Oral Rinse
4.) Triclosan		
Breeze	KFORCE	Mouthwash-5 mL needed
Colgate Total Series	Colgate-Palmolive	Toothpaste
5.) Naturals/Herbals		
Good Breath	Scandinavian Formulas	Soft Gel Tablets
Herbal Toothpaste and Gum Therapy	The Natural Dentist www.thenaturaldentist.com	Toothpaste, Oral rinse
Tooth & Gum Tonic	Dental Herb Company	Oral rinse, dentifrice
Tom's Natural	Tom's of Maine	Mouth rinse, toothpaste
Desert Essence Tea Tree Oil	Country Life	Mouth spray, tea tree ingredient found also found in toothpaste, mouthwash

B. PROPERTIES OF "THERAPEUTIC" MOUTHWASH PRODUCTS

<u>Product</u>	<u>Plaque Reduction</u>	<u>Toxicity</u>	<u>Alcohol</u>	<u>PH</u>	<u>Substantivity</u>
Chlorhexidine (Peridex, Periogard, generics))	High	Low	11.6%	5.6	High
Delmopinol (Impede, OraPharma, Inc.)	Moderate	Low	0%	5.7	Mod
Phenolics (Listerine gold/blue or green, TC)	Moderate	Low	26.9%/21.6%	4.4	Low
Sanguinarine (Viadent Original)	Low-moderate	Low	11.5%	4.5	Low
Quat. Ammon. Comp.++ (Scope/Cepacol,	Low	Low	18%/14%	6.5/6.0	Low
Viadent Advanced Care, Crest Pro Health)	Low-moderate	Low	0%	6.0	Low-Mod
Oxygenating Agents (H ₂ O ₂ /chlorine dioxide)	Low	Unsure	0%	2.7/8.4	Low
Pre-brushing (Plax/New Plax)	Low	low	7.5%/8.5%	8.2	Low

C. THERAPEUTIC MOUTHRINSE: FLUORIDE

TOPICAL/HOME-USE RINSES

Nonprescription

Generally 0.05% NaF designed for 10ml once daily use which exposes teeth to 2.23mg F- per day

Act Restoring-11% alcohol in icy cool mint, cinnamon, vanilla mint, icy spearmint by Chattem
 Act for Kids Fluoride Anti-Cavity Treatment for Kids-BB
 Act Anti-Cavity ETOH-free mint or cinnamon for adults
 Fluorigard Anti-Cavity Dental Rinse, Colgate-Palmolive Co.
 Oral-B Rinse Therapy Anti-Cavity Treatment, Oral-B Lab Fluorinse by Oral-B

NaFrinse Acidulated Oral Rinse 0.05%, Colgate Oral Pharmaceuticals

NaFrinse Neutral Rinse, 0.05%, colgate Oral Pharmaceuticals

Prescription

Generally 0.2% NaF designed for 10ml once weekly use which exposes teeth to about 9mg F- per day

NaFrinse Acidulated Oral Rinse and Systemic Supplement, Orachem Pharmaceuticals
 NaFrinse, 0.05%, Orachem Pharmaceuticals

NaFrinse, 0.2%, Medical Products Laboratories, Oral Pharmaceuticals Div.

Phos-Flur® Oral Rinse Supplement, Cherry, Cinnamon, Grape, Wintergreen, Colgate-Hoyt Laboratories, Div. Of Colgate-Palmolive Co.

PreviDent Dental Rinse, 0.2% Colgate Oral Pharmaceuticals

Pro- Dentx 0.02% Neutral Sodium Fluoride Rinse (Pro-Dentec)

D. Therapeutic Mouthrinse: Anti-Plaque

- i. Efficacy of Crest ProHealth Mouthrinse for Gingivitis Reduction
- ii. Perimed (Olin) – anti-plaque mouthwash for once daily use or irrigation
 Ingredients: 5% PV-I and 1.5% Hydrogen Peroxide

- iii. Prevention (7L Corp) – anti-plaque mouthwash for Ortho, Perio, and General Use
 Ingredients: SLS, Sodium Citrate, Zinc Chloride, Hydrogen Peroxide
 Directions: Rinse with 10ml. 1 to 3 times daily. PH of General Use = 4.3

- iv. Oxyfresh (Oxyfresh USA) – toothpaste and mouthwash for halitosis
CloSys II mouthrinse and Closys II toothpaste (Rowpar Pharmaceuticals)
ProxiPure (Dentist Preferred Inc., 1.800.997.7694) – contains chlorophyll
 Ingredients: stabilized chlorine dioxide (Purogene) < pH = 8.4-9.2

- v. Advanced Formula Plax Pre-brushing Rinse (Pfizer) – physical removal of plaque
 Ingredients: sodium lauryl sulfate, glycerin, 8% alcohol, pH = 8.2
 Directions: rinse with 15ml twice daily for 30 seconds before brushing
 - 1. Studies showing positive results
 - 2. Studies showing negative results

- vi. Listerine Antiseptic (J&J) – ADA/CDA accepted anti-plaque and gingivitis
 Ingredients: menthol, methyl salicylate, eucalyptol, thymol, 21.6% ETOH, TC contains ZnCl
 Directions: Rinse with 20ml twice daily for 30 seconds, pH = 4.2
LISTERINE WHITENING – 2% hydrogen peroxide and 8% alcohol, no essential oils
LISTERINE SMART RINSE – alcohol free with 0.01% fluoride for use in age 6y and up with a dose of 10ml for 30 seconds twice a day. Contains dyes for plaque disclosing in the sink

- vii. Chlorhexidine 0.12% [Peridex (Omnii)], [Periogard (CP)], [Chlorhexidine 0.12% rinse (Teva or Barre)] – ADA/CDA accepted anti-plaque and gingivitis
 The standard for comparison for plaque and gingivitis reduction.
 Ingredients: Chlorhexidine gluconate 0.12%, 11.6% ETOH, pH =5.6
 Directions: Rinse with 15ml twice daily. Foaming agents will inactivate chlorhexidine.
 Advantages: Substantivity, lack of toxicity, broad spectrum of antimicrobial activity
 Disadvantages: Staining, increased calculus formation, alcohol content, taste, unstable in toothpaste due to inactivation by anionic surfactants such as SLS
Chlorhexidine 0.12% alcohol free (Sunstar Americas – only available from dental offices)

IX. Topical Fluoride Gels for Home Application

- 1. General Prescribing Guidelines for Topical Fluoride Gels
 - a. Stannous Fluoride: products have the same fluoride ion content as regular fluoride toothpaste (1000ppm). However, the tin ion in SnF₂ binds to plaque allowing the fluoride/tin compound to exert anti-strep mutans activity for up to 8 hours. The primary usefulness is in fully banded ortho or overdenture abutment patients with gingivitis or for generalized desensitization. Do not use in xerostomic patients due to excessive staining. Do not use for remineralization or in patients prone to root caries. ADA ACCEPTED .04% SnF₂ GELS: Activus(C-P), Alpha-Dent(Alphadental), Easy-Gel(Du-More), Gel-Kam(C-P), Gel-Tin(Young), Just for Kids and Omnii Gel (Omnii), Perfect Choice(Challenge), Plak Smacker(Plak Smacker), Pro-Dentx(Pro-Dentec), Schein Home Care (Henry Schein), Super-Dent(Cartiste Labs)

 - b. Acidulated Phosphate Fluoride products have five times the fluoride ion concentration of regular fluoride toothpaste. The active fluoride compound in APF is NaF. The addition of the phosphoric acid promotes fluoride uptake by reaching the pH threshold for demineralization. Long-term fluoride retention in enamel is probably the

most optimal with APF. Initial uptake is no better for APF than for neutral NaF and the great majority of fluoride is taken up in enamel during the first one minute of exposure. Because the pH of home use APF gel is 5.6, it should not be repeatedly applied to porcelain or glass ionomer surfaces as the material may acid etch and become rough. ADA accepted 1.1% APF for Home use: Thera – Flur Gel Drops (C-P

c. Sodium Fluoride products have five times the fluoride ion concentration of regular fluoride toothpaste. Uptake into demineralized lesions is very rapid. Neutral NaF products are useful for patients who need remineralization but cannot tolerate the acidic pH of APF due to sensitive oral tissues, traumatic soft tissue lesions, or the presence of porcelain or glass ionomer restorative materials. Neutral 5000 ppm NaF gels are the products of choice to avoid stain, irritation, and to maximize remineralization. ADA ACCEPTED 1.1% NaF GELS: NeutraCare (Oral-B), Prevident 5000 gel (Colgate), Thera-Flur-N Gel Drops (Colgate Oral Pharmaceuticals)

2. PRESCRIPTION EXAMPLES

Rampant Caries or Head and Neck Radiation with Plastic Custom Mouth Trays

RX: Thera-Flur-N 0.5% Neutral NaF Gel (Colgate Oral Pharmaceuticals)
DISP: 24ml
SIG: Apply thin film to inner surface of trays and hold on clean, dry teeth 5-6 minutes daily. Spit the excess. Nothing by mouth for 30 minutes afterward.

Rampant Caries or Root Caries by Brush on Application

RX: Prevident 1.1% NaF Gel or NeutraCare 1.1% NaF (both are 0.5% fluoride ion)
DISP: 56ml (Prevident) or 125ml (Karigel-M)
SIG: Brush with pea-sized amount twice daily after cleaning teeth. Spit the excess. Nothing by mouth for 30 minutes afterward.

Rampant Caries or Root Caries by a ONE STEP Brush on Method


RX: Prevident 5000 Plus Dentifrice or Control Rx (Omnii) or Fluoridex (Discus)
DISP: 51 grams
SIG: Brush with pea-sized amount twice daily. Spit the excess. NPO 30 minutes afterward.

Gingivitis Reduction in Fully Banded Orthodontics Patients

RX: Gel-Kam 0.4% or Omni-Gel 0.4% stannous fluoride 1000 ppm gel
DISP: 210 grams (Gel-Kam)
SIG: Brush with one inch strip twice daily after cleaning teeth. Spit the excess. NPO 30 minutes afterward.

Gingivitis Reduction around overdenture Abutment Teeth

RX: Gel-Kam 0.4% or Stop-Gel 0.4% stannous fluoride 1000 ppm gel
SIG: Brush around abutment teeth with pea-sized amount or place one drop in each depression of denture daily after cleaning. NPO 30 minutes afterward.

COMPARISON of RECALDENT™ (CPP-ACP) TECHNOLOGY with ACP, NOVAMIN® & SENSISTAT®				
Products	RECALDENT™ (CPP-ACP)	Amorphous Calcium Phosphate (ACP)	NovaMin®*	SensiStat®*
Active Ingredients	Casein Phosphopeptides (CPP) & Amorphous Calcium Phosphate (ACP). Casein Phosphopeptides (CPP) are peptides derived from the milk protein casein that are complexed with calcium (Ca) and phosphate (PO ₄). In this complex, the CPP maintains the Ca & PO ₄ in an amorphous form (ACP). The milk derived peptide containing amorphous Ca & PO ₄ is the driving mechanism that binds to plaque and to the tooth surface. The phosphopeptides will make Ca & PO ₄ available for effective remineralization.	ACP is an inorganic Amorphous Calcium Phosphate, made by combining soluble salts of calcium (Ca) and phosphate (PO ₄). Two phase system containing, Ca in one part and PO ₄ in another. When mixed together, they react to form an Amorphous Calcium Phosphate (ACP) material that precipitates onto the tooth surface.	NovaMin is composed of calcium, phosphorus, sodium and silica. Its chemical name is "Calcium Sodium Phosphosilicate".	SensiStat contains arginine, a common amino acid found in saliva, in combination with calcium and bicarbonate/ carbonate to form protection.
How Product Works	RECALDENT™ (CPP-ACP) utilizes peptides derived from the milk protein, casein to maintain Ca & PO ₄ in an amorphous form (ACP). The CPP will bind to surfaces such as plaque and soft tissue providing a reservoir of bioavailable Ca & PO ₄ , at the surface of the tooth without precipitation. By providing bioavailable Ca & PO ₄ , the RECALDENT™ (CPP-ACP) Technology makes the Ca & PO ₄ more effective for remineralization. Because the CPP prevents the transformation of Ca & PO ₄ to an insoluble form, RECALDENT™ (CPP-ACP) can reduce the formation of calculus. RECALDENT™ (CPP-ACP) delivers Ca & PO ₄ to tooth surfaces, plaque and surrounding soft tissue. The Amorphous Calcium Phosphate (ACP) is released during acidic challenges. Stabilization of ACP by the CPP ensures the delivery of Ca & PO ₄ ions into the tooth structure before they crystallize.	Amorphous Ca & PO ₄ is highly soluble so continuous acidic attacks will rapidly wash the Ca & PO ₄ away. ACP in an "unprotected mode" prevents the Ca & PO ₄ from being bioavailable for remineralization. Its presence due to the local concentration will lead to the formation of calculus and precipitation. Since ACP is not protected and has no "delivery system" it has limited or lower substantivity. ACP is not bioavailable after the product, whether it is toothpaste or gel, is rinsed away or removed.	When NovaMin comes in contact with saliva and water, it reacts and releases Ca & PO ₄ ions. The Ca & PO ₄ ions are protected by glass and the glass particles need to be trapped for the Ca & PO ₄ to be localized. The glass particles along with the Ca & PO ₄ do not stick to the dentition and soft tissue therefore, it has a tendency to wash away reducing substantivity.	The arginine complex binds to the tooth surface and allows the calcium carbonate to slowly dissolve and release calcium and phosphorous.
Peer Review Studies	<ul style="list-style-type: none"> 90 + studies in peer review journals on RECALDENT™ (CPP-ACP) Technology Additional aids to the remineralization of tooth structure. E. C. Reynolds, L.J. Walsh. Textbook: Preservation and Restoration of Teeth – 2nd Edition 2005, p 111-118. 	<ul style="list-style-type: none"> Amorphous Calcium Phosphate is licensed by ADA Foundation A few peer review studies by ADA Foundation No method of activation 	<ul style="list-style-type: none"> 20 – 30 peer review studies 	<ul style="list-style-type: none"> Advertisement claims only Little peer-review evidence
Clinical Uses	<ul style="list-style-type: none"> Strengthens tooth enamel with the release of Ca and PO₄, promoting remineralization of the tooth by increasing the hydroxyapatite Reduces sensitivity by occluding dentinal tubules Reduces dentinal hypersensitivity especially after bleaching, scaling & root planing Buffers plaque acid Reduces decalcification in orthodontic treatment Repairs 'white spot' lesions Reduces erosion 	<ul style="list-style-type: none"> Reduces patient sensitivity and restores enamel luster ACP releases Ca & PO₄ ions reducing micro-leakage related decay 	<ul style="list-style-type: none"> Only focuses on relief of root surface hypersensitivity Physically occludes dentin tubules to protect the nerve and prevent pain 	<ul style="list-style-type: none"> Sealing dentinal tubules will stop the ability of fluid movement in the tubules to elicit pain
What Products Contain This	<ul style="list-style-type: none"> PROSPEC™ MI Paste™ <ul style="list-style-type: none"> GC America, Inc. Trident White®* Gum <ul style="list-style-type: none"> Cadbury Adams USA 	<ul style="list-style-type: none"> ARM & Hammer®* Enamel Care®* - Liquid Calcium®* Mentadent®* Replenishing White™* - Church & Dwight Co. Inc. Zoom2®* ACP, Day White ACP, Nite White ACP - Discus Dental®* Aegis®* Products with ACP - Bosworth Company 	<ul style="list-style-type: none"> NuCare Prophy Paste - Sunstar Butler SootheRx™* - Omnii Oral Pharmaceuticals DenShield Oravive™* 	<ul style="list-style-type: none"> ProClude®* DenClude™* - Ortek

Revised 3/15/06 ams

XEROSTOMIA PATIENT MANAGEMENT

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I. EFFECTS OF DRUGS ON THE SALIVARY GLANDS

A. AUTONOMIC INNERVATION OF SALIVARY GLANDS

BLOOD VESSELS:

Sympathetic alpha = constriction
Parasympathetic response = dilation

SALIVARY GLANDS:

Sympathetic alpha & beta = viscous secretions, amylase secretion
Parasympathetic response = profuse, watery secretions

B. PTYALISM / SIALORRHEA

alprazolam (Xanax [®])	clonidine (Catapres)	levodopa (Sinemet)	clozapine (Clozaril)
pilocarpine (Isopto-Carpine)	lithium (Eskalith)	pentoxifylline (Trental)	haloperidol (Haldol)
lorazepam (Ativan)	reserpine (Serpasil)	valproic acid (Depakene)	risperidone (Risperdal)
tacrine (Cognex)	bethanechol (Urecholine)	donepezil (Aricept)	galantamine (Reminyl)

C. XEROSTOMIA

i) **Mechanism of xerostomic drug action:**

- 1) Interference with transmission at the parasympathetic neuro-effector junction
- 2) Interference with transmission at autonomic ganglia
- 3) Actions at the adrenergic neuro-effector junction
- 4) Depression of central connections of autonomic nervous system = CNS depressants

ii) **Clinical symptoms of xerostomia:**

- generalized burning sensation in the mouth
- sore, burning tongue
- generalized oral soreness
- repeated oral abrasions & ulcerations
(especially associated with denture wearing)
- difficulty swallowing or speaking due to dry tissues
- swelling of the face
- disturbed sleep patterns

iii) **Clinical signs of xerostomia:**

- generalized mucosal inflammation
- mucosal atrophy
- fissuring of the tongue
- predisposition to ulceration
- infection by *Candida albicans* & angular cheilitis
- retrograde infection of the salivary glands
- increased rate of dental caries (especially root caries)
- increased plaque formation & accumulation

iv) **Effects on quality of life:**

- increased incidence of oral candidosis
- increased caries and periodontal disease
- decreased nutritional intake
- reduced denture wearing time
- burning mouth, sore tongue, discomfort
- decreased compliance with medications

D. DRUGS WHICH FREQUENTLY CAUSE XEROSTOMIA:***ANTICHOLINERGICS & ANTIPARKINSONIAN AGENTS***

methantheline bromide (Banthine)	dicyclomine (Bentyl)	trihexyphenidyl (Artane)
benztropine mesylate (Cogentin)	tolterodine (Detrol)	oxybutynin (Ditropan)

ANTIDEPRESSANTS

amitriptyline (Elavil)	SSRI's & others	bupropion (Wellbutrin)
trazodone (Desyrel)	MAOI's	ALL TCAs

SYSTEMIC ANTIHISTAMINES

diphenhydramine (Benadryl)	clemastine (Tavist)	hydroxyzine (Atarax)
chlorpheniramine (Chlor-Trimeton)	triprolidine (Actifed)	cetirizine (Zyrtec-OTC)

ANTIPSYCHOTICS

chlorpromazine (Thorazine)	thioridazine (Mellaril)	prochlorperazine (Compazine)
haloperidol (Haldol)	thiothixene (Navane)	trifluoperazine (Stelazine)

ANTIHYPERTENSIVES

ACE INHIBITORS	BETA BLOCKERS	ALPHA BLOCKERS
ARBs	guanethidine (Ismelin)	reserpine (Serpasil)

CNS STIMULANTS

diethylpropion (Tenuate)	amphetamines	phentermine (Fastin)
	methylphenidate (Ritalin, Concerta)	pseudoephedrine (Sudafed)

DIURETICS

chlorthalidone (Hygroton)	ALL THIAZIDES	ALL LOOP DIURETICS
K+ SPARING AGENTS	carbonic anhydrase inhibitors	

MISCELLANEOUS AGENTS

muscle relaxants	systemic bronchodilators	OPIOID ANALGESICS
	atropinics	hypotensive agents

E. OTHER CONDITIONS ASSOCIATED WITH XEROSTOMIA

- AIDS/HIV
- Bone Marrow Transplantation
- Chronic Active Hepatitis
- Radiation Therapy
- Primary Biliary Cirrhosis
- Vasculitis
- Graft vs. Host Disease
- Renal Dialysis
- Anxiety or Depression
- Diabetes Mellitus

II. MANAGEMENT OF THE XEROSTOMIC PATIENT**A. PATIENT COUNSELING -**

- Many patients can be successfully managed via lifestyle/habit changes alone
- the back page contains a patient information handout that can be Xeroxed
 - all patients will benefit from the suggestions below:

- Sip cool water throughout the day, let ice chips melt in mouth (don't chew ice!)
 - most people do not drink enough fluids and this often contributes to the problem
- Try drinking milk with meals
 - whole or 2% milk has moisturizing properties to help the patient swallow a bolus of food
- Use a cool air humidifier in the bedroom - clean and change water daily
 - start the humidifier an hour or two before bedtime and let it run through the night
 - *this is of benefit for people who already have a humidifier in their furnace as well*
- Avoid alcohol and alcohol-containing mouthwashes
 - alcohol has a drying effect and can also irritate the tissues
 - Biotene mouthwash is an excellent alcohol free wash
 - *Many patients get into a vicious cycle of halitosis and mouthwashes*
- Restrict caffeine intake - as it also has a drying effect, use caffeine-free tea, coffee and sodas
 - *I usually recommend that pts. decrease caffeine intake by no more than 25% per week to avoid the pounding headache that accompanies withdrawal*
 - *this is crucial for management of the xerostomic patient*
- Use sugar-free candy, gum and beverages
 - acidic candies (and foods) can cause a sore mouth
 - warn them that excessive intake of sorbitol based candies causes diarrhea!!
- Use hydrous lanolin USP (Lansinoh) on lips frequently during the day and especially at bedtime
- If possible, sleep on your side in order to reduce mouth breathing
- Recurrent yeast infections
 - may require chronic prophylaxis
 - *rarely "resistant" infections – usually reinfections*
 - *consider alcohol-free chlorhexidine rinse (compounded by pharmacist or from Butler)*

B. SALIVA SUBSTITUTES (* denotes ADA acceptance)

– all are OTC products and individual patient acceptance varies widely

PRODUCT (MFR)	INGREDIENTS	DISPENSED/SOLD	PT. COST
Mouthkote (Parnell)	xylitol, sorbitol***, yerba santa, citric acid, ascorbic acid, sodium benzoate, saccharin	8 oz pump spray	\$9.50
Oasis Mouthwash and Mouth Spray (GlaxoSmithKline-Consumer Healthcare)	Water, glycerin, sorbitol***, poloxamer 338, castor oil, cellulose gum cetylpyridinium chloride (CPC)	16oz bottle mouthwash 1oz spray bottle	\$5.99 \$4.99
Oral Balance Moisturizing Gel or Liquid (Laclede)	glucose oxidase enzyme system, xylitol, hydroxyethyl cellulose, aloe vera, K thiocynate	42g (1.5 oz) tube of gel 45ml (1.5oz) squeeze bottle	\$7.25 \$7.25
Saliva Substitute* (Roxane)	Sorbitol***, methylparabens, NaCMC,	120ml (4 oz) squeeze bottle	\$5.50
Salivart Synthetic Saliva* (Gebauer Co.)	NaCMC, sorbitol***, NaCl, dibasic potassium phosphate, Kcl, CaCl ₂ , MgCl ₂	75 gram can with Nitrogen propellant	\$9.50
Stoppers4 Dry Mouth Spray (Woodridge)	Water, glycerin, xylitol, hydroxyethylcellulose, lysozyme, lactoferrin, glucose oxidase	1oz spray bottle	\$6.09

➤ V= viscosity agent = thickener ➤ P= preservative ➤ M= miscellaneous agents - buffers, flavoring

***Sorbitol - non-cariogenic sugar alcohol - chronic use in presence of decreased salivary flow may increase *Strep mutans*

Oralbalance® (Laclede) – Moisturizing gel in 1.5 oz tube, Moisturizing liquid in 1.5oz squeeze bottle

- moisturizing gel, especially useful at nighttime, liquid is for daytime use
- spread on tissues and under dentures as needed for long-lasting effects
- high patient acceptance, slightly sweet flavor, beneficial ingredients

XEROSTOMIA (Dry Mouth) PATIENT INFORMATION HANDOUT

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DEFINITION:

Xerostomia (pronounced “zero-sto’me-ah”) is the medical word for dry mouth due to decreased or absent saliva. This problem is quite common and is caused by a variety of medical conditions and medications.

HELPFUL HINTS:

- Sip cool water throughout the day, let ice chips melt in mouth (don’t chew ice!)
 - most people do not drink enough fluids and this will contribute to a dry mouth
- Try drinking milk with meals
 - milk has moisturizing properties and helps some people to swallow their food
- Restrict caffeine intake – caffeine is a MAJOR cause of dry mouth. Use caffeine-free tea, coffee and sodas
 - eliminating caffeine from your diet will have a significant effect on the symptoms of dry mouth
- Use a cool air humidifier in the bedroom - clean and change water daily
 - start the humidifier an hour or two before bedtime and let it run through the night
- Avoid alcohol and alcohol-containing mouthwashes (read labels of commercial products carefully)
 - alcohol has a drying effect and can also irritate the tissues
- Use sugar-free candy, gum and beverages, look for products that contain Xylitol (a sweetener that does not cause cavities)
 - overuse of acidic candies and foods can cause a sore mouth
 - chewing gum will stimulate saliva flow
- Use hydrous lanolin USP (Lansinoh) on lips frequently during the day and especially at bedtime
- If possible, sleep on your side in order to reduce mouth breathing
- See your dentist frequently
 - people with dry mouth are more prone to oral yeast infections as well as dental cavities
 - report any unusual oral soreness or burning sensations to your dentist
 - excellent oral hygiene is necessary to prevent cavities and gum disease

COMMERCIAL SALIVA SUBSTITUTES, STIMULANTS & MOISTURIZING GELS

The products listed below are available without a prescription and can be found or ordered from many pharmacies. These products are very helpful in alleviating the symptoms of dry mouth. They can be used as often as needed, do not interfere or react with other prescription drugs and do not have side-effects.

TABLETS:

- **SalivaSure® Tablets (formerly called Salix SST® by Scandinavian Formulas, Inc.) – 90 ct. bottle \$7.95**
 - to stimulate natural saliva flow, dissolve one tablet slowly under tongue up to every hour as needed
 - highly recommended, will not cause cavities or sore mouth
 - easy to carry, mild mint flavor, no drug interactions
 - may be difficult to obtain but ask your pharmacist to order the product

GEL:

- **Oral Balance® (Laclede) - 1.5 oz tube**
 - moisturizing water based gel, especially useful at nighttime
 - spread on tissues and under dentures as needed for long-lasting effects

TOOTHPASTE:

- **Biotene Toothpaste® (Laclede) – 4.5 oz tube**
 - mild tasting, gently cleaning toothpaste in blue box, contains MFP fluoride
 - also available in a gel formulation in a green box, contains MFP fluoride

SALIVA SUBSTITUTE LIQUID:

- **Saliva Substitute® -4oz(Roxane) or Oasis -1oz (GSK) mouthspray**
- **Oral Balance Dry Mouth Moisturizing Liquid-1.5oz(Laclede)**
- **Stoppers4 Dry Mouth Spray -1oz(Woodridge Inc.)**