DEPARTMENT OF THE AIR FORCE
WILFORD HALL MEDICAL CENTER (AETC)

5 FEB 1996

MEMORANDUM FOR USAF Preventive Dentistry Officers

FROM: Dunn Dental Clinic/DSB
1615 Truemper Street
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SUBJECT: Preventive Dentistry Update #15

1. **USAF Preventive Dentistry Course**. As you may know, this course alternates annually with the USAF Dental Infection and Occupational Safety Course. In 1995 we split the quota so that both courses could be held. However, as of this date, and for a number of reasons, there will not be a Preventive Dentistry Course in 1996.

2. **Water Fluoridation**. Many bases are experiencing a variety of problems with fluoridation of their water supplies. They include, but are no means limited to: antiquated systems that break down periodically; systems that cannot be repaired due to unavailability of parts or a reluctance by Civil Engineering to fund needed repairs or replacement; an almost cavalier attitude of non-dental personnel regarding the need for fluoridation and/or close monitoring; or a combination of the above.

AFR 161-44 provided very definite guidelines as to responsibilities and procedures in this area, but it has been replaced by AFI 48-119 which, like most Air Force Instructions, is not directive by nature. I'm not sure if the following information is part of AFI 48-119, but its essence remains valid.

Fluoride limits in drinking water are based on the annual average of maximum daily air temperatures in a given community. In colder climates, fluoride levels are adjusted upward from the so-called optimum of 1 ppm to make up for the decreased intake of water. Conversely, the levels are adjusted downward in hot climates. This is reflected in the following table (Table 5-2), which was taken from AFR 161-44.

Annual Average of Maximum Daily Air Temperature F	**Maximum Fluoride Level in ppm**	**Recommended Control Limits for Fluoridation (Fluoride Concentrations in ppm)**		
		Lower	**Optimum**	**Upper**
53.7 and below	2.4	0.9	1.2	1.7
53.8 - 58.3	2.2	0.8	1.1	1.5
58.4 - 63.8	2.0	0.8	1.0	1.3
63.9 - 70.7	1.8	0.7	0.9	1.2
70.8 - 79.2	1.6	0.7	0.8	1.0
79.3 - 90.5	1.4	0.6	0.7	0.8

Even in the coldest of climates, while the maximum fluoride level is 2.4 ppm, the upper control limit is 1.7. This provides a margin of safety and guards against fluorosis. While the optimum of 1.0 ppm was

established almost 40 years ago as that level which provides maximum caries prevention at minimum to no fluorosis risk, that level is still recommended today. The American Dental Association, within the past two years, re-validated its position on this issue.

AFR 161-44 stated that "Although fluorides may be beneficial in preventing dental caries, if the fluoride concentration rises above the recommended limits, it may produce objectionable fluorosis. Therefore, the levels must not exceed the upper fluoridation concentration in table 5-2, when fluoride is added to the water." It also says "Fluoride should be applied to water supplied to fixed installations when the natural fluoride of the water is below the level necessary to prevent dental caries and when the system serves an appreciable number of children."

Unfortunately, AFI 48-119 offers no specific information regarding fluoridation. Air Force Occupational and Environmental Safety and Health Standard 48-6, Safe Drinking Water (DRAFT) reiterates the second quote from AFR 161-44, but leaves out the table. AFI 32-1067 says "to fluoridate water supplies when necessary to comply with federal, state and local requirements." I'm told the above table may become part of the latter instruction.

Regarding fluorosis, remember the guidelines for fluoride supplementation changed last year. The revised guidelines can be found in Preventive Dentistry Update #14, dated 1 Dec 1994. Be careful when you prescribe supplements. Verify that the child is not also receiving vitamins with fluoride from his/her pediatrician. Double dosing can result in unwanted fluorosis.

3. **Caries Diagnosis and Assessment**. Recently the American Dental Association published a special supplement devoted to caries diagnosis and risk assessment. The feature article was "Treating Caries as an Infectious Disease." It also included a series of tables with intervention recommendations on educational reinforcement and recall; sealants; fluoride supplementation; professionally applied APF and sodium fluoride products; fluoride dentifrices; home fluoride gels or rinses; and antimicrobial mouthrinses.

While I recommend you read the entire supplement, here are a few bullets that are food for thought:

- The profession and the public are shifting from restorative dentistry to prevention and health promotion.
- Growing evidence now supports long-term benefits of preserving tooth structure with non-invasive interventions like fluorides, sealants, chemotherapeutic agents and conservative restorations.
- Knowing which patients will benefit from specific approaches instead of restorative treatment is an emerging science.
- The process of demineralization will progress, regress or remain unchanged depending on nutritional and oral health counseling, sealants, managing reduced salivary function, fluoride therapy and the use of antimicrobial agents.
- Virtually all restorations have a limited clinical lifetime. Enamel and cementum serve as reservoirs of fluoride. The loss of tooth structure through restoration and tooth loss actually reduces the reservoir potential for fluoride release intraorally. *The decision to surgically remove tooth structure when a lesion is at a potentially reversible stage is being questioned increasingly in the literature.*
- Individualized "risk-based" approaches to caries prevention are scientifically justified given current caries patterns.
- The law of diminishing returns applies: those who have experienced little or no decay do not always realize substantial benefit from multiple preventive approaches.
- Fluoride supplements should not be prescribed for children without a specific determination of fluoride levels existing in their drinking water.

- Risk assessment is not a perfect science.
- Caries diagnosis includes: visual exam of air-dried teeth, including fiber optic transillumination; radiographs; previous caries history; bacteriologic assessment and monitoring.
- Three general categories of caries exist: questionable caries, incipient caries and frank caries.
- *Restoration of "sticky fissures" in the absence of other factors such as staining, friable enamel or translucent undermining of enamel may cause many non-carious teeth to be unnecessarily restored.*
- *Traditional probing with a sharp explorer has come into question as the ultimate determinant of caries activity. The exclusive use of a "catch" to diagnose caries in pits and fissures should be discontinued.* Non-cavitated lesions can become cavitated through pressure from the explorer. An explorer can also transfer cariogenic bacteria from one tooth surface to another.
- Caries will not progress under a properly placed and intact sealant.
- *Enamel-only lesions are indicative of the need to intervene to prevent these early lesions from progressing to frank cavities that require restoration.*
- If a year has passed without progression of caries or new caries activity, the patient can be considered to be in the low risk category

4. **Changes to Enlisted Training**. There may be more changes on the horizon that will make base level prophy training programs easier to manage, raise the quality of patient care across the Air Force Dental Service, and provide interested and motivated enlisted personnel an opportunity to earn a dental hygiene degree. Although not written in stone yet, indications are that some or all of these improvements are just around the corner. Lt Col Ben Young, currently director of the Periodontal Therapist Course, has been working very hard to establish parameters, negotiate agreements and secure approval to proceed. In a nutshell, individuals would be required to successfully complete a base level prophy training program. This program would be a self-contained, exportable course developed by personnel at both Lackland AFB and the 381st Training Squadron at Sheppard AFB that would standardize training materials and tests. A resident Advanced Oral Hygiene Course, very similar to the present Periodontal Therapist Course, would be available as the next step. Graduates of this four week course would return to their home base and work under the direct proctorship of a dentist for the next 11 months. At some point in the future, based on the totality of 3-level training, 5- and 7-level upgrades, completion of both base-level and in-resident training, experience chairside, and any college courses that the individual might need to take, a dental hygiene degree would then be possible. Of course, challenging and passing a hygiene board will be a necessity, and agreements with dental hygiene schools all over the country are part of the planning Lt Col Young is doing. Keep your eyes and ears open for more on this subject.

5. **A Personal Note**. After 22 years of active duty, I'm turning in the blue suit and retiring this summer. (By the way, I have no firm information as to my successor, at least for the short term.) I've enjoyed my time as your special consultant and hope I've been of some help over the past seven years. As we in the dental profession have known for decades, and our medical colleagues are only now learning....An ounce of prevention really is worth a pound of cure. Through the efforts of pioneers like Arden Christen, Al Jerman, Gene Muth, Paul Park, and Bruce Matis, the Air Force Dental Service has always been on the cutting edge of prevention. I hope all of you will keep that legacy alive and well. Good-bye and good luck in your careers, wherever they make take you.

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