Alternative Dental Hygiene Practice: Access, Cost, and Harm Considerations

A REVIEW PREPARED FOR THE COLLEGE OF DENTAL HYGIENISTS OF ONTARIO (APRIL 5, 2001)

by D.W. Lewis, DDS, DDPH, MScD, FRCD(C) Professor Emeritus, University of Toronto

ABSTRACT

This review summarizes the accessibility, cost, and safety issues for patients when dental hygienists provide self-initiated dental hygiene care unsupervised by dentists. In considering these issues, it is important to recognize that demographic and dental disease changes will continue to greatly increase the public's need for exactly the kinds of preventive and maintenance dental services that dental hygienists primarily render. Despite deficiences in the amount and type of data needed in the published literature to give high-quality evidence, sufficient information is available to suggest the following conclusions: Unsupervised dental hygiene care in non-traditional practice settings will increase public access, notably for special groups currently with poor access, both to needed preventive dental hygiene services and, by increased patient referrals, to dentists' therapeutic services. This unsupervised dental hygiene care can be provided at lower cost than this same care in supervised dental practices. Unsupervised dental hygiene practice does not increase risk to the health of the public nor pose undue harm to patients.

INTRODUCTION

In 1984, Bader *et al.*(1984) expressed surprise at the paucity of empirical data available from the analysis of traditional dental hygiene practice records in view of the then-active discussions about the changing responsibilities of dental hygienists in oral health care and the development of new forms of dental hygiene practice. Five years later, in 1989, the prestigious Institute of Medicine in Washington, D.C., in the part of its report on proposed changes to the regulations governing numerous allied health professions, also noted the lack of published research on the accessibility, risk, quality, and cost associated with these changes. Interestingly, the report singled out the negative consequences this lack had for dental hygiene:

Rhetoric and political power frequently substitute for evidence and rational decision making…. One of the clearest examples of this problem is the case of dental hygiene services (Institute of Medicine 1989).

Purpose

Based on published literature, this review summarizes the accessibility, cost, and patient safety (harm) implications when self-initiated dental hygiene care, unsupervised by dentists, is provided by dental hygienists in a variety of alternative practice settings rather than in dentists' offices.

Currently in Ontario, there is conflict between dentistry and dental hygiene—both self-regulating professions—whether dental hygienists need an order from a dentist before they perform certain dental services (e.g., scaling, root planing, curettage). Simply put, the issue is whether these acts can be self-initiated by dental hygienists or whether they must first be subjected to a specified level of dentist supervision (the "order"). The order requirement and the divergent views about it have been thoroughly evaluated elsewhere (Ontario 1996) and will not be reviewed here. However, it would be disingenuous not to mention this dispute because of its underlying relevance to the topics of this report.

Alternative practice

Practice settings where dental hygienists would provide the self-initiated periodontal services mentioned above, along with other preventive dental hygiene services and health promotion, could take place in traditional dental offices involving new contractual arrangements between dentists and dental hygienists. However, it is envisaged that most self-initiated dental hygiene care would be provided in a wide variety of alternative or non-traditional practice set-

tings. These could include care provision to seniors and other special groups in long-term care facilities, institutions, and community centers (Johnson 1998). Some fixed and mobile dental hygiene practices serving a broad range of patients have already been established by dental hygienists in Canada, although none of them is truly independent of some level of dentist supervision or direct contact. Descriptive examples of these practices from British Columbia and Ontario can be found in various references (Heisterman 1998; Brodie 1996; Moore 1999; Perry 1999; Spencer 1997). (From reading these, it appears that dental hygienists working in British Columbia have fewer constraints imposed by dentistry on their delivery of a full range of dental hygiene services than have Ontario dental hygienists.)

The establishment of independent dental hygiene practices, by probably a very small number of dental hygienists, mainly to serve the dental hygiene care needs of the general public in selected locations, may also occur as has happened in a number of American states, e.g., California, Colorado, and Washington. Despite this possible change in future dental hygiene practice arrangements, it is expected that most dental hygienists will continue their employment in traditional dentist offices (Clovis 1999).

Changing disease and treatment patterns

Demographic and epidemiologic changes have influenced, and will continue to influence, the oral health status of persons in North America and the kinds of evidence-based preventive and therapeutic services they need (Ismail and Lewis 1993; Lewis and Ismail 1995). People are living longer; most have fewer and less severe carious teeth and greater and longer retention of their natural teeth (Ismail and Lewis 1993; Lewis and Ismail 1995; Leake 2000; United States 2000). This has resulted in less edentulism, even in older adults, but greater potential for more gingivitis and mild periodontitis associated with these retained teeth.

Not suprisingly, these changes in disease prevalence and tooth retention have resulted in changes to the mix of dental services being provided. High percentages of the total dental services to privately insured adult patients (Porter *et al.* 1999; Eklund *et al.* 1997) and to publicly insured seniors in Alberta (Thompson and Lewis 1994) are maintenance in nature, involving preventive services and prophylaxis. And, over time, there have been decreases in the provision of restorations and extractions and increases in preventive services, especially periodontal (Eklund *et al.* 1997; Thompson and Lewis 1994). Based on these epidemiological and service trends, the need for the kind of preventive and health promotion dental services that dental hygienists primarily provide is predicted to increase (Lewis 1989).

Oral health status and care inequities

Despite the foregoing improvements in oral health status and in the dental care services needed and being received by some, inequities in oral health status and access to dental services remain in North America. The Surgeon General of the United States (United States 2000) recently called this the "silent epidemic," whereby the poor, especially children, the elderly, and other marginalized and disadvantaged groups including many elderly residing both at home and in long-term care facilities, have not benefited from the overall improvements in oral health and access to care.

The burden of suffering of such persons has been exacerbated by recent budgetary cutbacks in funding for public dental care programs. Diminished access to care is particularly evident in the growing population of elderly persons in Ontario (Leake 2000). It has been made worse by the past failures of dentists in private practice, despite some good intentions, to provide the elderly with needed dental care outside traditional office settings (Leake 2000; MacIntee *et al.* 1992).

Besides the benefits to be derived from better personal oral hygiene and professional dental prophylaxis that persons experiencing these inequities need, many require restorative and prosthetic dental care from a dentist. The important role that dental hygienists play in helping patients achieve this treatment need is described in the next section.

ACCESS

The inability of private dental practice to meet the needs of special patient groups such as those just described underscores the difference between the terms *availability* and *accessibility*. Dental care may be present in a geographic area—and thus is theoretically available—but may not be accessible to all residents of the area.

ABRÉGÉ

Cette revue résume les questions d'accessibilité, de coût et de sécurité pour les patients lorsque des hygiénistes dentaires offrent de leur propre chef des soins d'hygiène dentaire non supervisés par des dentistes. Lorsqu'on se penche sur ces questions, il est important de reconnaître que les changements démographiques et l'évolution des maladies dentaires vont continuer à augmenter grandement le besoin du public pour le genre de services dentaires qui sont du ressort primordial des hygiénistes dentaires dans les domaines de la prévention et de la maintenance. Malgré que la littérature publiée comporte des lacunes dans la quantité et le genre de données nécessaires pour constituer une preuve de haute qualité, il existe suffisamment d'information pour suggérer les conclusions suivantes : Les soins d'hygiène dentaire non supervisés prodigués dans des milieux de pratique non traditionnels vont accroître l'accessibilité du public à ces services, notamment pour les groupes spéciaux qui souffrent présentement d'une accessibilité réduite, à la fois aux services préventifs nécessaires en hygiène dentaire et, par une augmentation des références de patients, aux services thérapeutiques des dentistes. Ces soins d'hygiène dentaire non supervisés peuvent être prodigués à meilleur coût que ces mêmes soins dans les pratiques dentaires supervisées. La pratique de l'hygiène dentaire non supervisée n'augmente pas le risque auquel serait exposée la santé du public et ne comporte aucun effet iatrogénique chez les patients.

Barriers to accessibility and dental hygiene practice

Many factors, acting alone or in combination, affect accessibility to care: socio-economic status; cultural values; lack of transportation or of flexibility in getting time off work; physical disability or illness; lack of money or dental insurance; inadequate public insurance or programs; and negative attitudes about the importance of oral health and tooth retention (United States 2000).

Dental hygienists working in non-traditional practices could hardly be expected to make more than a small dent in this formidable list of barriers to care. They could, however, possibly provide less expensive preventive care, improve geographic accessibility by increasing the number and convenience of the sites where the care they render is available, and provide education to decrease the negative attitudes of some persons. But their main impact on the reduction of these barriers would result from their taking the full range of dental hygiene services—using mobile or on-site equipment—directly to persons who currently have difficulties and disabilities that prevent them from readily accessing traditional practices. Relative to the expense, the difficulties, and the anxiety created by transporting a patient with mobility problems to the unfamiliar surroundings of a dentist's office, Heisterman (1998) in British Columbia presented a better approach. She has described how even complex, lengthy dental hygiene procedures can be performed successfully in the security of the familiar surroundings of the institution where the patient lives. However, Heisterman, and the other dental hygienists in alternative practices mentioned earlier, regularly refer patients to dentists for care needs beyond the hygienists' scope of practice.

Independent dental hygiene practice

The most extensive documentation of the effect that dental hygienists in alternative practices have on access to care arises from published reports of the experimental demonstration program (1987–1990) involving independent dental hygienists in California (Perry *et al.* 1994, 1997; Freed *et al.* 1997; Kushman *et al.* 1996). The background and design of the research program, plus the legal challenges to it instigated by the California Dental Association, have been well described by Perry *et al.*(1994). They also reported that a similar follow-up study, which took account of the legal technicality that led to the first study's closure, was approved by the appropriate state agency in 1990 and was again underway, as of 1994.

A number of diverse aspects associated with access to care were analyzed in the California project:

1. In the five independent dental hygiene practices that provided relevant data over two years, it was revealed that many patients who were previously low dental users were nevertheless attracted to use the independent dental hygienists. For example, 41 per cent of initial new patients, and 49 per cent of the new patients who entered the program after it had been operating for 18 months, did not currently have or had never previously had a dentist (Perry *et al.* 1997).
2. Eight of the nine independent dental hygiene practices in the study accepted Medicaid patients, whereas earlier surveys of California dentists had revealed that very few dentists would accept Medicaid patients (Kushman *et al.* 1996).
3. Relative to the initial group of new patients, there was a shift suggestive of broader future access since the group of new patients entering after 18 months had different demographic characteristics, more like persons who historically in the United States have lower utilization of dental services (more non-whites and lower education and income levels) (Perry *et al.* 1997).
4. The recall potential of extant patients for future dental hygiene care was enhanced by the finding that 98 per cent of patients were satisfied with the care they had received from the independent dental hygienists (Perry *et al.* 1997).
5. Regarding "structural" access criteria, the independent dental hygiene practices in California (Freed *et al.* 1997), along with similar practices in Colorado (Astroth and Cross-Poline 1998), were found, on evaluative analysis, to have very acceptable patient "wait times" for appointments (fewer than 16 working days) and adequate time scheduled for prophylaxis for a child (45 minutes) and an adult (30 minutes), as well as acceptable needs-based (rather than fixed-interval–based) recall schedules in place. These and the other results cited above prompted the observation that independent dental hygiene practices seemed more accessible to the public than dentists' practices (Kushman *et al.* 1996).
6. However, in view of the conflict between dental hygiene and dentistry mentioned earlier, the most interesting feature of these California "access" findings was the high level of subsequent visits to dentists by patients as a result of the hygienists' referral efforts (these were required under the design of the plan). Although, as described earlier, many of the patients had previously been very low users of dental care, the follow-up survey assessing the results was striking: 88 per cent of patients who had a regular dentist prior to the hygienist visits, and 84 per cent of patients who did not have a regular dentist before, visited a dentist within 12 months after their hygienist care (Perry *et al.* 1997). If the results reported in point 5 above prompted the observation about the independent dental hygiene practices seeming more accessible (or friendly) to the public, then the results described in this paragraph would seem to indicate that the independent dental hygienists made dentists (and their work) seem more friendly to many of these patients. Whatever one's interpretation, the independent dental hygienists played a large role in directing the flow of patients, especially previous low utilizers, to dentists (Kushman *et al.* 1996).

COST

Dental hygienists make a substantial contribution to the preventive and periodontal services provided in dental practice. In one Australian study (Brown *et al.* 1994), the percent of the offices' total procedures that were periodontally related in dentists' offices employing dental hygienists (38 per cent) was twice as high on average as the percent of these services in offices not employing dental hygienists (19 per cent). Bader *et al.* (1984) reported that the work of dental hygienists in 13 Kentucky dental practices amounted to one-fourth of the offices' total production of dental services but just one-eighth of the gross billings. Some authors claim that dentists make a substantial profit from the work of their dental hygienists (Manga 1997) while others, after surveying the literature, are uncertain about this (Walsh 1987).

The purpose of this section is to examine what is known from the published literature about the differences in the cost of dental hygiene services when they are performed in private dental offices and when they are self-initiated by dental hygienists in non-traditional practices. Not discussed here are the broader economic issues such as efficiency in health care markets, dental hygiene prices in competitive markets, human resource substitution, and the rate of return for dental hygiene services—for example, the rate of return revealed by the findings of Bader *et al.* (1984). Nor will a theoretical analysis be attempted of the complex but important consideration of the potential long-term savings in dental costs and possible better quality of life that may result from broadened access to preventive dental services in alternative dental hygiene practices, particularly by irregular users of dental care both in the community and in long-term care facilities.

There are very few published sources that look at actual dental hygiene costs in non-traditional practices; only one published comparison was found.

Anecdotal reports by dental hygienists who have started non-traditional practices sometimes state that the cost savings arising from the simplicity of their practice arrangements are passed on to patients (Brodie 1996); however, specific details are not provided. Since, as previously discussed, dentists rarely practise extensively on-site in long-term care facilities (Leake 2000), there are no data on the cost of their provision of preventive dental services that might serve as a standard of comparison for current and future initiatives by dental hygienists.

Two reports not available in published journals (and not examined by the present author) estimated that dental costs would be lower for dental hygiene services if these services were self-initiated by dental hygienists in alternative practices. Brown (1995), in a study for the Alberta Dental Hygienists' Association, suggested that dental prices could be 20 per cent lower. MacDonald-Wright (1994) in a thesis reported that dental costs up to one-third less than current Ontario costs for the same services could be achieved.

The only published comparison of dental hygienist and dental office fees that was available for examination comes from the California demonstration project of independent dental hygiene practice (Kushman *et al.* 1996). The authors compared the fees for various dental hygiene services provided by five office-based independent dental hygiene practices with the fees for dental hygiene services provided by about five dentists' practices located in the same geographic areas. Altogether, 29 dental practices were used in the fee comparisons.

The dental hygienists' fees were always lower than the adjacent dentists' mean fees for similar dental services (Kushman *et al.* 1996). The detailed comparison of fees was complicated by the common practice of bundling several individual fees into one (for example, a bundled maintenance recall fee consisting of a recall exam fee plus a prophylaxis fee with or without a fee for bitewing radiographs). Differences between the dental hygienists' preliminary oral examination fee and the dentists' examination fee also created problems for the analysis since the dentists apparently bill recall patients alternately every six months for a dentist's exam, then for a dental hygienists' preliminary oral exam at a lower fee. The least biased comparison, according to the authors, was the bundled maintenance recall fee for which they provided fee estimates that were both uncorrected and corrected to allow for the above-noted examination differences.

For a maintenance recall visit consisting of an examination, dental prophylaxis, and bitewing radiographs, the median difference was $23 lower for the independent dental hygienist fees relative to the dentists' dental hygiene service fees. (The range of the differences for the five sites was $11 to $29, with the hygienists' fees always being lower [Kushman *et al.* 1996].) The overall percent difference in mean fees (calculated by the present author) was 25 per cent and the corrected percent difference in mean fees was much lower at 11 per cent. For a similar maintenance recall visit without the radiographs, the overall independent dental hygienists' mean fee was 34 per cent lower (calculated by the present author) than the dentists' mean dental hygiene fee, with the corrected mean percent difference being 15 per cent lower. It should be noted that the larger, uncorrected percent differences more closely represent the likely differences in the overall average charges (or billings) for maintenance recalls between dentists' and dental hygienists' practices. The smaller, corrected percent differences are an attempt to compare more closely, in a "pure" sense, dental hygienist fee differences for maintenance recalls in the two different types of practices.

PATIENT HARM

There can be no doubt that there is risk of harm to patients when they are treated by dentists and dental hygienists. It is equally clear that the overall risk of harm to patients from dental treatment is very low. Despite the occasional severe and unfortunate occurrence of patient harm, dental treatment—appropriately selected according to evidence for efficacy and to patient need, and carefully provided according to accepted practice standards—does much more good than harm.

The purpose of this section is to examine whether there is evidence that the risk of patient harm is greater when den-

tal hygiene care is self-initiated in alternative practices by unsupervised dental hygienists than when this care is rendered in traditional offices by supervised dental hygienists. The true answer to this question requires a comparison study of dental hygienists working in the two different modes of practice. No such study exists of the risk of harm to patients. Nevertheless, because of its importance, further discussion is needed about the likelihood of harm to the patients of unsupervised dental hygienists.

Since there has been no documentation of undue patient harm caused by dental hygienists (Ontario 1996), even in the Canadian provinces and American states where dental hygienists can legally give local anaesthetic injections (Sisty-LePeau *et al.*1990), it is reasonable to assume that the presumption of harm persists in some who are against unsupervised dental hygiene practice. Given the reality of the very general and indirect nature of the current supervision of dental hygienists by dentists in private dental offices, if the provision of dental hygiene services such as dental prophylaxis, scaling, and root planing does not now result in undue patient harm in these offices, it is difficult to believe that these same services would cause patient harm when they are provided in unsupervised dental hygiene practices.

Some dental hygienists in non-traditional practices will provide dental hygiene care to the elderly, sometimes to medically compromised patients (Heisterman 1998), as well as to other patients with very poor oral hygiene and periodontal disease where bleeding during prophylaxis and scaling is anticipated. Some who oppose unsupervised dental hygiene practice may presume that such patients will not have medical histories carefully taken and assessed by unsupervised dental hygienists to see if they fit into the high- or moderate-risk endocarditis categories of the American Heart Association (Dajani *et al.* 1997) and thus need antibiotic prophylaxis prior to some dental hygiene services. This concern presupposes that the medical history-taking, interpretive skills, education, practice standards, and regulatory control of dental hygiene are deficient in this regard. The notion of such deficiencies has been rejected by a review body (Ontario 1996) and ignores the recognition that, as dental hygiene technology and dental hygiene's scope of practice grow, the preparatory education of dental hygienists must also grow (Johnson 1998). However, dental deficiencies with respect to medical histories do occur (Freed *et al.* 1997) and have been reported in a large survey in the United States where it was found that the updating of patients' medical histories by dentists was very poor (Morris and Bohannan 1997).

In the only comparative study yet published, Freed *et al.* (1997) compared a number of structural and process criteria in independent dental hygiene practices with the same criteria in a convenience sample of six general dental practices in California. (The dental practices were being assessed by one of the authors to see if they were eligible to participate in two different dental plans.) None of the criteria harms patients directly but, indirectly, deficiencies in them could bring harm to patients; thus, they are potential proxies for patient harm.

The structure of each practice (seven non-institutional dental hygiene and six dental practices) was evaluated by direct inspection (Freed *et al.* 1997). All the dental hygiene and dental practices were rated as completely or nearly completely acceptable on the criteria of "medical emergency preparedness," "after hours emergency care provisions," and "cleanliness." The criterion of "sterilization and infection control" was found to be acceptable in all seven dental hygiene practices but in just two of the six dental practices. Although lead aprons were consistently used in all practices, two of the dental hygiene and three of the dental practices were rated as unacceptable for "radiation safety" since thyroid radiation safety collars were not used consistently.

The process of care was assessed by patient record review (Freed *et al.* 1997) and involved 112 partly randomly sampled records from the six dental practices and 225 randomly sampled records from nine dental hygiene practices. The percent of records that were acceptable using the four criteria under the "medical/dental history" assessment is presented next. The percent of "present and completed medical histories" found in the patient records was identical and very high (97 per cent) for each of the two groups of practices. The recording and use of "medical alerts" (drug allergies and need for pre-medication) was more acceptable with the dental hygienists' records (81 per cent) than with the dentists' (63 per cent). The "follow-up of significant findings" (for example, on the medical history to check with the patient's physician if it is safe to proceed with dental treatment) was significantly more acceptable on the dental hygienists' records (77 per cent) than on the dentists' (17 per cent). Evidence on the patients' records that the medical history was updated at the start of each new sequence of treatment was significantly higher on the dental hygienists' records (91 per cent) than on the dentists' (42 per cent).

The evaluation of the independent dental hygiene practices in Colorado (Astroth and Cross-Poline 1998) used similar structure and process criteria as proxies for patient harm but without any assessments of dental practice. The Colorado levels of acceptability were reported to be similar but sometimes slightly lower than those found in California. The conclusions about patient harm in California and Colorado were also very similar: "… the evidence indicates that independent dental hygienist practice did not increase the risk to the health and safety of the public or pose undue risk of harm to the public" (Freed *et al.* 1997).

Unlike the preceding process criteria that may be considered as proxies for potential harm in a patient-safety sense, the clinical care process criteria that were also analyzed by Freed *et al.* (1997) may very subtly and indirectly be proxies for potential harm to patients in a quality sense. The patient records indicated that the dental hygienists provided a significantly more acceptable performance than the dental practices (by dentists or dental hygienists) for several of the clinical criteria that were assessed. These significant differences were found in the evaluation of periodontal status, the assessment of the soft tissues of the oral cavity, and

the quality of the bitewing radiographs. In none of the remaining process criteria that were evaluated did the percent acceptability of the dental practice criteria exceed that of the hygienists (Freed *et al.* 1997).

In reviewing the need for the order requirement from dentists before dental hygienists undertake tooth scaling, root planing, and curettage, the Health Professions Regulatory Advisory Council (HPRAC) of Ontario asked two very relevant questions about patient harm (Ontario 1996):

1. What is the risk of harm in allowing hygienists to self-initiate procedures?
2. Is the training to perform (the above acts) sufficient for self-initiation?

Having found that there was no evidence of harm to patients and having considered the arguments on both sides of the issue, HPRAC recommended in its report that the order requirement be eliminated and that the College of Dental Hygienists of Ontario develop appropriate regulations and practice guidelines. Although the Minister of Health subsequently rejected this recommendation, the rejection was not based on evidence of patient harm.

CONCLUSIONS

Demographic and disease changes will especially increase the public's need for the kinds of preventive and health promotional dental services primarily provided by dental hygienists.

Despite lingering problems in the amount and type of data available to provide high-quality evidence about the benefits or deficiencies of unsupervised dental hygiene practice, sufficient information is documented in this review to reach the following conclusions:

1. Unsupervised dental hygiene care in non-traditional practice settings in Ontario will increase public access, and particularly the access by special groups such as the institutionalized elderly, both to preventive dental hygiene care and, by increased referrals, to dentists' therapeutic care when needed.
2. Unsupervised dental hygiene care in non-traditional practice settings in Ontario can be provided at lower cost than the same care provided in supervised dental practices.
3. Unsupervised dental hygiene practice will not increase risk to the health of the public or pose undue harm to the patients of dental hygienists in these practices.

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