

Source: Journal of Dental Hygiene, Vol. 79, No. 1, Winter 2005  
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## **Disciplinary Actions Associated with the Administration of Local Anesthetics Against Dentists and Dental Hygienists**

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***Purpose.*** Research studies have demonstrated the need for and the ability of dental hygienists to provide local anesthetics for pain control and reduction of patient anxiety. Although two-thirds of state dental practice laws allow these services to be performed by dental hygienists, controversy exists between organized dentistry and dental hygiene regarding the administration of local anesthetics by dental hygienists. Some dentists believe the quality of care would be compromised and patient safety jeopardized because dental hygienists do not have adequate background knowledge to prevent complications and recognize emergencies caused by anesthetics. The purpose of this study was to collect quantitative data addressing safety when dental hygienists administer local anesthetics.

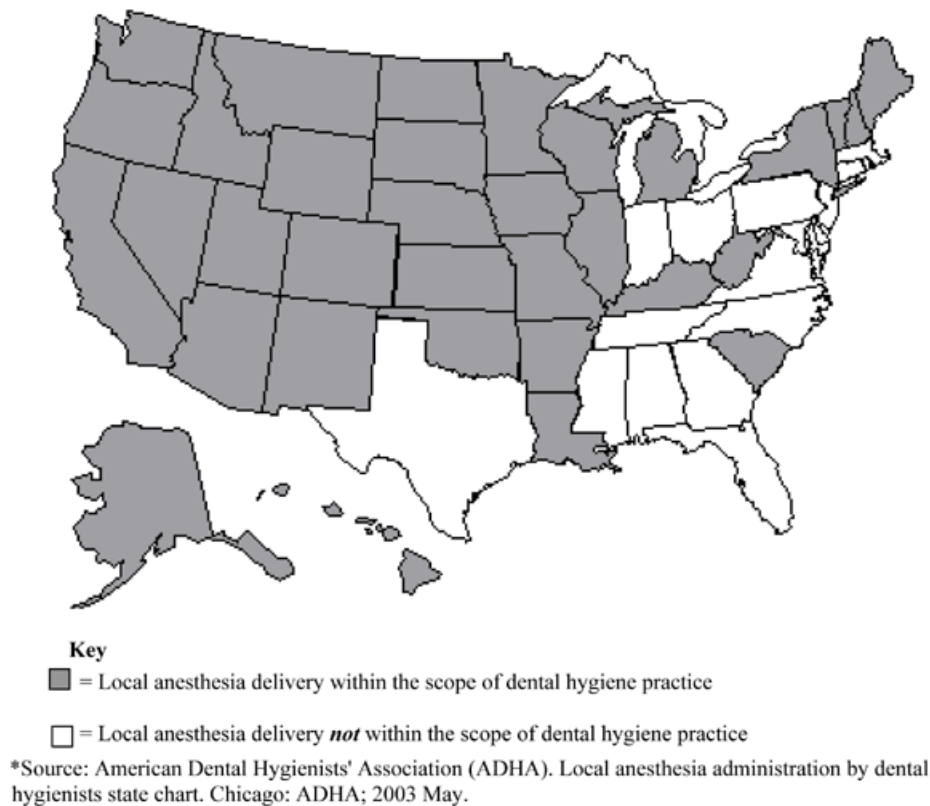
***Results.*** Eighteen responses were received, for a response rate of 69%. These data showed, over a 10-year period, no reports of disciplinary actions against dental hygienists for the administration of local anesthetics.

***Conclusion.*** This study affirmed public safety, which should be helpful to states considering statutes to allow the administration of local anesthetics by dental hygienists. Results suggest that properly educated dental hygienists in the states surveyed have administered local anesthetics to patients without harm.

**Keywords:** dental hygienist, local anesthetic, scope of practice, safety

### **Introduction**

The need for pain control in dentistry, as well as the safety and effectiveness of local anesthetics, has been well documented.<sup>1-5</sup> Controversy between organized dentistry and organized dental hygiene exists in some localities regarding the administration of local anesthetics by dental hygienists. A minority of state dental boards believe that the quality of patient care would be compromised and the safety of patients would be jeopardized because dental hygienists do not have sufficient background knowledge to prevent complications and recognize emergencies caused by anesthetic complications. Many research studies, however, have demonstrated the need for and the ability of dental hygienists to safely provide local anesthetics for pain control and reduction of patient anxiety.<sup>2,3,5-8</sup> As of July 2003, 33 state statutes allow dental hygienists to administer local anesthetics (Figure 1).



**Figure 1 .** State Statutes Allowing the Administration of Local Anesthetics by Dental Hygienists.

## Review of the Literature

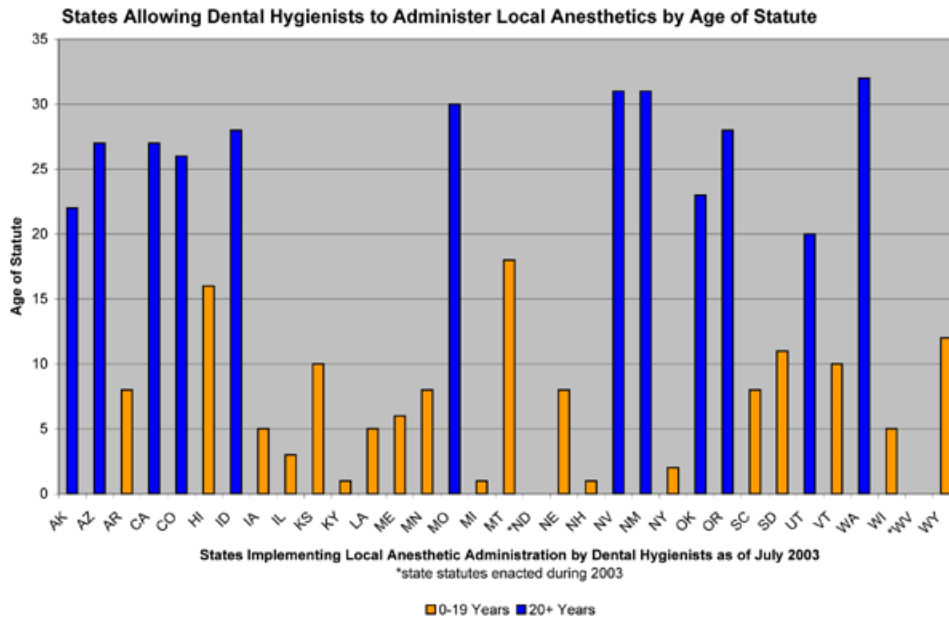
In the United States, an estimated 300 million local anesthetic injections are administered by dentists annually.<sup>9</sup> Established dosage guidelines are conservative and considered safe, with few significant adverse drug reactions reported. Some common complications of local anesthesia are paresthesia, trismus, hematoma, facial nerve paralysis, and mucosal lesions. Needle breakage caused by sudden patient movement is rare, but does occur. Some complications such as mucosal lesions and nerve paralysis may not be preventable.<sup>4, 10-13</sup>

Adverse reactions may also occur in patients with certain systemic conditions that heighten the risk of negative drug interactions or complications from the use of local anesthetics. By taking proper precautions, such as thoroughly reviewing and updating medical histories, oral health professionals may prevent emergencies and possible litigation.<sup>4, 12, 14-18</sup> Fatalities, although rare, have been known to occur from local anesthesia. Toxic reactions due to overdoses are generally the cause.<sup>19-21</sup> Many of these reactions are preventable and, with proper emergency management, fatalities need not occur.<sup>20</sup>

Stringent educational guidelines are followed in accredited dental hygiene programs to ensure that quality care is provided by student dental hygienists. Accreditation guidelines require dental hygiene programs to include courses from the biomedical, dental, and dental hygiene sciences.<sup>22</sup> Additionally, students must be prepared for medical and dental emergencies, including providing basic life support.<sup>22</sup> Programs and/or continuing education (CE) courses covering the administration of local anesthetics for dental hygienists must be completed at an accredited dental or dental hygiene school or in a program approved by a state board of dentistry.<sup>23</sup>

### Administration of Local Anesthetics By Dental Hygienists

Since 1972, dental hygienists have been authorized to administer local anesthetics under direct supervision in various states.<sup>23</sup> Thirty-three states currently have state statutes that permit dental hygienists to administer local anesthetics.<sup>23</sup> Twelve of the 33 states authorized dental hygienists to administer local anesthetics 20 years ago or more (Table I). Most states require direct supervision by a licensed dentist when a dental hygienist administers local anesthetics.



**Table I.** States Allowing Dental Hygienists to Administer Local Anesthetics by Age of Statute.

In 1972, the Forsyth Dental Center conducted a 25-week course of study to educate a select group of 10 recent dental hygiene graduates in advanced skills, such as the delivery of local anesthetics.<sup>24, 25</sup> A commission was appointed in 1975 to evaluate the reliability of the data and the validity of the conclusions.<sup>25</sup> There was an 86% success rate for obtaining adequate block anesthesia and a 97% success rate for infiltration anesthesia. This study revealed that, following 17,472 administrations of a local anesthetic, only three cases of short-term paresthesia were reported. In addition, the supervising dentist had to intervene only 1% of the time in order to achieve an acceptable level of anesthesia for the patient.<sup>25</sup>

In a 1990 study, the status of licensure specifications for dental hygienists administering nitrous oxide and topical, infiltration, and block anesthetics was determined.<sup>26</sup> Surveys were mailed to representatives of all United States dental boards and to all American Dental Hygienists' Association (ADHA) constituent dental hygiene presidents. There was a 76% (n=39) response rate from state dental board representatives and a 90% (n=46) response rate from the constituent presidents. In states where local anesthetic administration by dental hygienists was a legal service, the survey asked if reports of adverse reactions had been recorded. Both the boards and constituent presidents reported that there were no known adverse patient reactions or formal complaints against dental hygienists who provided these pain control procedures.<sup>26</sup>

Six months following a 24-hour CE course on local anesthesia offered to dental hygienists at the University of Colorado School Of Dentistry, 97 dentist/employers of the participants were surveyed to assess the qualifications and benefits of having the dental hygienist administer local anesthetics.<sup>27</sup> With 59% (n=57) returning the survey, dentists felt that both the patients and the dental practices benefited from the knowledge gained from the local anesthesia course. For example, 93% of the dentist/employers who responded reported that the schedule ran more smoothly, 80% reported that anesthesia was administered to patients who needed it on a regular basis, and 75% said patients were more comfortable during dental hygiene procedures.<sup>27</sup>

A 1997 study was conducted following a Minnesota CE course on the administration of local anesthetics by dental hygienists.<sup>28</sup> Participants were asked to report frequency of use, impact on practice, methods used, and complications that may have occurred. There was a 78% (n=273) response rate, with 88% reporting no complications from the administration of local anesthetics. Complications that were reported included hematomas (16%), heart palpitations (12%), paresthesia (2%), and allergic reaction (1%). The results of this study indicated that the respondents felt that, when they used local anesthetic, they provided more comfortable treatment for their patients (77%) with few complications.<sup>28</sup>

### ***Quality Assurance***

Each state legislature in the United States has established laws that regulate the practice of dentistry and dental hygiene.<sup>29-31</sup> State legislatures grant state boards of dentistry, administrative bodies whose primary duty is to protect the citizens of individual states, the authority to determine the rules and regulations governing the practice of dentistry. To ensure public protection, state legislatures impose laws based on the recommendations of the boards of dentistry that identify minimal standards of care that practitioners must provide. State legislatures and consumers rely on boards of dentistry as regulatory bodies to enforce the state practice acts that govern the dental profession.<sup>30</sup>

Although state practice acts differ in each state, there are common elements among licensing jurisdictions. Board members, whose eligibility varies from state to state, are qualified by their educational credentials and experience to serve on the board. The mission of state boards is to evaluate the quality of care provided by licensed practitioners to ensure protection for the public from practitioners who are negligent in the provision of care or who act in an improper manner. All state practice acts, except in Alabama, require graduation from an accredited school of dental hygiene and successful completion of both a written and clinical competency examination for dental hygiene licensure.<sup>29-31</sup>

State dental boards usually review complaints against dental practitioners before civil litigation is initiated, and they are empowered with legal authority to conduct disciplinary hearings.<sup>29, 31</sup> Infractions of the practice act, such as negligence, incompetence, fraud, and practicing beyond the scope of a dental or dental hygiene license, can lead to disciplinary action taken against both the dental hygienist and the dentist/employer. Disciplinary actions taken against dentists and dental hygienists for violations of the state practice act may include license suspension, license revocation, or civil fines.<sup>29, 31</sup>

The complaint review process against dental practitioners by patients is similar in most states.<sup>31</sup> In general, to initiate a complaint, a patient must submit the allegations in writing to the state dental board. The complaint must include the name of the dentist, the approximate dates of treatment, and a narrative detailing the alleged negligence or impropriety. A practitioner in the same field as the accused is usually chosen to serve as a consultant and review the complaint. The identity of the reviewing consultant remains anonymous; however, if an examination of the patient is required, the anonymity of the reviewer may be impossible. Upon completion of the inquiry regarding the complaint of the practitioner by a patient, the consultant forwards a factual report and an opinion regarding the merits of the complaint to the members of the state board.<sup>31</sup>

Once the report is received, the state board initiates an administrative review process to determine if the standards of care and practice of dentistry were violated. If the board members conclude that the practitioner violated the accepted standards of care and practice of dentistry, the severity of the infraction is determined. The violation is then classified as "slight," "moderate," or "substantial." A slight violation results in little or no damage to the patient. For example, a provider may fail to obtain an informed consent prior to extracting a tooth for which there is no treatment alternative. A moderate violation includes such situations as the failure to diagnose, treat, or refer to a specialist. For example, a practitioner may fail to diagnose periodontal disease that is developing, resulting in a decline of the patient's periodontal health. A substantial violation occurs when considerable harm is done to the patient, such as extracting the wrong tooth or teeth.<sup>31</sup>

Upon completion of the administrative review process, the enforcement division of the state board of dentistry has the authority to suspend or revoke a license to practice dentistry or dental hygiene if it concludes that a substantial violation has occurred. The practitioner has the right to reject or appeal the board resolution and request a review by an administrative law judge or a criminal court judge. Once a license has been revoked, a practitioner cannot have the license reinstated. In order to practice dentistry or dental hygiene again, the practitioner must reapply for licensure.<sup>29, 31</sup>

To date, few studies addressing the education, success rates, and safety of dental hygienists administering local anesthetics have been conducted. Therefore, this study was conducted to collect quantitative data that address the safety of dental hygienists administering local anesthetics.

## Methods and Materials

In 2000, a survey (Figure 2) was developed and faxed to 26 state dental boards that authorized dental hygienists to administer local anesthesia. Only those states allowing dental hygienists to administer local anesthetics for one year or more were contacted (Table II).

### General Questions

1. How can I get a copy of the state practice act?
2. Does the same board oversee dental hygienists and dentists? Yes    No
3. How many dental hygienists held a license for each year that dental hygienists were allowed to administer local anesthesia?

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999

4. How many dentists held a license for each year that is applicable to question #2?

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999

### Questions Specific to the Administration of Local Anesthetics

5. Is state certification required for dental hygienists to administer local anesthetics? Yes    No
6. How many dental hygienists held a certificate to provide local anesthesia in your state since 1990?

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999

7. Is there a required length for a local anesthesia course for dental hygienists to become certified? Yes    No

If yes, how many hours are required? \_\_\_\_\_

8. Who administers and/or sponsors the examination required for certification of dental hygienists to administer local anesthetics?

9. How many dentists have been disciplined each year with regard to the administration of local anesthetics since 1990?

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999

10. How many dental hygienists have been disciplined each year with regard to the administration of local anesthetics since 1990?

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999

Figure 2 . Survey Sample.

Alaska (1981)	Montana (1985)
Arizona (1976)	Nebraska (1995)
Arkansas (1995)	Nevada (1972)
California (1976)	New Mexico (1972)
Colorado (1977)	Oklahoma (1980)
Hawaii (1987)	Oregon (1975)
Idaho (1975)	South Carolina (1995)
Iowa (1998)	South Dakota (1992)
Kansas (1993)	Utah (1983)
Louisiana (1998)	Vermont (1993)
Maine (1997)	Washington (1971)
Minnesota (1995)	Wisconsin (1998)
Missouri (1973)	Wyoming (1991)

\*Year implemented in parentheses

**Table II .** States Surveyed in 2000\*

The survey was designed to collect data on disciplinary actions taken against dental hygienists and dentists when local anesthetics were administered to patients. The survey gathered general data and asked questions specific to the administration of local anesthetics. The purpose of general data questions was to determine how many dental hygienists and dentists held a license to practice each year from 1990 to 1999, and if dental hygienists and dentists were regulated by the same state dental board. Questions were designed to address the certification and educational requirements that enable dental hygienists to administer local anesthetics. If a positive response was indicated on the subject of certification requirements, follow-up questions were asked to determine the number of dental hygienists holding a certificate, the required length of certification courses, and the sponsoring body for the courses on the administration of local anesthetics. Respondents were asked to indicate the number of dentists and dental hygienists who had been disciplined for violation of local anesthetics administration requirements for each year from 1990 to 1999.

Telephone calls were made to representatives of each of the 26 state dental boards during the winter of 2000. Only those states allowing dental hygienists to administer local anesthetics for one year or more were contacted. Illinois was excluded, for example, as the practice act regarding local anesthetics was enacted in 2000, too recent to be of any statistical significance. The purpose of the telephone call was to obtain the name of a contact person and fax number for transmittal of the cover letter and questionnaire. For state dental boards that did not respond to the initial voice mail message, the name and fax number of a contact person were obtained from the Web site of the American Dental Association (ADA). Through the use of a fax cover sheet, respondents were assured that results would be reported in group format to protect each state's anonymity. For reporting purposes, each responding state was assigned a letter of the alphabet. In addition, respondents were asked to reply by fax, mail, or e-mail. To limit non-response bias, a second questionnaire was faxed to non-respondents. Data were tabulated and analyzed using descriptive statistics.

## **Results**

Of the 26 surveys faxed, 18 responses were received, for a response rate of 69%. The majority (n=17, 94%) of responding boards reported that certification was required for dental hygienists to administer local anesthetics. One state indicated that licensure was required for dental hygienists to administer local anesthetics.

The majority of respondents, (72%, n=13) reported that no disciplinary actions against dental hygienists for local anesthetic concerns were taken during the 10-year period, while the remaining 28% (n=5) reported that this information was not available. Sixty-seven percent (n=12) of the state boards reported no disciplinary action against dentists during the 10-year period, while 28% (n=5) reported that this information was not available. Five percent (n=1) reported two disciplinary actions against dentists relating to the administration of local anesthetics.

Sixty-seven percent (n=12) reported a required minimum length of time for a local anesthesia course for dental hygienists, ranging from 14 to 72 hours. The remaining 33% (n=6) answered "no" when asked if there was a required length for a local anesthesia course. Thirty-nine percent (n=7) were required to pass a dental board sponsored examination, while the remaining 61% (n=11) had to successfully complete a dental board-approved course.

## **Discussion**

There has been much discussion regarding the administration of local anesthetics by dental hygienists. Negative claims relating to patient safety have been circulated, yet there appears to be little scientific research to substantiate a lack of safety when local anesthetics are administered by dental hygienists. The lack of disciplinary actions against dental hygienists (0=local anesthetic), as determined by state dental board disciplinary actions, suggests that dental hygienists can be taught to safely administer local anesthetics without harm to patients. Research on administration of local anesthetics by dental hygienists dates back to the 1972 "Forsyth Experiment" that included the successful teaching and administration of local anesthetics by dental hygienists.<sup>24, 25</sup> A study by Sisty-LePeau in 1990 also found that dental hygienists could safely administer local anesthetics.<sup>26</sup> The results of the present study found negligible disciplinary actions against dentists and none against dental hygienists regarding the administration of local anesthetics. In addition, this study corroborates information from the National Practitioner Data Bank (NPDB)<sup>32</sup> and data from the American Association of Dental Examiners that document a low rate of adverse incidents involving both dentists and dental hygienists who administer local anesthetics.<sup>33</sup>

Due to the lack of information on this topic in refereed journals, this study attempted to collect information directly from the state licensing or disciplinary boards. The response rate from the state boards, however, was lower than anticipated. Of the 18 states that did respond, 12 provided incomplete responses about the number of licensed dentists and dental hygienists. The lack of data was indicated by leaving the response area blank on the return survey or indicating that the information was not available.

Fifty percent of the responding states had statutes allowing dental hygienists to administer local anesthetics for over 10 years, with five states allowing this practice for more than 25 years. This length of time should be adequate to collect and review data on disciplinary actions that could have documented occurrences of unsafe or harmful practices by dental hygienists who administer local anesthetics. In addition, the number of state statutes allowing local anesthetic administration by dental hygienists has more than doubled since 1990, with six additional state statutes legalizing the practice since this study began. These states are Illinois (2000), Kentucky (2002), Michigan (2002), New Hampshire (2002), North Dakota (2003), and West Virginia (2003).<sup>23</sup> This legalization may not have occurred had any significant disciplinary actions against dental hygienists been documented.

Considering that an estimated 300 million local anesthetic injections are administered annually,<sup>9</sup> the rate of disciplinary actions is very low. Similar to research conducted by Sisty-LePeau in 1990, this research encountered comparable problems.<sup>26</sup> For example, there was no consistency in record-keeping among states, which made the accurate collection of data difficult. Some state licensing boards reported that all dental hygienists could administer local anesthetics, while others indicated an unknown, limited number.

Although this study did not determine the actual cause of disciplinary actions, a review of malpractice litigation found that most complications could have been prevented if a thorough health history had been evaluated and/or if the proper dosage of medication had been administered, thus avoiding a toxic reaction.<sup>19-21</sup> Future investigation may include a study of how thoroughly health histories are reviewed in dental practices, as well as how frequently a patient's vital signs are obtained before administering local anesthetics.

Investigating malpractice insurance rates among states may be another area of investigation that may support the findings of this study. Some questions that may be asked include whether malpractice rates have increased for dentists and dental hygienists in states that allow the administration of local anesthetics, and how these rates in states where dental hygienists may administer local anesthetics compare to rates in states where they may not. Dentists should be included in the study,

as a patient may bring litigation against a dentist as well as a dental hygienist because the dentist is directly responsible for care provided by the dental hygienist.

## **Conclusion**

Debate still exists between organized dentistry and dental hygiene over the administration of local anesthetics by dental hygienists. Current evidence, however, indicates that dental hygienists have demonstrated successful and safe administration of local anesthetics to dental patients.

## **Acknowledgements**

## **Notes**

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