

# Research

## Patients' Perspective Regarding the Administration of Local Anesthesia by Dental Hygienists

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### Abstract

**Purpose:** Local anesthetics have been used in dentistry to aid patients in pain control during a wide range of surgical and non-surgical procedures. The purpose of this study was to explore the perspectives of patients regarding the administration of local anesthesia (LA) by dental hygienists.

**Methods:** This qualitative study used an exploratory, online, focus group design. Four online focus groups were held with 18 participants recruited through purposive sampling. Pseudonyms were used to protect participants' confidentiality. A questioning route was established for the groups and validated by focus group experts and pilot testing procedures. Each focus group session was recorded and transcribed. Themes were analyzed using classic analysis strategy. Validity was established using investigator triangulation, saturation and member checks.

**Results:** Three major themes were identified regarding the administration of local anesthesia by dental hygienists. The first theme identified was the patients' experience and the value participants placed on patient-centered care. The second theme was the participants' unclear perceptions regarding the dental hygienists' educational qualifications to administer LA and complete a dental hygiene diagnosis. The third theme revealed future suggestions for dentists and legislators from the participants.

**Conclusion:** This qualitative study offers insight into the patient's perspective of dental hygienists administering LA. Participants supported dental hygienists administering LA and appreciated the aspects of patient-centered care that this practice provided. Patient participants were unclear on educational requirements and training, but supported legislation allowing dental hygienists to administer LA.

**Keywords:** local anesthesia, pain control, delegation skills, dental hygienists, patient centered care

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### Introduction

Local anesthetics have been used in dentistry to aid patients in pain control during non-surgical periodontal therapy (NSPT), restorative care, surgical care, and cosmetic therapy. Washington became the first state in which dental hygienists were licensed in 1971 to administer local anesthesia (LA).<sup>1</sup> Forty-five states have added this pain control procedure to the dental hygiene scope of practice over the past 48 years. Currently, Texas, Delaware, Mississippi, Georgia, and North Carolina do not allow dental hygienists to administer LA.<sup>1</sup> Dental hygienists continue to lobby to add this duty to every state practice act and in addition to expanding the scope of practice to administer LA under less restrictive supervision levels.

Local anesthesia supervision laws for dental hygienists vary, with a few states requiring no supervision, while other states require direct supervision indicating that the supervising dentist must be physically present for the procedure.<sup>1</sup> Dental hygienists persist in advocating to change supervision levels for the administration of LA. Relaxing the supervision requirements would allow dental hygienists to practice in unsupervised settings that could increase patients' access to care. All oral health care professionals licensed to deliver LA (dental hygienists, mid-level providers, and dentists) are educated in its related theory and practice as part of an accredited educational curriculum, or in an approved LA education course as part of the licensure process.<sup>2,3</sup>

However, while all states consider dentists to be competent as part of their educational curriculum, LA laws and statutes vary widely for dental hygienists. Half of the states require successful completion of a licensure examination that includes LA administration while the other half consider the completion of the LA coursework as evidence of mastery of the skill.<sup>1-5</sup>

The safe administration of LA by dental hygienists has been consistently documented over the past 40 years.<sup>6-10</sup> Even when a complication occurs, such as shock, burning, hematoma, syncope, or tachycardia, it is usually mild in nature, and temporary. Many of these types of complications are avoided by adhering to safe practices and utilizing the standard emergency protocols taught in professional curricula and continuing education courses.<sup>6,8,11,12</sup>

When considering scope of practice issues regarding the administration of LA, it is important to explore the perspectives of all stakeholders. Perspectives of dental hygienists and dentists have been reported in the literature, however little is known of the patient's perspective. Researchers have found that dentists utilizing a dental hygienist to administer LA believed patients were more satisfied and comfortable during NSPT, and both the dentists' and dental hygienists' schedules ran more smoothly.<sup>13,14</sup> Dental hygienists also reported that they were more efficient, thorough, and could provide a more comfortable experience for patients during NSPT.<sup>13-16</sup>

Patients' needs, concerns, comfort, and safety are a key to providing comprehensive, efficacious care. Optimal care influenced by the patient's opinions and values, is considered to be patient-centered.<sup>17-19</sup> The Commission on Dental Accreditation (CODA) further clarifies patient-centered care as considering the patient's preferences, social, economic, emotional, physical and cognitive circumstances when determining appropriate treatment.<sup>2</sup> Walji et al. indicated person-centered care involves making dental patients equal partners when determining treatment and viewing patients as experts in their personal decisions. Health care providers and patient can agree on a treatment plan for the best outcome for the individual patient.<sup>17</sup> The purpose of this study was to understand the patients' perspective regarding the administration of LA by dental hygienists.

## Methods

Institutional Board Approval was received from the Human Subjects Committee, Idaho State University, for this qualitative, exploratory design study (IRB-FY2019-68). Exploratory design is used when there are few or no earlier studies to predict an outcome<sup>20</sup> as was the case regarding

patients' perspectives on the administration of LA by dental hygienists. Patient perspectives were explored through a series of online focus groups as a means to understand why these opinions were held, while allowing for follow up questions as necessary.<sup>21</sup> The qualitative information gained can be used to guide policy development and ensure consumer satisfaction.<sup>22</sup>

Patients over the age of 18, who had experienced a dental hygienist administering local anesthesia for NSPT within the last two years, were recruited for this study. Exclusion criteria included anyone who had worked in a dental setting or who had immediate family members employed in a dental setting. Additionally, the LA may not have been administered in an educational facility.

Focus groups usually consist of five to eight people with a common trait.<sup>22</sup> This size is considered to be significant to ensure the group is small enough so all participants can be heard, but large enough that a variety of perspectives are collected. In this study, a purposeful sample of 20 patient candidates were recruited through social media and personal networking; relying on both a gift motivation (a \$30 gift card) and recommendations by others (dental hygienists) to participate. Once the potential sample population was identified, participants were given a pre-screening form to determine whether they met the inclusion criteria. Participants were given a written informed consent to sign. Pseudonyms were used to protect participant confidentiality.

An online video conferencing platform, Zoom (San Jose, CA), was used for the focus groups. Each focus group lasted 40 – 45 minutes and had a specific set of interview questions designed to evoke conversation and address the research questions. Saturation was considered complete when the range of ideas had been discussed and no new information was gained.<sup>23</sup> The questioning route included five elements: an opening question, introductory questions, transition questions, key questions, and an ending question;<sup>22</sup> and was validated by two focus group experts.

The primary investigator (PI) moderated each focus group to keep the discussion on track, draw out quieter members of the group and limit dominant talkers. In order to limit PI bias, a bracketing interview was conducted. The following research questions were used to guide the focus group discussions:

- What do patients perceive as the benefits and disadvantages of dental hygienists administering LA?
- Do patients perceive a difference between dentists and dental hygienists administering LA?
- What are patients' understanding regarding the educational preparation of dentists and dental hygienists to be able to administer LA?

The interview questions were pilot tested and recorded with three individuals who fit the focus group profile, along with an experienced moderator to offer recommendations.<sup>23</sup> The pilot test verified participants understood the questions, and the secondary facilitator confirmed the questioning route was followed closely to ensure biases were not introduced. At the conclusion of each focus group, an ending question was asked to help identify key concepts from the discussion that the participants felt were important.<sup>22</sup>

Each focus group session was recorded and saved. Access to the recording and transcription was limited to the PI, co-investigators, and a professional transcriptionist who prepared the transcript. The PI and co-investigators systematically studied the transcripts using the classic analysis strategy of placing statements of participants into categories under each question answered to identify themes.<sup>22,23</sup> Themes were recognized based on frequency (how often something is said), specificity (statements that provide detail), emotion (when a participant uses passion or intensity), and extensiveness (many different people saying the same thing).<sup>22</sup>

Validity was established through investigator triangulation with two or more investigators independently analyzing the data separately and obtaining similar results.<sup>22,23</sup> The PI and two co-investigators analyzed the data independently and shared the findings with all researchers to determine common themes found. Saturation was reached when new focus groups did not add new information or repeated themes from previous sessions. Validity was also established with member checks within the groups by sharing themes discovered with the participants to determine agreement; considered to be a best practice in controlling personal biases and ensuring researchers understand what has been said.<sup>23</sup>

## Results

A total of 20 participants joined the focus groups. However, after one of the groups began, two participants left the session due to poor Internet connection and personal issues requiring immediate attention (n=18). Participant were from seven states including Wyoming, Indiana, Ohio, Alaska, Florida, Utah and Idaho, and consisted of 10 females and 8 males, with the majority being between the ages of 30-50 years (n=9). Demographics were dispersed across the focus groups providing a balance of geographic location, gender and age (Table I).

Three major themes along with subthemes in each category were identified regarding dental hygienists administering local anesthesia through the focus group sessions (Figure 1.) Participant quotes supporting the themes are shown in Table II.

### Theme 1. Patient experiences

The overwhelming subtheme of patients' experiences was the value participants placed on their time. Patients appreciated the time saved when

their dental hygienist administered the LA; a subtheme mentioned 31 times in response to several different questions. One participant stated, "I work long hours, so I feel like my time's valuable and I like the fact that they get you in (and out quickly)." Several others mentioned the inconvenience of waiting for the dentist to administer the LA; "you don't have to wait for the dentist to finish with another patient and then come to you and then perform the same thing that the dental hygienist could do." Others elaborated by indicating that when the dental hygienist administers LA it saves the dentist time, freeing the dentist to perform other tasks only they can do.

Many participants mentioned they would prefer their dental hygienist administer the LA because of the trust, rapport, and comfort level they felt. Several participants mentioned rapport was built by the amount of time they spent with their dental hygienist, and others commented on the outgoing personalities of their dental hygienist. Focus group participants frequently expressed the LA experience was less stressful and more calming when administered by the dental hygienist than the dentist. Some participants attributed this to a general anxiety of being around dentists, while others commented on how they felt more at ease because of the relationships developed with their dental hygienist. One participant noted, "The disadvantage of (having) the dentist (give the injection) is the whole stigma of people feeling that anxiety when they see a doctor." Another indicated, "I was probably a little bit more relaxed. It felt more of a casual experience because I deal with her more often than my dentist."

A final subtheme was the majority of participants' felt their dental hygienist provided a more comfortable LA administration technique than

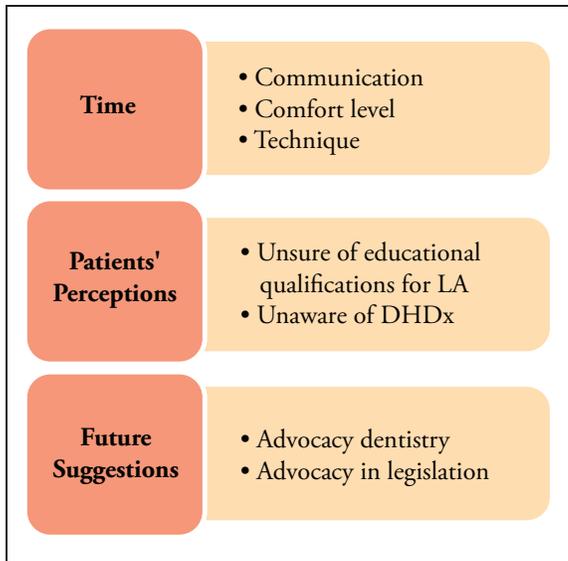
**Table I. Focus group demographics (n=18)**

Characteristic	n (%)
<b>Gender</b>	
Female	10 (56%)
Male	8 (44%)
<b>Age</b>	
18-30	2 (11%)
30-50	9 (50%)
50+	7 (39%)
<b>Location of Participant</b>	
Idaho	6 (33%)
Utah	4 (22 %)
Ohio	2 (11%)
Alaska	2 (11%)
Florida	2 (11%)
Wyoming	1 (6%)
Indiana	1 (6%)

**Table II. Questioning route with selected responses**

Focus Group Question	Selected Responses	Focus Group Question	Selected Responses
Share any differences you have noticed between the injections given to you by the dental hygienist and dentist?	<p>“I actually noticed that my hygienist was a little more gentle with me...I have noticed that the dentist is a little more rushed when giving me injection.”</p> <p>“The hygienist gave the injections. It’s a very similar technique as what the dentist used being very patient and I didn’t feel hardly anything.”</p>	If your dentist were not utilizing a dental hygienist to give injections, what would you say to him or her?	<p>“That they’re wasting that person’s education essentially and they’re putting more on their plate that they don’t need.”</p> <p>“...having had it done this way now and seeing the speed of service and the improved rapport, it definitely is something that I would look for when I went somewhere else.”</p> <p>“Typically, I’m trying to squeeze everything in on a tight schedule, so I’d probably just voice something to see if I can get a hygienist to help out, versus waiting for the dentist.”</p>
What benefits have you noticed by having the dental hygienist provide the injection for you?	<p>“...you don’t have to wait for the dentist to finish with another patient and then come to you and then perform the same thing that the dental hygienist could do.”</p> <p>“I definitely felt more comfortable with the hygienist.”</p> <p>“The hygienist is right there. She gets doing the deep cleaning and you find a sensitive area, she can give you another injection.”</p>	Dental hygienists are unable to administer local anesthesia and practitioners in five states, and they are trying to pass legislation to allow this practice. If you were talking to a legislator in these states, what would you say?	<p>“I would just say from my own experience, I haven’t found there to be any negatives to allowing dental hygienists to perform injections. And in fact for me it has been a more positive experience overall and I feel competent in their training and abilities.”</p> <p>“...allow them to do it because when I’m with the dentist, I don’t want the dentist rushed to be giving injections to somebody else. I would rather him be focused on my needs at that time where the hygienist is qualified to give those injections where he doesn’t need to leave and come back.”</p> <p>“I would just say that the states that are not allowing this at this time are behind on the times. Whereas this is the norm for most states that allow the hygienists to give these injections and it does make the patient feel more comfortable in the dentist office.”</p>
Are there any disadvantages to having the hygienist give the injection?	<p>“Maybe she wouldn’t spot a problem immediately like a dentist would while she’s cleaning or something.”</p>		
What benefits have you noticed by having the dentist provide the injection for you?	<p>“I don’t see any advantage with the dentist doing it over the hygienist.”</p>		
Are there any disadvantages to having the dentist give the injection?	<p>“Your hygienist is basically there through the whole procedure where the dentist, he’s got multiple patients so you feel like he’s being rushed, where your hygienist isn’t.”</p>	What else would you like the researcher to know about this topic?	<p>“...if they’re (hygienists) qualified to do the injections and everything, they should be allowed to do it. They shouldn’t have their skills hindered.”</p> <p>“You don’t just keep doing things the way we’ve always done them, because we’ve always done it that way, so if things are changing, it seems odd that five states aren’t doing it. If the history is shown and people are saying that it works just as good, it’s more efficient, they’re just as good at doing it. As long as they’ve got the training, it just seems logical.”</p> <p>“I would be a very strong advocate...If they have any questions, go experience it for yourself. Have the dentist give him a shot or have the hygienist and make your own decisions.”</p> <p>“The only thing that I would add is, whenever I make an appointment to go to my dentist, I always make sure that the hygienist that I see is working. I won’t make an appointment with him if she’s not there that...She’ll be 90 percent of the reason why I continued to go to this dentist.”</p>
Tell me what kind of training you think dental hygienists and dentists have to be able to give LA?	<p>“Honestly don’t know the answer to that question.”</p>		
Do you think dental hygienists or dentists have more supervised clinical experiences with local anesthesia in an educational setting?	<p>“To me it seems like they should both require the same training, but just in my head it seems that by practice, I think dentists would receive more practice.”</p>		

**Figure 1. Themes and subthemes**



their dentist. When asked what differences were noticed between the dental hygienist and dentist administering LA, participants either stated that there was no difference, or they had a better experience with their dental hygienist. One participant explained, “The dental office I go to is very busy and I notice that the dentist is a little more rushed when giving me injections. I did notice that the dental hygienist took her time a little bit more and was gentler.” Others appreciated the way the dental hygienist explained the procedure thoroughly and that injections were slower and felt more comfortable and not rushed. Overall however, patients were satisfied with dentists administering LA; over one-third (39%) did not see any disadvantage to having the dentist give LA. The majority (61%) of those indicating a disadvantage were primarily concerned about the waiting time or feeling like the dentist was rushed.

### ***Theme 2. Patients' perceptions***

Focus groups addressed two questions regarding the LA educational requirements and clinical supervision of dental hygienists and dentists. In general, it became apparent that patients do not understand educational qualifications required when learning to administer LA. Two participants believed that assistants were giving injections, and almost all began their answers with “I don't know”, “I think”, or “I'm guessing” indicating generalized uncertainty. Two-thirds of the participants believed dental hygienists and dentists had similar

education and training while the remainder believed that dentists had more education and clinical training. One participant stated, “I think dentists would have more training. It's their office and the buck probably stops with them.” Others believed the dental hygienist had more clinical training due to their relationship with their dentist employers; “I think that your hygienists have a little more clinical (training) because the dentists work with them until they work up to feeling comfortable to be able to do that.”

Overall, participants identified few disadvantages to having the dental hygienist administer LA. However, two individuals mentioned that it would be better to have the dentist administer the injection because they might find decay or infection stating that, “maybe she wouldn't spot a problem immediately like a dentist would.” When asked to clarify what was intended by a problem, this participant gave the example of finding a cavity.

### ***Theme 3. Future suggestions***

Although the majority of participants indicated a preference in having their dental hygienist administer LA, two-thirds of participants were uncomfortable questioning their dentist if the dental hygienist was not administering the LA for NSPT. However, some participants believed they would actually say something to the dentist or even switch dentists if their dental hygienist was not administering the LA. Several participants indicated they would make comment to the dentist because they valued the time saved when the dental hygienist administered the LA. One participant stated, “He's (the dentist is) wasting his or her time... and pretty much undermining his hygienist. There is no point in not letting someone do what they're educated to do if it makes things easier.” Others stated they would make comment to the dentist because of the rapport they have with their dental hygienist, or their ability to ease their anxiety.

Focus group participants unanimously believed legislators should allow for changes in the practice acts for dental hygienists to administer LA. One participant summed it up by saying, “It has been a more positive experience overall and I feel confident in their training and abilities.” Another recognized the similarity of the extensive skills required to provide LA and NSPT and stated, “I would tell them (legislators) that what my hygienist normally does in my mouth is a lot more complicated than giving a shot, and if I don't trust them to give a shot, then what am I doing letting her do my cleaning?” While yet another explained, “I think it's total patient care. I think they should allow it (dental hygienists administering LA) because... the dentists are rushed. If they had the hygienist do some of the workload, then it would just be better patient care for everyone.”

## **Discussion**

The Institute of Medicine defines patient-centered care as “providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical

decisions.<sup>2,24</sup> The dental profession promotes providing high quality, patient-centered care to achieve optimal treatment results.<sup>2,3</sup> Previous studies from the perspective of dental hygienists indicates clinicians perceived patients were more comfortable, appreciated the time saved and appreciated dental hygienists' skills when they administered LA.<sup>13,14</sup> Results of this study confirm that patients value the time saved, decreased pain, and continuity when dental hygienists administer LA, but also revealed the value placed on their relationships with dental hygienists. Moreover, study participants indicated feeling less anxious when receiving LA injections from the dental hygienist versus the dentist. Previous research by Weintraub found that patients not only expect to have their needs and desires included in decision making about their treatment, but they will comparison shop and leave dental practices that are not offering patient-centered care.<sup>18</sup> This same mind-set was validated in the focus group discussions.

Malamed, has anecdotally stated that when dental hygienists administer LA, patients "frequently comment on the lack of discomfort when the hygienists injects the local anesthetic. Be it a slower rate of administration, more attention to details of atraumatic injection technique, or greater empathy, it works."<sup>8</sup> Results from this study confirmed this statement when all focus group participants reported injections administered by dental hygienists provided a similar experience to those administered by a dentist; half of the participants stated having a more positive experience when the dental hygienist administered the LA. From participants stating that they had a better experience with the dental hygienist, it was learned that patients value not being rushed, a slower injection technique, and being talked through the experience. This correlates with research indicating that injections are more comfortable when administered slowly.<sup>4,5,8</sup> Additionally, findings from the focus groups support previous research indicating that patients appreciate it when clinicians respect their needs, listen to their concerns, and explain procedures before performing.<sup>17-19</sup>

All state licensing agencies allowing dental hygienists to administer LA within their practice acts require the completion of an education course either as part of their accredited dental hygiene education program or through a board approved post-graduate LA course.<sup>1</sup> Teeters et al. found that dental hygienists in the state of California are considered to be adequately educated in LA administration and have more supervised LA clinical experiences than their dental student cohorts.<sup>25</sup> However, focus group participants in this study clearly had little knowledge of the educational requirements, or what was involved in for clinical training.

Dental hygienists are educated to perform a comprehensive examination and assessments including a dental hygiene diagnosis (DHDx).<sup>26</sup> While a majority of participants believed there were no disadvantages in regards to dental hygienist administering LA; two individuals felt that the dentist might see decay while giving injections. However, since dental hygienists spend considerable time in the oral cavity while performing NSPT and are also educated to make a DHDx, it would be more likely that the dental hygienist would identify a problem area ahead of the dentist. It is important for dental hygienists to educate patients on their education and training particularly in the area of general and oral health evaluation and assessments and the DHDx.

### ***Implications for Dental Hygiene Practice***

Results from this study indicate that patients do not understand the scope of practice for dental hygienists or the educational requirements. Dental hygienists should introduce themselves providing their title and explain the educational training and qualifications for administering injections and performing DHDx throughout the care appointment. Additionally, dental hygienists can reinforce the practice of patient-centered care during the administration of LA by forming relationships with patients, respecting their time, giving injections slowly, and listening to patients' needs and concerns.

### ***Implications for Dentists***

Results from this study, indicate a theme of appreciation when dentists utilize dental hygienists to administer LA. Dentists should consider utilizing dental hygienists to administer LA as a means to decrease patient wait time, and provide more time to perform tasks that are exclusive to their scope of practice. Dentists practicing in states prohibiting the administration of LA by dental hygienists should take consumers' desires into consideration and work towards offering more patient-centered care by responding to the principles valued by the consumers. Dentists may be more likely to support legislation to allow dental hygienists to administer LA if they are able to acknowledge the positive impact dental hygienists who administer LA can have on their practices.

### ***Implications for Legislators***

Results of this study identify values constituents have in regards to legislation of LA administration by dental hygienists. In states allowing dental hygienists to administer LA, focus group participants overwhelmingly supported the practice, and felt that dental hygienists are adequately trained to perform this procedure. Participants explained that their experiences of a dental hygienist administering LA was

equal to or more positive than that of their dentist and that they enjoyed the continuity of having the dental hygienist throughout the whole experience. In general, participants agreed that legislation needs to keep up with the majority of states that allow for LA administration practices that have been shown to be safe over time.<sup>10</sup>

Limitations of this study include the purposive sampling and qualitative technique used to gather data which limits generalizations to entire populations of patients. Qualitative techniques however, are not intended to generalize, but rather provide the ability to learn about in-depth perceptions and opinions, as well as trends and patterns which may not be represented through survey research.<sup>23</sup> Another possible limitation was the PI served as moderator for the focus groups, however steps were taken to control for moderator bias. Additional research might include the perspective of patients regarding supervision levels and unsupervised administration of LA in populations unable to access dental care. Future studies may also include perspectives of dentists and dental hygienists regarding the administration of LA.

## Conclusion

This qualitative study offers insight into the patient's perspective of dental hygienists administering LA. Participants supported dental hygienists administering LA and appreciated the aspects of patient-centered care this practice provided. Patients were unclear regarding the educational requirements and training, but supported legislation allowing dental hygienists to administer LA.

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