

# Data Brief:

## Assessment of Oral Cancer Screenings and Knowledge of Human Papillomavirus Among Dentists and Dental Hygienists in Ohio



2022-2023



Department of  
Health

# Key Findings

*The Ohio Department of Health (ODH) conducted a survey of Ohio dentists and dental hygienists to assess their knowledge of, attitudes about, and practices related to oral cancer screenings (OCSs), Human Papillomavirus (HPV), and the HPV vaccine. The survey was administered by the ODH Oral Health Program on behalf of the Ohio Partners for Cancer Control (OPCC), a statewide coalition dedicated to reducing the burden of cancer in Ohio.*

## **Oral Cancer Screening Practices:**

- Overall, more than 90% of dentists and dental hygienists perform OCSs at least once per year.
- Dentists are more comfortable performing OCSs than dental hygienists.
- Dental professionals with fewer years of experience are less comfortable with performing OCSs.
- The hard palate and under the mandible along the neck are the areas most missed by dental professionals when performing an OCS.

## **HPV and HPV Vaccine Knowledge:**

- Dental professionals generally lack adequate knowledge about HPV and the HPV vaccine, as indicated by both test results and self-ratings. Dentists and dental hygienists are relatively equal in knowledge.
- Almost all dental professionals (91%) are aware that HPV infection could cause oropharyngeal cancer, but they are less familiar with the details of the HPV vaccine schedule.
- Dental professionals with fewer years of experience have less knowledge about the HPV vaccine.

## **HPV Vaccine Attitudes and Practices:**

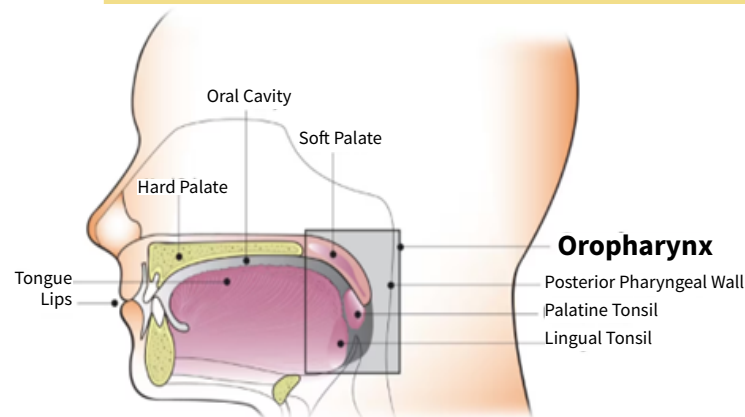
- The majority (85%) of dental professionals do not routinely ask about or advise patients on the HPV vaccine, although dentists are more comfortable doing so.
- Only one-third of dental professionals agree or strongly agree that dental professionals should discuss the HPV vaccine with patients or parents, with nearly half holding a neutral stance.
- There is strong interest among dentists and dental hygienists in educational resources on oral cancer, HPV, and the HPV vaccine, particularly online courses, informational pamphlets, and fact sheets for patient distribution.

## Background

HPV is the most common sexually transmitted infection in the United States.<sup>1</sup> Most HPV infections are cleared from the body on their own, within one to two years of infection. However, persistent infection with high-risk HPVs can lead to cancer. Cancer diagnosed in an area of the body where HPV is often found is called HPV-associated cancer. HPV-associated cancers can be found in six areas of the body, including the oropharynx.<sup>2</sup>

The oropharynx, one of two sites where oral cancer can be found, refers to the back of the throat, including the tonsils and the back one-third of the tongue, also known as the base of the tongue. Cancer in the oropharynx is called oropharyngeal cancer.<sup>3</sup> While many oropharyngeal cancer cases may be caused by a combination of tobacco, alcohol, and HPV, approximately 70% of oropharyngeal cancer is probably attributed to HPV.<sup>1, 3</sup>

The second site where oral cancer can be found is the oral cavity. Oral cavity cancer is located towards the front of the mouth including the lips; front two-thirds of the tongue; the inside of the cheeks; and the hard palate, or roof of the mouth.<sup>1</sup> Most oral cavity cancer is related to tobacco use, drinking alcohol, or both, with a very small number attributed to HPV.<sup>4, 5</sup>



Source: [Centers for Disease Control and Prevention](#)

According to the [Cancers Associated with HPV in Ohio](#) report, in 2016-2020, oropharyngeal cancer was the most common HPV-associated cancer in Ohio accounting for 887 of the 1,958 annual cases for all HPV-associated cancers. Oropharyngeal cancer is most common in white, non-Hispanic males over the age of 50. Geographically, in Ohio, oropharyngeal cancer rates are higher in rural counties compared to urban and partially rural counties and in Appalachian counties compared to non-Appalachian counties.<sup>6</sup>

1. [HPV and oropharyngeal cancer](#). Centers for Disease Control and Prevention (CDC), November 2023.
2. [HPV and cancer](#). National Cancer Institute at the National Institute of Health (NIH), October 2023.
3. [Cancers linked with HPV each year](#). CDC, November 2023.
4. [HPV / Oral Cancer Facts](#). The Oral Cancer Foundation, No date, Accessed July 2024.
5. [Oral Cancer](#). National Institute of Dental and Craniofacial Research, June 2023.
6. [Cancers associated with human papillomavirus in Ohio](#). Ohio Cancer Incidence Surveillance System, Ohio Department of Health and The Ohio State University, Columbus, Ohio, August 2023.

## Background (continued)

The HPV vaccine provides safe, effective, and long-lasting protection against cancer-causing HPV infections.<sup>7</sup> The age for routine HPV vaccination is between 11-12 years but can be started as early as 9. HPV vaccine schedule and dosing information for all age groups can be found on the [Centers for Disease Control and Prevention's \(CDC\) website](#).<sup>8</sup> Despite the HPV vaccine's safety and effectiveness, vaccine rates remain relatively low. According to the National Immunization Survey, nationally, and in Ohio, approximately 63% of 13 through 17-year-olds are up to date with their HPV vaccine.<sup>9</sup>

Given the relationship between oropharyngeal cancer and HPV, dental professionals can have an important role in reducing HPV-associated cancer rates through education and HPV vaccine promotion. Dental professionals should provide education to their patients and their patients' caregivers on the relationship between HPV and oropharyngeal cancer and the effectiveness and safety of the HPV vaccine. The dental health history form should include questions about their patients' HPV vaccine status to help initiate these conversations. In addition, dental professionals should make referrals for the HPV vaccine to a vaccine provider. In collaboration with the American Dental Association, the National HPV Vaccination Roundtable created [Cancer Prevention Through HPV Vaccination: An Action Guide for Dental Health Care Providers](#), which includes five action steps dental professional can take.



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7. [HPV vaccination and cancer prevention](#). CDC, November 2021.
  8. [HPV Vaccine Schedule and Dosing](#). CDC, November 2021.
  9. [Child and adolescent immunization coverage in Ohio](#). Ohio Department of Health, No date, Accessed July 2024.

## Methods

The survey instrument used was adapted, with permission, from a survey conducted in Michigan in 2018 by the Michigan Department of Health and Human Services. The survey was revised to make it applicable to Ohio dental professionals and reflect current HPV vaccine recommendations. The survey contained three sections: license and practice-related characteristics, oral cancer screening practices, and practices and knowledge related to HPV and the HPV vaccine. In addition, respondents were asked how they would like to receive educational resources on the topic and given a space to provide additional comments. The Ohio Dental Association (ODA) and the Ohio Dental Hygienists' Association (ODHA) provided input into the development of this survey and granted their support.

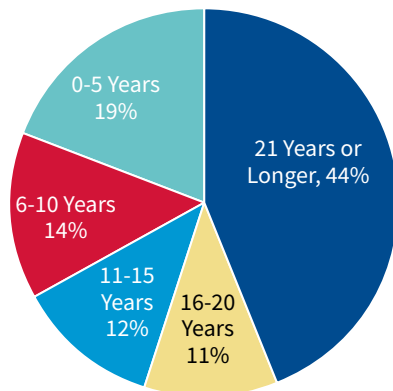
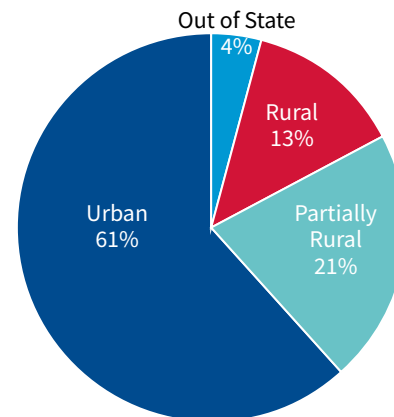
The survey was put into REDCap and distributed via email to a contact list of 15,086 dentists and dental hygienists (6,930 dentists and 8,156 dental hygienists) with active Ohio licenses. The list was obtained from the Ohio State Dental Board in May 2022. The survey was distributed three times between December 2022 and January 2023 by the ODH Oral Health Program. In addition, the ODA and ODHA promoted the survey to their members and encouraged them to take it. The survey received 460 responses, representing a 3% response rate. All respondents completed the survey; however, two responses were removed due to data quality issues, resulting in 458 total respondents.

The survey was anonymous, but respondents were asked to provide license and practice-related characteristics to address potential biases through data analysis. Respondents were asked to provide their license type (dentist vs. dental hygienist), years in practice, specialty, practice setting type, and primary practice site location. The survey respondents' demographics were compared to those of all Ohio dentists and dental hygienists statewide. To reduce data biases that may have arisen due to the low response rate, post-survey weighting was applied to license type and years in practice, making the sample match that of statewide dental professionals. Weighting was unable to be applied to specialty and practice setting type due to the selection choices differing between the two data sets. However, through data analysis, it was determined that these two demographics closely match between the survey respondents and statewide dental professionals. In addition, the sample was unable to be weighted for geographic location due to the high number of respondents (8%) who left that question blank.

### Survey Respondents' Characteristics

License Type	Major Area of Focus or Specialty	Practice Setting Type
47% Dentist	78% General Practice	51% Solo Practice
53% Dental Hygienist	5% Dental Public Health	34% Group Practice or Partnership
	5% Pediatric Dentistry	5% Health Center (CHC/FQHC/FQHC Look-Alike*)
	3% Periodontics	5% Academic Institution
	3% Education	5% Other
	6% Other	

\* CHC/FQHC/FQHC Look-Alike: Community Health Center/Federally Qualified Health Center (FQHC)/FQHC Look-Alike.

**Years in Practice****Practice Site Location**

\* There are 37 missing values/nonresponses for practice site location.

## Survey Results

Results that are statistically significant have an asterisk (\*) after them. All results reported as statistically significant are based on a 90% confidence level. In addition, results presented in this report based on a question in which five or more respondents chose to skip the question, are noted with their results.

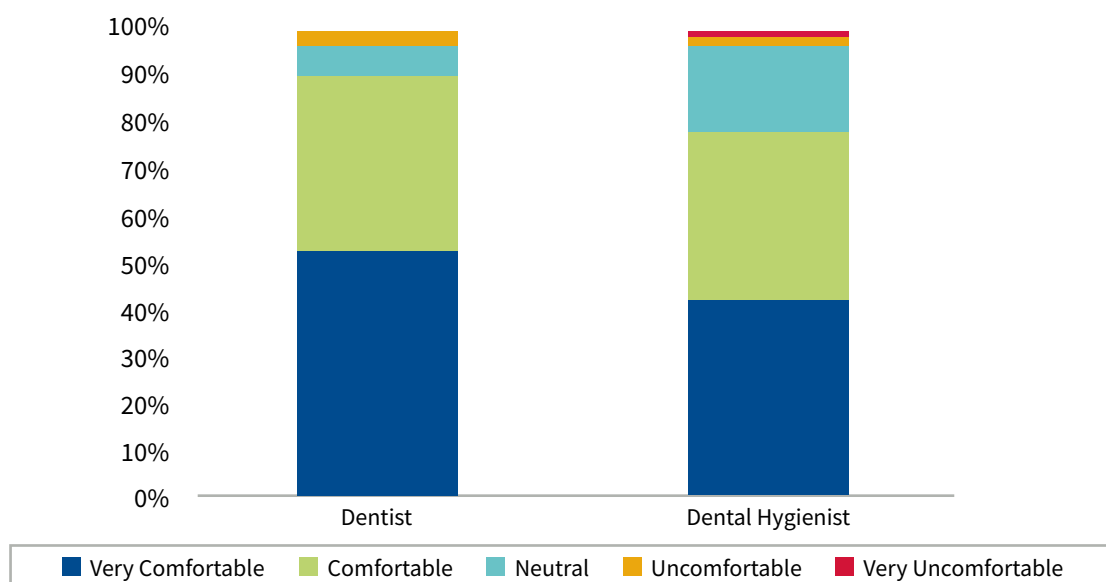
## Oral Cancer Screening Practices

### Comfort Level with Performing an OCS

Overall, 84% of dental professionals are comfortable or very comfortable with performing OCSs, with 36% being comfortable and 48% being very comfortable.

- Dentists are significantly more comfortable performing an OCS than dental hygienists; 55% of dentists report being very comfortable vs. 42% of dental hygienists.\*

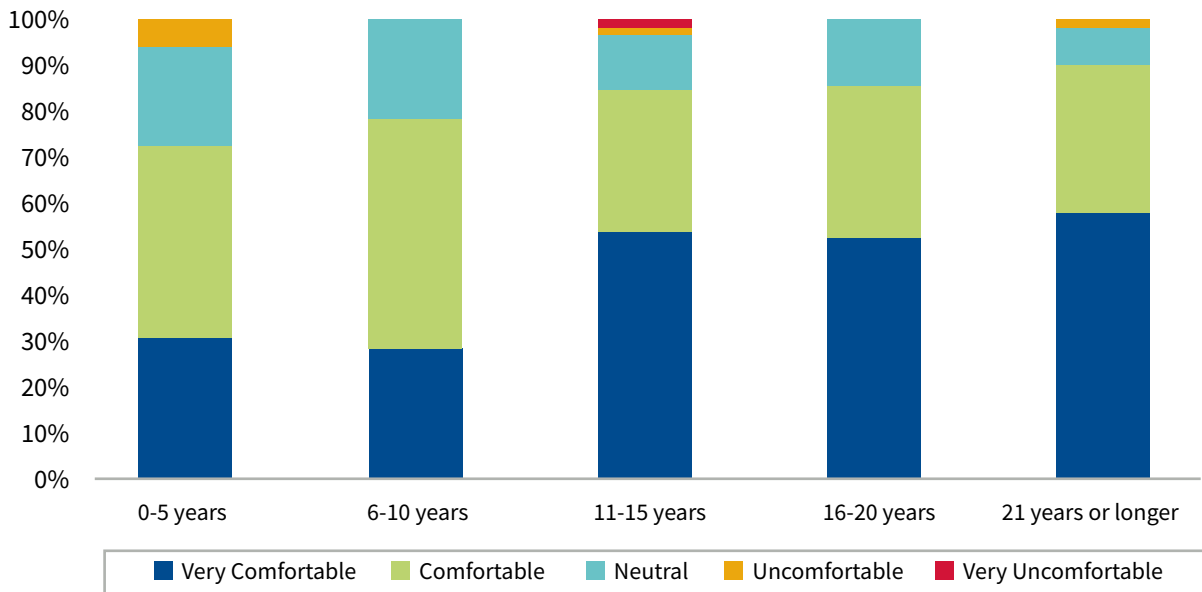
**Dentists are more comfortable performing an OCS than dental hygienists.**





Dental professionals with 10 or fewer years' experience are significantly less comfortable with performing OCSs compared to those with 11 or more years' experience, reporting a statistically lower proportion being "very comfortable."

**Less experienced providers are less comfortable with performing OCSs compared to more experienced providers.**



### Frequency of Performing an OCS

Among those who perform an OCS, 96% of dental professionals perform an OCS at least once per year.

Twenty dental professionals, five dentists and 15 dental hygienists, reported that they do not perform OCSs, citing the main reasons as considering it outside their scope of practice or dental hygienists believing that dentists will complete the screenings.

## Practices When Performing an OCS

Respondents were asked to indicate the areas of the mouth checked and the techniques used when performing an OCS. This question had 12 missing values.

Areas checked and techniques used*	Percentage of Respondents
Tongue, using a gauze square to pull the tongue outwards.	92%
Lips and cheeks, using bidigital palpation with the thumb and index finger.	83%
Floor of the mouth, using simultaneous palpation with fingers of each hand in opposition.	76%
Oropharynx, using depression of the tongue.	68%
Area under the mandible and along the neck, using bilateral palpation.	62%
Hard palate, using single digit palpation.	56%

\*These areas and techniques are recommended by the [American Dental Association](#).

- Dentists and dental hygienists reported that they frequently check various areas of the mouth and neck when performing an OCS. However, only 35% indicated that they check all six recommended areas, and 23% check five areas.
- The most commonly missed areas during an OCS are the hard palate and under the mandible along the neck; only 56% and 62% of dental professionals, respectively, check these areas. The tongue is the most common area checked (92%).

## Actions Normally Taken After Performing an OCS, and Finding a Suspicious Lesion

Dental professionals were asked to indicate which action(s) they take when finding a suspicious lesion; all indicated they take some action. After finding a suspicious lesion, 85% of dental professionals reported they make a referral to an oral surgeon, primary care provider or other specialist, and 54% reported they re-examine the patient in two weeks. Some dental professionals reported doing both: making a referral and re-examining the patient in two weeks.



## HPV and HPV Vaccine Knowledge

To assess their knowledge of HPV and the HPV vaccine, respondents were asked to indicate “True” or “False” to a series of statements. At the time of the survey, all statements were true.

Statement	Percentage with Correct Responses
HPV infection can cause cancer in the back of the throat, including the base of the tongue and tonsils (called oropharyngeal cancer).	90%
Most children who are 11 or 12 years old should get two shots of the HPV vaccine six to 12 months apart.	75%
The HPV vaccine is recommended for everyone through age 26.*	65%
About one in four individuals are currently infected with HPV in the United States.	61%
In some cases, the HPV vaccine is recommended for individuals through age 45.	44%
Adolescents who receive their two shots less than five months apart will require a third dose of the HPV vaccine.	19%

\*This question had eight missing values.

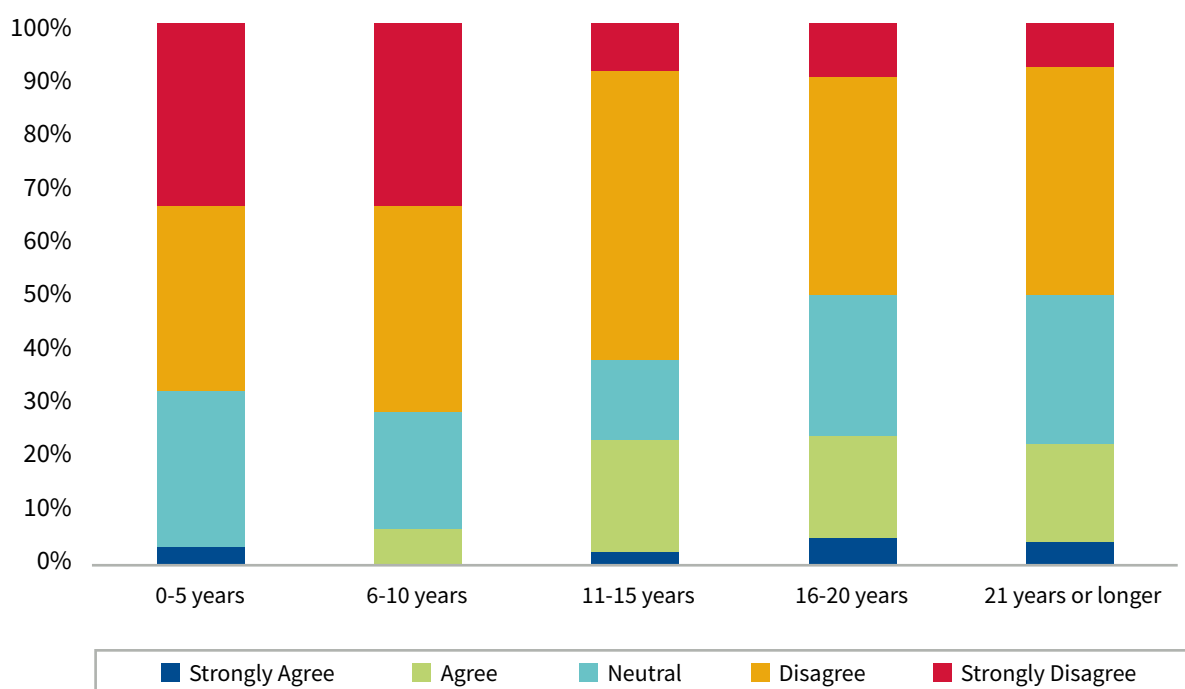
- Most (90%) dental professionals are aware that HPV infection may cause oropharyngeal cancer. However, they are less knowledgeable on details about the HPV vaccine schedule. Only 19% knew that adolescents who receive their two shots less than five months apart will require a third dose of the HPV vaccine.
- Less than one third (29%) of dental professionals answered five or more questions correctly.
- Dental professionals with five or fewer years’ experience have the least knowledge, with only 19% answering five or more questions correctly.
- Dentists and dental hygienists are relatively equal in HPV and HPV vaccine knowledge.

## Confidence in Knowledge about HPV and the HPV Vaccine

Dental professionals were asked whether they had adequate knowledge about the HPV vaccine to discuss it with patients and parents.

- Most dental professionals (57%) are not confident about their knowledge of the HPV vaccine, while only 17% feel they have adequate knowledge to discuss it.
- There is no significant difference between dentists and dental hygienists in whether they feel they have adequate knowledge about the HPV vaccine to discuss it with patients and parents.
- Aligning with the HPV knowledge assessment questions, dental professionals with fewer years of experience believe they lack adequate knowledge about the HPV vaccine.

**A lower proportion of less experienced providers strongly agree/agree that they have adequate knowledge about the HPV vaccine compared to more experienced providers.**



## HPV Vaccine Practices and Attitudes

### Respondents were asked which patients they routinely ask about or advise to receive HPV vaccines.

- Overall, the majority (85%) of dental professionals do not routinely ask about or advise patients to receive the HPV vaccine. Children and adolescents (7%) and their parents (7%) are more likely to be routinely asked or advised, compared with other patients.
- Dentists are more likely to discuss the HPV vaccine than dental hygienists (20% vs. 10%), though the proportion of either dental professional routinely discussing it is still small (15%).\*
- Experienced dental professionals with 16 or more years' experience are more likely to routinely ask or advise patients about the HPV vaccine.

### Opinions about the HPV Vaccine

Dental professionals were asked to indicate to what extent they agree or disagree with the following statements about HPV and the HPV vaccine. Results highlighted in blue are the highest for each category.

Statement		Agree or strongly agree	Neutral	Disagree or strongly disagree
Dental providers should discuss HPV vaccines with their patients.	Overall	35%	50%	15%
	Dentists	40%	49%	11%
	Dental Hygienists	31%	50%	19%
There is adequate time to discuss HPV vaccines during my office's dental appointments.	Overall	32%	25%	43%
	Dentists	37%	30%	33%*
	Dental Hygienists	28%	21%	52%*
I have questions about the HPV vaccine.	Overall	57%	26%	17%
	Dentists	51%	28%	21%
	Dental Hygienists	62%	25%	13%
I am comfortable discussing the HPV vaccine with patients and parents.	Overall	24%	25%	51%
	Dentists	29%*	29%	41%*
	Dental Hygienists	19%*	22%	59%*
I know where to send patients to get the HPV vaccine.	Overall	55%	16%	29%
	Dentists	56%	16%	28%
	Dental Hygienists	54%	16%	30%

\*Indicates a statistically significant difference between dentists and dental hygienists for that response at  $p < 0.1$ .

### **Dental professionals should discuss HPV vaccines with their patients.**

- Only one-third of dental professionals agreed or strongly agreed that dental professionals should discuss the HPV vaccine with their patients or parents. Nearly half of the dental professionals held a neutral attitude.
- Dental professionals with five or fewer years of experience reported the lowest agreement (26%) that dental professionals should discuss the HPV vaccine with their patients or patients' parents, compared to other age categories.

### **There is adequate time to discuss HPV vaccines during my office's dental appointments.**

- Discussing HPV vaccines is constrained by the time limits of dental appointments, with only 32% agreeing they have adequate time for these discussions and one-fourth holding a neutral attitude.
- Dental hygienists were more likely to report not having enough time. More than half (52%) of dental hygienists reported not having enough time, compared to 33% of dentists.\*

### **I am comfortable discussing the HPV vaccine with patients and parents.**

- Overall, only 24% of dental professionals reported being comfortable discussing the HPV vaccine.
- More dentists (29%) reported being comfortable than dental hygienists (19%).\*
- Dental professionals with 21 or more years' and 16-20 years' experience were more comfortable, with 30% and 26% reporting being comfortable with discussing the HPV vaccine with patients and parents.

### **I know where to send patients to get the HPV vaccine**

- More than half (55%) of dental professionals agree or strongly agree they know where to send patients to receive the HPV vaccine. This did not vary by type of dental professional, years of practice, nor type.

## **Educational Resources**

### **Dental professionals were asked to suggest educational resources on oral cancer, HPV, and the HPV vaccine.**

- Educational resources on oral cancer, HPV, and the HPV vaccine are widely welcomed by respondents. Only 1% indicated that educational resources are not needed.
- The majority of respondents prefer online CE courses (86%). The preference for educational resources was chosen by more than half of the respondents, such as information pamphlets and fact sheets (65%), webinars (60%), in-person CE course (57%), and professional resources from American Dental Association (51%).

## Other Feedback

**Dental professionals were asked to provide other comments on their office's/clinic's practice for screening for oral cancer, knowledge and/or promotion of HPV-related cancers and the HPV vaccine.**

- Of the 58 comments received regarding the HPV vaccine, 41 were characterized as positive and 17 of the comments reflected opposition to the HPV vaccine or noted barriers to promoting it. Below are some examples.
- Positive feedback:
  - While I do not now discuss this vaccine with people, I do think I should learn more about it and begin to discuss. I have several patients who have had oral cancers due to HPV, so can easily inform parents about the risks involved with HPV.
  - HPV is hard to bring up when I do not know enough about the vaccine to discuss, and I have no written material to give to patients.
  - I have diagnosed 6 HPV lesions this year alone. Primarily older adults. It is important to get this information out to providers in our field.
  - Oral cancer screening should be done, and CE for Oral cancer screening should be offered more and online as most providers are not going to in person CE. A free course for ODA members would be a good way to get the most providers updated on the increased risk.
  - This survey alone makes me want to gather more information about the HPV vaccine so that I can have more discussion with my students, patients, and parents about the HPV vaccine.
- Expressed opposition/ barriers:
  - I ran into so much push back from patients and staff when asking about COVID vaccines that it gives me pause to ask about another vaccine.
  - Due to the increased resistance for vaccines in general and parent/patient apprehension towards any new vaccine and preventive recommendations, it is hard to convince parents and patients for evidence-based recommendations like fluoride, diet and vaccines.
  - The insurance industry is shortchanging reimbursements for all of these extra time demands for a routine exam.

## Limitations of the Survey

The assessment's biggest limitation was the low response rate. A low response rate may lead to nonresponse bias, particularly if there are substantial differences in the opinions and knowledge on the topic between the respondents and non-respondents. Nonresponse bias was reduced through post-survey weighting for license type and years in practice; however, as stated in the Methods section, the data could not be weighted for specialty, practice setting type, and primary practice site location.

Another limitation was the lack of responses for the primary practice site location question. Thirty-seven, or 8%, of respondents chose not to answer the question asking for the county name of their primary practice site. As rural counties have fewer dental professionals, respondents from rural counties may have been reluctant to identify their county, possibly due to a concern about losing anonymity. However, after analysis, geographic distribution closely matched between the survey respondents and statewide dental professionals, with the exception of dental professionals practicing in rural counties. Rural providers may be underrepresented in the results presented in this report.

For future, similar assessments, offering incentives for survey completion may increase the response rate. Similar assessments have proven incentives successfully increase response rates. To lessen participants skipping a question about practice site location, providing respondents with a list of counties classified as rural, partially rural, urban, and out of state and asking them to respond with their counties' classification, rather than their county name, may reduce the number of respondents skipping that question. This method would provide more anonymity for providers from areas with fewer providers.



## Next Steps/Recommendations

The assessment results lead to the following recommendations:

### Increase Training and Education Resources:

- Focus on HPV knowledge: Develop targeted workshops and continuing education courses for dental professionals, especially online, to enhance their understanding of HPV, including vaccine schedules and the connection between HPV and oropharyngeal cancer.
- Develop comprehensive materials: Create and distribute educational resources such as pamphlets, and fact sheets focused on oral cancer, HPV, and the HPV vaccine to both dental professionals and patients.
- Increase OCS, HPV, and HPV vaccine training and education for students: Provide additional training and resources to dental and dental hygiene students on performing OCSs, HPV, and the HPV vaccine to increase knowledge and confidence.

### Enhance Comfort and Routine Integration:

- Improve dental professional communication techniques: Train dental professionals on promising communication practices for educating patients and parents about HPV and the HPV vaccine such as strongly endorsing the HPV vaccine; emphasizing that the vaccine is cancer prevention; delivering the HPV vaccine recommendation early, starting at age nine; and delivering HPV vaccine recommendations for all adolescents, not just those perceived to be “at risk.”
- Provide motivational interviewing training: Provide training on motivational interviewing techniques for HPV vaccine recommendation as it has been proven to increase vaccine acceptance and address vaccine hesitancy amongst patients and parents. Incorporate HPV Vaccine Discussions: Integrate discussions about the HPV vaccine into routine patient care protocols and training to increase the frequency of these conversations.

### Address Dental Professionals’ Attitudes:

- Facilitate discussions: Provide evidence-based information through supportive discussions among dental professionals about the importance of HPV vaccination and its role in overall health to shift attitudes towards more proactive engagement.
- Assess dental professional needs: Conduct further assessments to understand the specific barriers dental professionals face in discussing HPV vaccines with patients and address these in training and support programs.



## Oral Cancer, HPV, and HPV Vaccine Resources

- [American Dental Association \(ADA\): Action Guide for Dental Health Care Providers](#)
- [ADA: HPV and Oral Cancer](#)
- [ADA on-demand free webinar: Preventing HPV Cancers in Action, Part 1: The Critical Role of the Dentist](#)
- [CDC Head and Neck Cancer Basics](#)
- [CDC HPV Vaccine Recommendations](#)
- [CDC: Top 10 Tips for HPV Vaccination Success](#)
- [National HPV Roundtable](#)
- [The Oral Cancer Foundation](#)
- [National Cancer Institute: HPV and Cancer](#)
- [The American Cancer Society in Ohio](#)