University of Florida College of Dentistry’s “Case of the Month”: Evaluating a Web-Based Continuing Dental Education Course for Clinical Oral Pathology


Abstract: Over the last decade, online continuing dental education (CDE) has seen a major transformation in the way it is delivered, marketed, and accessed. The University of Florida College of Dentistry (UFCD) developed and evaluated a web-based CDE format (“Case of the Month”) that specifically focused on clinical oral pathology. Over a four-month period, three oral pathology cases were presented monthly (a total of twelve cases overall) using a clinical pathologic conference format including a brief patient history, along with pictures and radiographs needed to make a treatment diagnosis. A differential diagnosis in the form of a question was developed, followed by a detailed description and rationale describing why the option was correct or incorrect. At the conclusion of the case of the month, respondents completed an online survey that ascertained their needs, expectations, attitudes, level of clinical knowledge gained, and experience with the online environment. The primary purpose of this study was to evaluate the expectations and attitudes of these CDE participants. Results suggested that the participants’ needs and expectations were generally met: they were able to navigate the website with ease and found the design to be appealing. The biggest disadvantage reported was the inability to communicate with others, including the instructor, while viewing the case, and more respondents would like to have seen some more general/common oral pathology information.

This research was funded by a grant from the U.S. Department of Health and Human Services, Health Resources and Services Administration, Office for the Advancement of Telehealth (D1BTH03696-01-00).

Key words: continuing dental education, web-based instruction, clinical oral pathology

Submitted for publication 6/20/06; accepted 10/10/06

In an attempt to enhance its Statewide Network for Community Oral Health to include expanded capabilities in the area of online continuing dental education (CDE) and to promote lifelong learning, the University of Florida College of Dentistry (UFCD) received a teledentistry grant from the U.S. Department of Health and Human Services’ Health Resources and Services Administration through the Office for the Advancement of Telehealth (OAT). Teledentistry is a combination of telecommunications (including the use of computers and the Internet) and dentistry, involving the exchange of clinical information and images over remote distances. One of the principal goals of the UFCD grant is to develop and evaluate web-based CDE educational materials for dental students, dental residents, faculty, and practitioners. This type of asynchronous distance education provides dental schools and their faculty the ability to offer content to dental professionals and students at a place and time convenient for the end user. Online CDE has seen a transformation in its distribution to the dental provider community, not only in its availability, but also in the way it is accessed, delivered, and marketed. An advantage of the online CDE is that it obviates traveling to and from continuing education lectures. Often dentists do not have the extra time necessary to access CDE courses due to family and job responsibilities. In fact, when considering all of the costs that a professional has to consider for a CE course (travel, lodging,
food, and time away from work), online CDE has many advantages as compared to traditional CDE. Online CDE courses have been reported to usually meet the needs and expectations of the participants, and online CDE participants have reported that it is convenient to use and provides easy access.

As more dental schools provide some form of distance education and with the anticipation of one-time set-up costs, online CDE may be more beneficial for recipients now than before. A type of online CDE format is case-based, allowing the student to progress through the screens at his or her own pace according to his or her own level of expertise.

The UFCD designed an online CDE format called “Case of the Month.” The focus of the UFCD web-based CDE was clinical oral pathology. This case-based content contained a series of presentations of differing complexities that allowed the participant to proceed at his or her own pace. An extensive search on the World Wide Web found only a small number of sites at dental schools that specialized in oral pathology/medicine web-based CDE. The UFCD Case of the Month was designed to serve dental professionals by posting three new oral pathology/medicine cases on a monthly basis at no cost. However, for a twenty-five dollar fee, participants could receive one hour of CDE for the completion of the three cases. To advertise the Case of the Month, advertisements were placed in the Florida Dental Association’s journal, which appeared once over the four-month study period. The Case of the Month was also highlighted on the UFCD website. Further, email announcements were made regarding the installation of the Case of the Month that went to faculty, dental students, residents, and UFCD alumni.

Ideal Context to Implement Oral Pathology/Oral Medicine CDE

The diagnosis and treatment of oral soft tissue lesions can be challenging to both physicians and dentists. Likewise, there has been considerable incongruity among dental educators in oral pathology to tailor the curriculum so that it can be pertinent to dental students and graduate students in dental specialties. UFCD has several full-time faculty in the oral diagnostic sciences, including board-certified oral and maxillofacial pathologists, faculty in oral medicine and clinical oral oncology, and board-certified specialists in oral and maxillofacial radiology. These individuals are located in the UFCD Department of Oral and Maxillofacial Surgery and Diagnostic Sciences and represent a recognized group of academicians who are interested in extending their clinical expertise beyond UFCD to provide diagnostic clinical knowledge to practitioners, residents, and students who may otherwise have to travel long distances for CDE. The section of Oral and Maxillofacial Pathology maintains a biopsy service that accesses approximately 6,500 new cases each year. All of the diagnostic sciences faculty maintain private practices in the UFCD and treat patients sent to them with challenging problems in the oral cavity. The website for the Case of the Month also listed email addresses and detailed contact information for the oral pathologists in order to facilitate access for individuals interested in providing cases for discussion and/or consultation. In addition, information on submitting both interesting and difficult cases, inquiring about advice on treatment and/or management of difficult or complicated cases, and submitting tissue for microscopic examination and diagnosis was provided for clinicians.

To better serve the dental professionals who accessed the UFCD Case of the Month and to receive important feedback on ways to better tailor the web-based learning environment, a survey was designed to elicit important feedback to be used in continuing improvement of the case and to evaluate the participants’ encounters with the courses. The primary focus of the survey was to evaluate the expectations and attitudes of these CE participants. Respondents identified changes they would like to see made; factors that attracted them to the course; how knowledgeable they believed they were after participating; and how they learned about this CE opportunity. Open-ended questions were designed to elicit perceived disadvantages of this educational format and to identify other course topics of interest. Participants were also asked to rate their level of sophistication with computer usage, as well as to provide their specialization and the location at which they accessed the course.

The UFCD Case of the Month

Over a four-month period, the UFCD website presented a total of twelve oral pathology/medicine cases (three new cases were posted each month), which used a format that included a patient’s chief
complaint and medical/dental history, along with clinical photos, radiographs, and a brief description of microscopic features, where appropriate, that were required to make a definitive diagnosis. On a monthly basis, three oral pathology cases were selected from patients seen in the UFCD biopsy and clinical oral pathology/oral medicine service. These cases were selected based on availability of adequate clinical, medical, and background information on the patient and after the patient had consented to have his or her photograph and history used for this purpose. Specifically, cases were chosen that would be of interest and importance to a wide range of dental practitioners. If a new entity or threat became known, we employed the cases as a mechanism to alert clinicians. We also used the cases to remind dental practitioners that cancers often start as innocuous lesions and to remind them that all lesions are not inflammatory. Another reason for the selection was that the cases needed to be somewhat complex and requiring 1) interpretation of x-rays, 2) evaluation of clinical features, and 3) a thorough review of dental and medical histories. Then, the submitted clinical photos and/or x-rays had to be of good quality.

Every reasonable attempt was made to conceal patient identity such as covering eyes and other identifiable marks. These cases were presented using a clinical pathologic conference format with a brief patient history, along with pictures and radiographs needed to make a definitive diagnosis. For each case, a series of diagnostic options were presented in the form of a multiple-choice question with one correct answer. Users of the module were requested to select the best diagnosis based on the information provided. After selecting and submitting a response, users received feedback in the form of an extensive description and rationale for why the option was correct or incorrect. If a user clicked on a response that was incorrect, then the screen would emerge indicating “incorrect” with an explanation. The user would then hit the continue button, which, in turn, returned him or her to the case and the choice options. This scenario continued until the user selected the correct response. In other words, the user could not advance to the second case until responding correctly to the first case. Whenever the user selected the correct response, he or she saw a paragraph stating that response was correct with an explanation. Then, the user hit the continue button and advanced to the next case.

The present study reports data from months one to four of the UFCD Case of the Month.

The first month had three cases that focused on squamous cell carcinoma, pernicious anemia, and Langerhan cell disease; the second month cases centered on metastatic carcinoma (lung primary), hemodialysis associated amyloidosis (acquired macrogosia), actinic keratosis, and lip chewing; the third month cases focused on nasopalatine duct cysts (incisive canal cyst), Fordyce granules, and ectopic geographic tongue; and the fourth month cases focused on central giant cell granuloma, pyogenic granulomas, and verrucoid leukoplakia. Figure 1 presents an actual image of a case as it appears on the online module.

Methods

An anonymous online survey of twenty-four questions (eighteen close-ended and six open-ended) was developed and included the following categories: 1) demographic/background (six); 2) expectations and attitudes (six); 3) clinical knowledge enhancement (five); 4) suggested modifications to the case (five); and 5) CDE credit (two). Some of these questions were modified and adapted from Spallek et al.’s survey of web-based dental CE courses. At the conclusion of each UFCD Case of the Month, respondents were asked to complete this online survey. For those respondents who desired to obtain the one-hour CDE credit, the completion of the survey was mandatory.

The close-ended questions were based on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). For the purposes of the presentation, we collapsed the categories into 1) strongly disagree/somewhat disagree=disagree; 2) neither disagree nor agree; and 3) strongly agree/somewhat agree=agree.

The research protocol received exempt status from the University of Florida’s Health Center Institutional Review Board on April 13, 2005 (IRB Number: 157-2005).

Results

Out of a total 193 participants who visited the UFCD Case of the Month website during the four-month period, ninety-eight responded to the survey, resulting in an overall response rate of 50.8 percent. The respondents spent an average of 11.9 minutes per month viewing and completing the cases. The time spent ranged from an average of 10.91 minutes
in September to 12.35 minutes in July. A majority of the respondents (53.4 percent) were repeat users (i.e., over the four-month period, they viewed and completed the cases for at least two of the four months). In fact, 20.3 percent of respondents completed three months of cases, while 11.3 percent completed all four months of cases.

Respondent Background Characteristics. Table 1 presents a summary of the respondent background characteristics measured along several factors. The majority (eighty-eight; 90 percent) were dentists. Most of the eighty-eight dentist participants (forty-six; 46.9 percent) were general practitioners, but twelve (12.2 percent) were periodontists and ten (10.2 percent) were oral and maxillofacial surgeons. Nine of the ten non-dentists were dental students, and the tenth was a dental hygienist. An overwhelming majority of the participants were from Florida (eighty-three; 85 percent). Fourteen respondents (14 percent) were from ten other states from Georgia to Arizona. One (1 percent) accessed the course from outside the United States. Fifty-two participants (53 percent) accessed the case from their offices, while forty-three (44 percent) accessed it from their own homes and the remaining three completed it from a library. The most common way that respondents learned about the particular oral pathology course was through the UFCD homepage (twenty-six; 27 percent), while the second and third most common avenues were personal recommendation/word of mouth (twenty-four; 25 percent) and email/listserv (twenty-two; 22 percent), respectively.

When respondents were queried about their level of sophistication as a computer user, forty-two (43 percent) considered themselves to be sophisticated, while forty-six (47 percent) did not.

Figure 1. Example of a case as it appeared on the online module
percent) indicated that they were neither sophisticated nor unsophisticated in their computer use. Ten respondents (10 percent) considered themselves to be unsophisticated to very unsophisticated in their computer use.

In an open-ended format, we asked respondents to indicate the most important reason they were attracted to the UFCD Case of the Month. The two most common answers related to accessibility (i.e., it was convenient, easy, and practical) (twenty-eight; 29 percent) and level of knowledge (i.e., improve knowledge of pathology; broaden my knowledge base) (twenty-seven; 28 percent).

### Respondent Expectations and Attitudes

Table 2 displays a summary of the findings related to the respondent expectations and attitudes. Respondents were asked if the overall expectations of the course were met, and eighty-nine (91 percent) agreed with this statement. Ninety-one respondents (93 percent) agreed that they would consider recommending the Case of the Month to colleagues. When asked if they were able to navigate through the website with ease, eighty-eight respondents (90 percent) agreed. Likewise, eighty-eight (90 percent) agreed that the website design was appealing. Only seven respondents (7 percent) preferred that the case be presented in paper format. A majority of the respondents (sixty-nine; 70 percent) agreed that they were comfortable with submitting cases online.

### Respondent Clinical Knowledge Enhancement

Table 3 presents the results from a series of questions that focused on the extent to which the Case of the Month enhanced their clinical knowledge: 1) eighty-five (87 percent) agreed that the information received from the UFCD Case of the Month will be helpful in their practice; 2) eighty-two respondents (84 percent) agreed that the Case of the Month was suitable to their area of dentistry; 3) seventy-eight respondents (80 percent) agreed that, after viewing the particular Case of the Month, they felt more confident clinically about the specific topic; and 4) sixty-five respondents (66 percent) agreed that the knowledge gained from reviewing the Case of the Month will help improve the quality of their practice. Another question oriented toward knowledge, but which had different response options, queried how knowledgeable the respondents believed they were on the topic after reviewing the Case of the Month: 1) eighty-five (87 percent) agreed that the information received from the UFCD Case of the Month will be helpful in their practice; 2) eighty-one respondents (83 percent) agreed that the Case of the Month was suitable to their area of dentistry; 3) seventy-eight respondents (80 percent) agreed that, after viewing the particular Case of the Month, they felt more confident clinically about the specific topic; and 4) sixty-five respondents (66 percent) agreed that the knowledge gained from reviewing the Case of the Month will help improve the quality of their practice. 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### Suggested Changes

We asked the respondents what aspects of the Case of the Month should be...
modified. As shown in Table 4, only fourteen respondents (14 percent) believed that more in-depth material should be provided (14 percent agreed, 54 percent disagreed, 32 percent neither agreed nor disagreed). The second and third questions focused on the extent to which respondents needed a greater breadth of information. Six respondents (6 percent) felt that the case content should be more universal (6 percent agreed, 56 percent disagreed, 38 percent neither agreed nor disagreed), while three respondents (3 percent) thought that the material presented should have provided broader coverage of the actual conditions presented (3 percent agreed, 57 percent disagreed, and 40 percent neither agreed nor disagreed). We also asked participants an open-ended question about what other course topics they would like to see covered. Slightly over two-thirds (sixty-seven; 68 percent) did not provide an answer. The most common responses provided were more general/common oral pathology cases (5 percent). The second most common area provided were radiologic aspects of oral pathology (4 percent). Finally, in an open-ended format, respondents were asked what they felt was the biggest disadvantage to the format of the course material. The most common disadvantage was the lack of opportunities to ask questions, interact with others, or to get immediate access to questions about the case (thirteen; 13 percent). Thirty-seven (38 percent) respondents indicated that there was no disadvantage to this format, while thirty-five (36 percent) respondents did not answer the question.

**CDE Credit.** Table 5 presents a summary of characteristics for those who completed the Case of the Month for CDE credit. Approximately one-third (thirty-one; 32 percent) of the respondents completed the cases for CDE credit, while 68 percent did not. Of those who completed it for CDE credit, twenty-three (74 percent) respondents indicated that they were able to navigate it with ease to obtain CE credit.

A bivariate analysis was performed to compare CDE credit completers versus non-CDE credit completers by respondent expectations and attitudes and respondent clinical knowledge enhancement items. None of the associations were significant at the .05 level.

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<th>Table 2. Respondent expectations and attitudes</th>
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<tr>
<td>Respondent Expectations and Attitudes</td>
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<tr>
<td>Overall, my expectations for the Case of the Month were met.</td>
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<tr>
<td>I would consider recommending this Case of the Month to colleagues.</td>
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<tr>
<td>I was able to navigate through the Case of the Month website with ease.</td>
</tr>
<tr>
<td>The Case of the Month website design was appealing.</td>
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<tr>
<td>I prefer the Case of the Month in paper format.</td>
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<tr>
<td>I am comfortable with submitting cases online.</td>
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<th>Table 3. Respondent clinical knowledge enhancement</th>
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<tr>
<td>Respondent Clinical Knowledge Enhancement</td>
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<tr>
<td>The information received today will be helpful in my practice.</td>
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<tr>
<td>The Case of the Month was suitable to my area of dentistry.</td>
</tr>
<tr>
<td>As a result of this Case of the Month, I feel more confident clinically about the topic.</td>
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<tr>
<td>The knowledge gained from this Case of the Month will help improve the efficiency of my practice.</td>
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How Knowledgeable the Respondent Was After Reviewing the Case of the Month

| Very Knowledgeable/Knowledgeable | 67 (68.4 percent) |
| Somewhat Knowledgeable | 29 (29.6 percent) |
| Other | 2 (2.0 percent) |
Our study reported on the development and evaluation of a web-based CDE tool (“Case of the Month”) that focused on specific aspects of clinical oral pathology. Two UFCD board-certified oral and maxillofacial pathologists developed the course material. A differential diagnosis in the form of a series of clinical options was developed, followed by a detailed description and rationale for correct and incorrect responses. After the respondents completed the clinical oral pathology cases, they had to complete an online survey before obtaining one hour of CDE credit, which cost twenty-five dollars. For those who opted not to earn CDE credit, respondents were encouraged to complete the survey. The survey collected demographic and background information and ascertained information about the respondents’ needs, expectations, attitudes, level of clinical knowledge gained, and experience with the online environment.

A diverse group of dentists accessed the Case of the Month, with general practitioners using it most often, followed by periodontists and oral and maxillofacial surgeons. The results of this study suggest that the participants’ expectations of the course were met and that their attitudes were positive in the sense that an overwhelming majority of them would consider recommending it to their colleagues. Respondents indicated they were satisfied with the design and aesthetic features and were able to navigate the system with ease. This finding is especially encouraging since only 43 percent of the respondents considered themselves to be sophisticated computer users.

In terms of the extent to which the respondents enhanced their clinical knowledge, the responses varied in their level of agreement. Even though 87 percent of the respondents agreed that the informa-
tion received from the cases was helpful in their practice, substantially fewer (66 percent) indicated that the knowledge gained would help improve the efficiency of their practice. However, this lower number may indicate that the users do not view that this new knowledge gained saves their practice time.

Approximately one-third (32 percent) of the respondents completed the cases for CDE credit. About three-quarters of them (74 percent) were comfortable navigating the system to obtain the CDE with ease. We did find, however, that CDE credit completers were less likely than the non-CDE credit completers to believe that the courses would improve the efficiency of their practice. Perhaps the CDE credit completers had greater expectations because they paid for the course.

The survey respondents indicated that the biggest disadvantage to the Case of the Month format was the lack of interactivity and the lack of immediate access to faculty regarding questions about the case. This finding is consistent with previous research, which indicated that users perceive online courses to be less than ideal when there is no discussion forum or no opportunity for questions and answers.\(^5,6\) Future implementations could possibly employ a real-time mechanism for instructors to answer questions through a forum such as a chat room. Also, the quiz could be modified so that immediate feedback options are provided to the respondents.\(^6\)

Also, as indicated previously, the website for the Case of the Month listed email addresses and detailed contact information for the pathologists to facilitate access for individuals interested in providing cases for discussion and consultation. Over the four-month period investigated in this study, we received only three cases. Due to this small number, we did not believe it was feasible to report and discuss these findings.

### Limitations

This study has a few limitations that deserve mention. First, we obtained a 51 percent response rate, which is lower than ideal. With the current data, we were unable to explore the extent to which there was nonresponse bias or to determine what characteristics were associated with nonresponse. This response rate was higher than in a previous similar study, which yielded a response rate of 39 percent and used various tactics to increase the response rate.\(^3\) The response rate could be related to the particular topics presented in the cases and the fact that those not taking the course for CDE did not have to complete the survey. Second, we did not employ specific techniques to increase the response rate, such as Dillman’s Tailored Design Method,\(^10\) that has been employed in similar evaluations of web-based dental CE courses.\(^5\) For instance, following some of Dillman’s methods, future implementations could try to improve the response rate by convincing the participants in the opening correspondence that their information could shape future online CDE courses.\(^5\) Third, the respondents who completed the survey were predominantly from Florida (85 percent), the location where the case module was launched. Thus, the findings from this evaluation may not be generalizable to other regions in the country.

Fourth, we failed to include a question regarding the respondents’ age or year of graduation from dental school. In a study of the use of the Internet by dermatologists in three European countries, Gjersvik et al.\(^11\) found that age was inversely associated with Internet use. Similarly, Clark argued that dentists who enroll in online CDE are more likely to be younger than those who take traditional (i.e., lecture-based) CE courses.\(^6\) He based this rationale “on the fact that younger practicing dentists are likely to be more familiar with web-based instruction because they probably experienced this method of teaching during their schooling” (p. 615).\(^6\) Future research should examine the association between age and use of online dental courses. In addition, future use of the survey should include respondents’ rating of the oral pathology education received in their undergraduate education. Fifth, we did not use any type of a pretest in our online cases. Some previous research has advocated that a pretest could be used to assess the respondent’s current level of knowledge and then be used in evaluating their post-case responses. Future research may want to pretest prospective respondents to gauge their level of knowledge. Sixth, the current form of the Case of the Month did not have the capacity so that when a user selected a correct response, the incorrect responses did not automatically appear and the reason why they were incorrect. To get maximum benefit for users, further revisions should be modified so that the feedback and discussion for all options, correct or incorrect, are provided for each case.

Despite these limitations, the UFCD’s Case of the Month attracted a wide range of dental specialists, who heard about it in diverse avenues and wanted to learn about unique, online oral clinical pathology cases. The respondents overwhelmingly indicated
that the online courses were appealing, their attitudes were positive, and most of their needs were met. With a wider range of advertising and technology advances fostering more online training, an online CDE program with a clinical oral pathology focus similar to our study may be advantageous for future CDE endeavors. Also, the ease of use and high value placed on the cases might help foster lifelong learning in dental practitioners.

REFERENCES