



Internet usage by pediatric dental practices in Connecticut

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Abstract

Purpose: The aim of this study was to determine Internet usage by pediatric dental practices in Connecticut.

Methods: A seven-item anonymous survey was mailed to all the 64 pediatric dentists in private practice in Connecticut. Each survey form was mailed along with a stamped and pre-addressed return envelope. Frequency distribution analyses and chi-square tests were performed.

Results: The survey had a response rate of 73%. More than three-fourths of the pediatric dental practices were connected to the Internet. Seventy-two percent of the practices submitted third-party claims electronically. Almost all of the respondents did not use e-mail to communicate with patients or to discuss individual patient issues with other health care providers. Only two-fifths of the practices had a World Wide Web site.

Conclusions: Most of the pediatric dental practices in Connecticut were connected to the Internet. Electronic third-party claims submission was the predominant Internet service used by these practices. (*Pediatr Dent* 24:139-143, 2002)

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The recent phenomenal growth of the Internet, particularly the graphical user-friendly World Wide Web (WWW), is heralded to bring about significant changes in health care. This paper focuses on three aspects of the Internet as it relates to pediatric dental practice:

- Electronic third-party claims
- Electronic mail (e-mail)
- Practice Web site

Practice administration seems poised for a significant change with electronic claims submission replacing the current paper-based system. To ensure standardization, the U.S. Department of Health and Human Services has required that by October 17, 2002, all electronic dental claims must be processed using the Code on Dental Procedures and Nomenclature (CDT).¹ This addresses an issue that was raised by Wallin in 1992 who commented upon the need for "writing rules covering the operation of electronic claims transmission."²

"Increased use of e-mail by physicians, patients, and other health care organizations and staff has the potential to reshape the current boundaries of relationships in medical

practice."³ The asynchronous nature of e-mail is an advantage since the patient and the provider need not be available at the same time for the communication to take place, thereby eliminating the need for repeated attempts and "telephone tag."⁴ It has been claimed that proficiency in using e-mail for communication with patients is the most important "cybermedical" skill.⁵

The World Wide Web has become a source of health information for laypersons providing them with access to information heretofore unavailable except to health care professionals. Therefore, it has been remarked that "access to medical information via the Internet has the potential to speed the transformation of the patient-physician relationship from that of physician authority ministering advice and treatment to that of shared decision making between patient and physician."⁶ A study reported that three-quarters of primary caretakers of pediatric patients had access to the Internet and that one-third of them had specifically used the Web for obtaining medical information.⁷ It has been noted that patients seek health information from the Internet, which, in some instances, may be "grossly erroneous."⁵

Therefore, it has been suggested that health care providers “design their own Web sites that include links to other sites that they feel provide quality information to patients.”⁵

There exists no data documenting how pediatric dental practices are proceeding with the transition engendered by the advent of the Internet. Therefore, the objective of the present survey was to determine Internet usage by pediatric dental practices in Connecticut.

Methods

The list of pediatric dentists in active private practice in Connecticut was derived from the American Academy of Pediatric Dentistry’s 2000-2001 Membership Directory. The survey was sent by first-class mail to all the 64 pediatric dentists in private practice in Connecticut. Each survey form was mailed along with a stamped (first-class mail) and pre-addressed return envelope. The survey was anonymous in response and no follow-up mailing was done. Responses received within six weeks of the mailing were included in the data set.

The seven-item survey measured the following aspects of Internet usage by pediatric dental practices:

1. Internet connectivity;
2. Use of e-mail communication with patients (parents);
3. Use of e-mail communication to discuss individual patient issues with other health care providers;
4. Use of data encryption for e-mail communications;
5. Submission of third-party claims electronically, and the proportion of total third-party claims thus submitted;
6. Existence of practice Web site, and the proportion of new patients resulting from the Web site;
7. And finally, the demographic characteristics relating to the type of practice (solo/group), and the respondent’s gender and the decade of completion of pediatric dentistry training.

Frequency distribution analyses and chi-square tests were performed. Statistical significance was set at $P=0.05$.

Results

Forty-seven pediatric dentists completed and returned their survey forms, constituting a response rate of 73%. Almost two-thirds of the respondents were male by gender (64%). Most of the respondents were in group practice (57%) with the rest in solo practice (43%). Respondents who had completed their pediatric dentistry training in the 1970s formed the largest group (45%), followed by the 1980s (26%) and 1990s (23%) cohort (Table 1).

Seventy-seven percent of the respondents noted that their practices were connected to the Internet. Seventy-two percent of the respondents reported that their practices submitted third-party claims electronically. Among those who submitted electronic claims, 77% submitted 76% to 100% of their total third-party claims electronically.

Ninety-four percent of the respondents did not use e-mail to communicate with patients (parents). Not even one respondent used e-mail to communicate with other health

Table 1. Demographic Assessment of Internet Usage by Pediatric Dental Practices in Connecticut

Characteristic	Practice type		Practitioner cohort*	
	Solo (n=20)	Group (n=27)	1970s (n=21)	1980s+1990s (n=23)
Practice connected to Internet	80%	74%	76%	78%
Submit electronic third-party claims	60%	82%	67%	78%
Practice has World Wide Web site	25%	48%	29%	44%

*Three respondents belonged to other age groups or did not answer this item

care providers to discuss individual patient concerns. Only one respondent used data encryption for e-mail communications.

Thirty-eight percent of the respondents reported that their practices had a World Wide Web site. Ninety-four percent of those with a web site found that none or less than 25% of total new patients resulted from the Web site.

Solo and group practices had similar Internet connectivity (80% and 74%, respectively). However, a larger proportion of group practices submitted third-party claims electronically (82% vs 60%). Similarly, a greater proportion of group practices had a practice Web site as compared to solo practices (48% vs 25%; Table 1). However, these differences between solo and group practices were not statistically significant.

The 1970s practitioner cohort compared with the 1980s and 1990s combined practitioner cohort reported similar Internet connectivity (76% and 78%, respectively) for their practices. However, a larger proportion of the practices of the 1980s and 1990s cohort submitted third-party claims electronically (78% vs 67%). Similarly, a greater proportion of the practices of the 1980s and 1990s cohort had a practice Web site than the 1970s cohort (44% vs 29%; Table 1). However, these differences between the practices of the 1970s as compared with the 1980s and 1990s practitioner cohort were not statistically significant.

Discussion

The present study surveyed Internet usage by pediatric dental practices in Connecticut. Since the response rate “is taken as an indication of the quality of a survey,” the validity of the present survey is indicated by the response rate of 73%.⁸ A response rate of 70% to 79% is reportedly “acceptable.”⁸

The technological adaptation of Connecticut pediatric dental practices was good, as more than three-fourths of them were connected to the Internet. This continues a historical tradition among Connecticut health care providers who have been early adopters of new technology since “the first telephone exchange connected several Connecticut physicians to a central drugstore.”³

Almost three-fourths of the surveyed Connecticut pediatric dental practices submitted third-party claims

electronically. This proportion was more than twice the number reported by the American Dental Association's 2000 Survey of Current Issues in Dentistry (ADA's 2000 SCID) which noted that one-third (34%) of all dental practices submitted electronic dental claims.¹ This indicates that Connecticut pediatric dental practices were considerably ahead of their national dental peers in this regard. Among those Connecticut pediatric dental practices that submitted their third-party claims electronically, more than three-fourths reported that 76% to 100% of their total third-party claims were thus processed. This reflects the ADA's 2000 SCID data where among those who submitted electronic claims, majority of all claims were submitted electronically.¹

Now it remains to be determined as to whether what is being observed is simply "the electronic mailing of claims data" or true "electronic claims processing and electronic funds transfer" with simplification of the claims processing followed by early payments and minimal claim turnaround time.²

Almost all of the respondents in the present survey did not use e-mail to communicate with patients (parents). This seems cautious given that universal standards have not yet been adopted for dentist-patient e-mail communications. Issues relating to the confidentiality and privacy of privileged patient-dentist communications via e-mail remain a concern. Practitioners should use e-mail only "after a patient has been informed of potential risks and benefits and signed a formal "e-mail consent form."⁹ Practitioners should maintain separate e-mail accounts for exclusive professional use.⁴ Ideally all e-mail communications with patients should be handled through one address used only for that purpose. This should be distinct from the e-mail address used for communication with third-party payers and professional colleagues. Institution of e-mail communication with patients in a practice involves taking into consideration myriad details: the e-mail must be logged in for documentation and response; the e-mail must be answered within a reasonable predetermined time period; the e-mail correspondence should not utilize excessive time resources.¹⁰

The mail server must be configured for an automatic reply to acknowledge the receipt of messages.⁴ Also, the practice must deal with the common expectation among e-mail senders "that the recipient owes them an answer almost immediately."¹⁰ It is prudent to designate specific office personnel to handle the e-mail and thereby filter the administrative from the clinical queries. Patients should be informed beforehand of this filtering mechanism. Direct access to the dentist should be avoided to prevent the patients from doing an "end-run" around the administrative staff and directly approaching the dentist with queries relating to appointments, third-party payments, etc.

Not one respondent in the present survey used e-mail to discuss individual patient issues with other health care providers. This reflects the prudence exercised by pediatric dentists in Connecticut given the legal implications of such electronic communications. It has been noted that "even simply sending an e-mail message to a colleague could be

considered a teledentistry referral and may come under legal scrutiny."¹¹ Teledentistry refers to the combined use of telecommunications and computer technologies to provide dental care services.¹² Further, "many states have decided that such (electronic) referrals constitute the practice of medicine or dentistry in those states."¹¹ Connecticut is one of those 20 states with "restrictive licensure laws that require the health care practitioner to obtain a full license (with some exceptions) to participate in teledentistry across state lines."¹¹

Only one respondent in the present survey utilized data encryption for e-mail communications. "Use of the Internet is a two-way exchange of data over a public information network. Before data are exchanged, each message is divided into equal-sized units to which leading address labels and trailing termination markers are attached to form information packets."¹³ Transmission control protocol/Internet protocol (TCP/IP) is then used to move these data packets across the Internet to their destination computer identified by the IP address.¹³ The information packets can be maliciously intercepted by hackers as they travel over the Internet (packet sniffing).¹³ The use of data encryption for electronic communication addresses this security issue.¹³

It has been noted that "encrypted e-mail is comparable to the delivery of a registered letter, while unencrypted e-mail is more similar to a postcard."⁹ Therefore, it has been observed that "physicians should use encryption when communicating with or about a patient by e-mail, unless the patient has explicitly waived that option."³ A WWW-based user interface for secure electronic mail has been described using the Secure Socket Layer protocol-based Hypertext Transfer Protocol (SSL-HTTP).¹⁴

It has been noted that "the merit of this method is that many healthcare users can use a secure electronic mail system easily and immediately, because SSL-compatible WWW browsers are widely used and this system can be made available simply by installing a WWW-based mail user agent on a mail server."¹⁴ However, encryption of e-mail, though available, is yet to go mainstream. As evidenced in the present survey, pediatric dentists in Connecticut have simply avoided patient-related e-mail for the most part, thereby making this security issue moot.

Use of e-mail in a pediatric dental practice must be preceded by a written protocol for documentation and storage of e-mail that will withstand legal scrutiny. Akin to other relevant documents, e-mail communications will become part of patient medical records and are subject to discovery in a potential legal proceeding.⁹ Further, the 1977 U.S. Supreme Court decision in *Whalen v. Roe* implies that the computer used to store e-mail should be kept off-line so that no other computer terminal can read or record that information.⁹ Therefore, patient-related e-mail will have to be stored under protection using firewall technology in a networked system or a stand-alone system must be used for archiving the e-mail.

The above discussion highlights some of the issues that underscore the fact that adoption of e-mail communications in the health care setting, far from being a simple step, is a

complicated and multi-dimensional decision. The near-total avoidance of e-mail by the respondents in the present survey reflects upon this tenuous nature of contemporary electronic communication for confidential information. Therefore, it has been rightly observed that providers need to develop standards for e-mail communications.⁵ With explicit standards of technical security and legal indemnity, professional electronic communications may one day realize their oft-vaunted potential.

Only two-fifths of the Connecticut pediatric dental practices in the present study had an World Wide Web site. This was antithetical to their large-scale adoption of electronic claims submission. The case amply exists for each practice to have a Web site. It has been reported that 41 million people in the United States use the Internet for health information.⁵ This is ominous, given that "medical misinformation on the Internet is plentiful."¹⁵ The questionable quality of some of the health-related material on the Web has prompted the remark "Caveant Lector et Viewor - Let the Reader and Viewer Beware."¹⁶ However, it is encouraging to note that some laypersons are aware of this deficiency and therefore seek out credible health information sources on the Web.

The National Library of Medicine (NLM) has reported that at least 30% of MEDLINE users were the general public.¹⁵ This trend has impelled the NLM to broaden its service and introduce MEDLINEplus, which provides health information directed at the general public.¹⁵ The wisdom of this move and the success of this new service has been demonstrated by the steep increase in the number of "page hits" from 650,000 to 2.3 million per month during the year 2000.¹⁵ Therefore, it is imperative that health care providers "design their own Web sites that include links to other sites that they feel provide quality information to patients."¹⁵

Patients have reported "information from my own doctor's office" as the most desirable type of online health information.¹⁷ Further, it has been noted that "more than half of U.S. Internet users would be willing to visit a Web site designed by their physician."¹⁵ It has been sagaciously remarked that dentists should "develop a Web site for the practice. A "dot-com" presence is probably not essential for survival in 2001, but being in business without one much beyond 2005 is hard to imagine."¹²

The present study found that among those practices that had a Web site, most reported that none or less than 25 percent of total new patients resulted from the Web site. Therefore, pediatric dental practices contemplating establishing Web sites should be realistic in their expectations. However, this does not detract from the need for a Web site. The creation of a Web site for a pediatric dental practice will be rewarding in the long run with its limitless potential as, over the years, this electronic medium of communication will displace other media. For the present, it can serve as an Internet portal for health care information for the patients while creating an awareness for the practice's Web site, and

thereby building what marketing mavens term "brand equity."

Depending on the patient base, practice newsletters can be mailed electronically providing not only savings in postal charges, and thereby recouping the cost of the Web site, but also the potential for more interactive and "loaded" newsletters with audiovisual accouterments. As the technology improves and data security goes mainstream and becomes economical and convenient, other functions such as appointments and other aspects of practice administration can be moved to the Web site at a later date. Practitioners with a Web site may find that it enhances "their relationships with patients, creating a virtual link for a number of well-defined uses."¹⁸

At present, the large-scale adoption of electronic third-party claims submission was the only notable impact that the Internet has had on pediatric dental practices in Connecticut. This bears out the remark that, despite the potential of the Internet for far-reaching changes, "its impact on health care will continue to be tempered by privacy concerns and professional resistance."¹⁹

Conclusions

1. Most of the pediatric dental practices in Connecticut were connected to the Internet.
2. Electronic third-party claims submission was the predominant Internet service used by these practices.

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ABSTRACT OF THE SCIENTIFIC LITERATURE



ASTHMA

Asthma is a chronic inflammatory disease characterized by reversible airway obstruction. Inflammation has been scientifically proven to play a central role in the etiology of asthma. It is estimated that asthma affects 5-6% of children with a 2:1 male/female ratio. There are approximately 5,400 asthma deaths per year in the U.S. There are a number of classification systems for asthma. One classification divides asthma into two basic groups: allergic (extrinsic) and idiosyncratic (intrinsic). The allergic asthma is associated with atopy, eczema and seasonal allergies. There is an association with increased serum IgE levels and a positive response to allergen skin testing. The idiosyncratic asthma is not associated with allergy or increased IgE levels. This type of asthma usually has specific triggers that induce asthma attacks (e.g., aspirin, sulfites, dental materials, chemical irritants, emotional stress). Another classification system for asthma is based on the severity and treatment protocols (STEP). Using this classification, asthma is broken down into four categories: STEP 1 (mild intermittent), STEP 2 (mild persistent), STEP 3 (moderate persistent) and STEP 4 (severe persistent). The clinical presentation and management of asthma is well reviewed by the author. Moreover, the author reviews the dental considerations related to asthma. These considerations include oral manifestations from asthma medications that cause xerostomia, increased caries, oral pharyngeal candidiasis and soreness of the oral mucosa. Nonsteroidal anti-inflammatory medication (e.g., aspirin), opiates, macrolide antibiotics (e.g., erythromycin) and sulfite preservatives found in some local anesthetics should be avoided in the asthmatic patient. The dentist should review the need for steroid supplementation for patients with severe asthma on long-term systemic corticosteroids. In order to manage an acute asthmatic attack, it is prudent for the patient to bring their short-acting B^2 -agonist inhaler medication to the dental appointment. In case of an attack requiring more intense treatment, the dentist should be ready to use subcutaneous epinephrine administration.

Comments: This medical management update will help the prudent dentist provide excellent care to the asthmatic patient by understanding the etiology, the clinical presentation, the management and the dental considerations of asthma. **MAB**

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