

Orofacial Pain: Patient Satisfaction and Delay of Urgent Care

JOSEPH L. RILEY III, PhD^a

GREGG H. GILBERT, DDS, MBA^b

MARC W. HEFT, DMD, PhD^c

SYNOPSIS

Objective. Accomplishing the *Healthy People 2010* goal of eliminating disparities in oral disease will require a better understanding of the patterns of health care associated with orofacial pain. This study examined factors associated with pain-related acute oral health care.

Methods. The authors used data on 698 participants in the Florida Dental Care Study, a study of oral health among dentate adults aged 45 years and older at baseline.

Results. Fifteen percent of the respondents reported having had at least one dental visit as the result of orofacial pain. The majority of the respondents reportedly delayed contacting a dentist for at least one day; however, there was no difference between respondents reporting pain as the initiating symptom and those with other problems. Once respondents decided that dental services were needed, those with a painful symptom were nearly twice as likely as those without pain to want to be seen immediately. Rural adults were more likely than urban adults to report having received urgent dental care for a painful symptom. When orofacial pain occurred, those who identified as non-Hispanic African American were more likely than those who identified as non-Hispanic white to delay care rather than to seek treatment immediately, and women were more likely than men. Having a pain-related oral problem was associated with significantly less satisfaction with the services provided; non-Hispanic African American respondents were less likely than non-Hispanic white respondents to report being very satisfied, and rural residents were less likely than urban residents. Furthermore, men were more likely than women to suffer with orofacial pain without receiving either scheduled dental care or an urgent visit.

Conclusions. Barriers to care are complex and likely to be interactive, but must be understood before the goals of *Healthy People 2010* can be accomplished.

^aDivision of Public Health Services and Research, College of Dentistry, University of Florida, Gainesville, FL

^bDepartment of Diagnostic Sciences, School of Dentistry, University of Alabama at Birmingham, Birmingham, AL

^cClaude Pepper Center for Research on Oral Health in Aging, College of Dentistry, University of Florida, Gainesville, FL

Address correspondence to: Joseph L. Riley III, PhD, P.O. Box 100404, Health Science Ctr., Univ. of Florida, Gainesville, FL 32610-0404; tel. 352-392-2671; fax 352-392-2672; e-mail <jriley@dental.ufl.edu>.

©2005 Association of Schools of Public Health

One of the primary goals of *Healthy People 2010* is to eliminate health disparities among different segments of the population.¹ Among other conditions, the report specifically targets oral disease, stating that it is most common among those least able to access health care and leads to needless pain and suffering. Accomplishing the goal of eliminating disparities in oral disease will require a better understanding of the patterns of health care associated with orofacial pain. Using data from the National Health Interview Survey for individuals who reported having experienced tooth pain in the past six months, Vargas et al. found that people identified as African American were 1.4 times as likely to suffer pain without the benefit of a dental visit, compared with people identified as non-Hispanic white.² It is not known whether the dental visits were initiated by tooth pain.

Only a few studies have explicitly quantified the incidence or prevalence of pain-related dental care³ or general medical emergency care.⁴ The most common setting for the study of acute pain-related health care is the medical emergency room. However, many people with acute pain may make unscheduled visits to their regular health care providers. Several studies have documented the percentage of dental visits associated with acute orofacial pain, with findings ranging from 33% to 88%.⁵⁻⁹ These studies involved individuals seeking care at dental school emergency clinics or used data from surveys of practicing dentists, and were not based on random community-based samples. Consequently, they provide only limited insight into health care behavior when immediate, previously unscheduled care is needed for orofacial pain.

These studies did not report differences by sociodemographic characteristics, such as gender, age cohort, race/ethnicity, or residential setting—variables relevant to the aims stated in *Healthy People 2010*. Furthermore, little information is known about the time delay in seeking and receiving care for acute orofacial pain, or about patient satisfaction with the quality of the care received. This information is also relevant to the aims stated in *Healthy People 2010* because the perceived quality of the patient/provider interaction may affect subsequent behavior by those who have received inadequate oral health care. There is some evidence from studies of medical emergency clinics that delay in receiving care and the amount and quality of the information received are associated with patient satisfaction.^{10,11} Two studies of emergency medical service care found that members of minority racial/ethnic groups (relative to the majority white population) and those with the lowest levels of education (relative to those with higher levels of education) expected to have to wait a shorter time for care, received more extensive care, but were less satisfied with the care received.^{11,12} It is interesting that only a few studies have found strong correlations between pain relief and patient satisfaction following medical emergency visits.¹³⁻¹⁶

The purpose of the present study was to describe patterns of urgent oral health care associated with pain, using data from the Florida Dental Care Study (FDCS).¹⁷ We define urgent dental care as health care associated with an acute dental need for which the person does not have a previously scheduled appointment. Specifically, we quantified the percentage of urgent dental visits that involved painful symptoms and explored several variables related to time delay and

patient satisfaction with the services provided. We also tested for differences in having made an urgent dental visit for oral pain across sociodemographic characteristics, orientations to dental care, and history of use of specific dental services.

METHODS

Sampling methods

Data were from the FDCS, a prospective longitudinal study of oral health and dental care (more information on the Florida Dental Care Study is available from: URL; <http://nersp.nerdc.ufl.edu/~gilbert>). We used telephone screening to identify individuals who met eligibility criteria, from which we selected a stratified random sample to participate at baseline. The sampling methodology and selection are provided in an earlier publication.¹⁷

The informed consent of all human subjects who participated in this investigation was obtained after the nature of the procedures had been explained fully.

The 873 subjects who participated at baseline were a representative sample of a population defined as those who (1) resided in one of the four counties of interest; (2) were English-speaking; (3) were capable of engaging in a cogent telephone conversation; (4) resided in a household, in contrast to a congregate facility; (5) reported their race/ethnicity as non-Hispanic African American or non-Hispanic white (respondents were first asked a question about their race, then asked, "Are you of Spanish or Hispanic ancestry?"); (6) had at least one remaining natural tooth; and (7) were 45 years of age or older. Four counties in north Florida were selected because they provided an urban/rural contrast and have large percentages of African Americans, older adults, and people living in poverty, and because of their geographic proximity to the administrative base for the project.¹⁸ Three of the counties were predominantly rural, and one was urban.

By 54 months, 703 participants (unweighted *n*) remained in the study. Of the 170 individuals who were not available for the 54-month telephone interview, 65 were deceased, 44 refused, 18 were medically unable to participate, and 43 were unreachable. Those who participated at 54 months were more likely ($p < 0.05$): to have been regular dental care attenders, to have household incomes greater than 100% of the federal poverty threshold, to score higher on a scale of self-rated general health, to self-identify as non-Hispanic white, to belong to the younger age cohort (45-64 years), and to have been free of active dental caries at baseline. No differences in participation were observed with respect to gender, area of residence, or dental insurance status. The possible effect of this attrition on pain prevalence is suggested by differences in baseline prevalence of toothache pain. At baseline ($n = 873$), 12.1% of participants reported current toothache pain. If the baseline had included only those individuals who ultimately participated at 54 months ($n = 703$), then that figure would have been 12.4%. This difference was not statistically significant.

For ethical reasons, examiners informed participants of findings from the clinical examination and answered questions concerning these findings or questions concerning where dental care might be sought. However, examiners and research staff did not make dental appointments for subjects. Also, participants understood through the informed

consent process that no dental care would be provided as part of the study. An earlier report from the FDCCS documented the bias introduced in the study because of the methodology used. It was found that there was some stimulation in dental care use for the sample overall, but use had returned to baseline levels by the 18–24 month period.¹⁷

Interview methods

Trained interviewers administered a baseline interview, which lasted approximately 30 minutes. Interviewers collected a wide range of information, including demographic data. Test-retest coefficients for specific questions ranged from 1.00 to 0.77 in a subset of 42 subjects, over an average interval of four days. A clinical examination was performed immediately after the baseline interview. The baseline interview and clinical examination were followed by telephone interviews at six-month intervals following the baseline. At 24 and 48 months after baseline, the interview was performed in person instead of by telephone, and was followed immediately by a clinical examination that was identical to the baseline examination.

Measures

The following questions were asked of the respondents:

Urgent dental care

- “Since you started in this study, which has been about 4½ years, have you had to seek emergency or immediate dental treatment for which you did not already have an appointment? Examples of a dental emergency might include such things as a toothache, dental injury, an abscess, or anything else that needed attention very soon.” The response was coded as yes or no.
- “How many times did you have dental emergencies since you started in this study?” Response choices were: once, twice, three times, four or more times.
- “What type of problem was your most recent dental emergency? Toothache? Dental abscess? Gum infection? Broken tooth? Broken filling? Other?” If “other” was selected, the respondent was asked to specify the problem. Each problem was coded as yes or no. For each problem endorsed, the following question was immediately asked: “How painful was this?” Response choices were: severe, moderate, mild, not painful.
- “Talking only about your most recent dental emergency, how long did you have this problem before calling to make an appointment with a dentist?” Response choices were: same day, next day, within three days, other, did not call. If “other” was selected, the respondent was asked to specify.
- “How soon did you want the dentist to see you?” Response choices were: same day, next day, within three days, other. If “other” was selected, the respondent was asked to specify.
- “How soon did the dentist actually see you?” Response choices were: same day, next day, within three days, other. If “other” was selected, the respondent was asked to specify.
- “Once you got to the dental office, how long did you have to wait?” Responses were scored in minutes.

- “How satisfied were you with the way the dentist explained what you needed done?” Response choices were: very satisfied, satisfied, dissatisfied, very dissatisfied.
- “How satisfied were you with the way the dentist took care of your problem?” Response choices were: very satisfied, satisfied, dissatisfied, very dissatisfied.

Access variables

- Present financial status. Response choices were: I really can’t make ends meet; I manage to get by; I have enough to manage plus some extra; money is not much of a problem; I can buy about whatever I want.
- Ability to pay an unexpected \$500 dental bill. Response choices were: able to pay comfortably; able to pay but with difficulty; not able to pay the bill.
- “Some people have dental insurance that pays for part of their dental bills, such as from an employer, Medicaid, or the VA. Are you covered by any such dental insurance program?”
- “What was the highest level of formal schooling you have completed?” Respondents were categorized as having completed high school or not having completed high school.

Oral health behaviors

- History of dental care was assessed using the following questions that were asked at each interview following baseline: “Have you been to see a dentist since we talked with you last on (date of last interview)?” “How many times did you go to this dentist since we talked with you last?” The respondents were asked the reason for each visit and asked about the services provided.
- Approach to dental care: “Which of the following statements best describes your approach to dental care: (a) I never go to a dentist; (b) I go to a dentist when I have a problem or when I know that I need to get something fixed; (c) I go to a dentist occasionally whether or not I have a problem; or (d) I go to a dentist regularly.” Respondents were coded as problem-oriented attenders (responses a or b) or regular attenders (responses c or d).

Statistical methods

All results are weighted estimates that reflect the population of interest, rounded to the nearest whole number. Weights were developed using special tabulations provided by the U.S. Census Bureau that detailed the distribution of target populations provided by age, gender, race/ethnicity, and poverty status.¹⁸ A series of binary logistic regression models was used to test for predictors of the behaviors of interest, which were: (1) reporting an urgent dental visit with severe, moderate, or mild orofacial pain vs. an urgent dental visit without pain; (2) reporting an urgent dental visit with severe, moderate, or mild orofacial pain vs. no urgent dental visit; (3) a delay of longer than two days for a pain-related urgent dental visit; (4) being “very satisfied” with the treatment provided at the pain-related urgent dental visit; (5) being “very satisfied” with the explanation for the problem in a pain-related dental visit. Financial status, ability to

pay, dental insurance status, and educational achievement were entered in all regressions to adjust for differences in socioeconomic status. For the dichotomous variables, the following were coded 0 and used as reference categories: non-Hispanic white race/ethnicity, female sex, ≥65 age group, urban residential setting, having a regular attender dental care orientation, and not having received a specific dental treatment. Mann-Whitney U, chi-square, or Spearman *r* were used to test for bivariate significance as appropriate.

RESULTS

At the 54-month interview, 703 participants remained in the FDCS; however, five did not respond to questions about urgent dental visits and were not included in the following analyses. Table 1 shows selected characteristics of the remaining 698 respondents.

Of the 698 respondents, 162 (23%) reported at least one urgent dental visit, with 37 of these respondents (23%) reporting more than one urgent dental visit. Of those reporting urgent dental visits, 106 (65%) indicated that their most recent urgent visit involved a painful symptom. When pain was reported, it was rated as severe for 67% of visits (not shown). A visit for an abscessed tooth or tooth pain always involved pain, whereas visits for a loose cap or crown or a broken filling were not associated with pain (Table 2). An abscessed tooth was the reason most frequently associated with severe pain (80%), followed by gum infection (75%)

and tooth pain (66%). Eleven of the respondents reporting an urgent dental visit listed two reasons for the visit (eight endorsed two painful symptoms, and three endorsed two non-painful symptoms).

Urgent dental visits

Table 3 presents estimates of odds ratios (ORs) for reporting a pain-related urgent dental visit vs. reporting an urgent dental visit without pain; Table 4 presents estimates of ORs for reporting a pain-related dental visit vs. not reporting an urgent dental visit, for each of the patient characteristics and history of care variables.

Demographics and approach to care. Of respondents reporting an urgent dental visit, those living in rural residential settings were more likely to report an urgent dental visit with pain (OR=2.0) than a non-pain-related dental visit. Similarly, among respondents reporting an urgent dental visit, those holding a problem-oriented approach to dental care were more likely to report an urgent dental visit with pain (OR=2.0) than a non-pain-related dental visit. Respondents living in rural residential settings were also more likely to report an urgent dental visit associated with pain (OR=1.7) than to report not having had an urgent dental visit.

History of specific dental procedures. For respondents reporting an urgent dental visit, an extraction visit (OR=2.2) was more closely associated with a pain-related urgent dental visit than an urgent dental visit for a non-pain problem,

Table 1. Distribution of respondents by gender, age group, rural vs. urban residence, and self-reported race/ethnicity (N=698)

Variable	Male	Female	45–64 years ^a	≥65 years ^a	Rural residence	Urban residence
45–64 years	119	238	—	—	—	—
≥65 years	100	241	—	—	—	—
Rural residence	113	232	117	168	—	—
Urban residence	106	247	180	173	—	—
Non-Hispanic white	132	274	210	196	205	201
Non-Hispanic African American	87	205	147	145	140	152

^aAge at baseline

Table 2. Reasons given for urgent dental visits (n=162 visits) and number of visits by reason for visit and pain rating (n=106 respondents reporting pain-related urgent dental visits)

Reason given for urgent dental visit	Number of visits (percent of visits)	Number of visits (percent of visits) by reason for visit and pain rating			
		Severe	Moderate	Mild	No pain
Tooth pain	57 (33)	36 (63)	15 (26)	6 (11)	0 (0)
Broken tooth	38 (23)	7 (18)	4 (11)	2 (5)	25 (66)
Abscessed tooth	30 (18)	24 (80)	5 (17)	1 (3)	0 (0)
Loose cap/crown	16 (10)	0 (0)	0 (0)	0 (0)	16 (100)
Broken filling	14 (9)	0 (0)	0 (0)	0 (0)	14 (100)
Gum infection	8 (5)	6 (75)	1 (13)	1 (13)	0 (0)
Other	10 (7)	4 (40)	1 (10)	0 (0)	5 (50)

NOTES: Eleven respondents endorsed two reasons for the visit, so the number of problems sums to 173. Some rows do not sum to 100% because of rounding errors.

Table 3. Predictors of reporting a pain-related urgent dental visit compared to a non-pain-related urgent dental visit

Covariate	Adjusted OR ^a for a pain-related urgent visit compared to a non-pain-related urgent visit (n=162)
Sociodemographic and history of care model ^b	
Race/ethnicity (non-Hispanic white, non-Hispanic African American)	1.2 (0.7, 2.0)
Gender (female, male)	0.9 (0.6, 1.4)
Age at baseline (≥65, 45–64)	0.8 (0.4, 1.5)
Residence (urban, rural)	2.0 (1.4, 3.1) ^d
Approach to care (regular, problem-oriented)	2.0 (1.4, 3.1) ^d
Model for specific procedures ^c	
Surgery	1.3 (0.8, 2.0)
Extraction	2.2 (1.4, 4.0) ^d
Check-up/cleaning	0.6 (0.2, 0.9) ^e
Restorative	0.5 (0.2, 0.8) ^d
Root canal	0.8 (0.4, 1.5)
Denture/cap visit	1.2 (0.7, 1.9)

^aAdjusted for financial status, ability to pay, dental insurance, and educational achievement.

^bFor the sociodemographic and history of care model, the comparison groups are listed first and were coded 0. Model fit: χ^2 (9)=44.608; $p<0.001$.

^cFor the specific procedures model, not having received the dental procedure was coded 0. Model fit: χ^2 (10)=24.175; $p=0.007$.

^d $p<0.01$

^e $p<0.05$

OR = odds ratio

whereas a restorative visit (OR=0.5) and a check-up/cleaning visit (OR=0.6) were more closely associated with a non-pain visit than a pain-related visit. Reporting an extraction visit (OR=2.5) or a root canal visit (OR=3.0) were more closely associated with reporting a pain-related urgent dental visit than with not reporting an urgent dental visit.

Delay of care associated with urgent dental visit

Respondents reporting a pain-related urgent dental visit wanted to see a dentist sooner ($p<0.001$) and did see a dentist sooner ($p=0.01$) than those with a problem unrelated to pain (Table 5). There was no difference in the time delay before a dentist was contacted following the onset of pain-related or non-pain-related dental problems.

Table 4. Predictors of reporting a pain-related dental visit compared to reporting no urgent dental visits

Covariate	Adjusted OR ^a for a pain-related urgent visit compared to no urgent visit (n=642)
Sociodemographic and history of care model ^b	
Race/ethnicity (non-Hispanic white, non-Hispanic African American)	1.3 (0.8, 2.0)
Gender (female, male)	1.2 (0.7, 1.9)
Age at baseline (≥65, 45–64)	1.3 (0.8, 2.1)
Residence (urban, rural)	1.7 (1.2, 2.3) ^d
Approach to care (regular, problem-oriented)	0.9 (0.7, 1.4)
Model for specific procedures ^c	
Surgery	1.4 (0.8, 2.0)
Extraction	2.5 (1.7, 4.0) ^d
Check-up/cleaning	0.8 (0.5, 1.4)
Restorative	0.8 (0.5, 1.4)
Root canal	3.0 (2.1, 4.1) ^d
Denture/cap visit	1.1 (0.7, 1.5)

^aAdjusted for financial status, ability to pay, dental insurance, and educational achievement.

^bFor the sociodemographic and history of care model, the comparison groups are listed first and were coded 0. Model fit: χ^2 (9)=20.552; $p=0.015$.

^cFor the specific procedures model, not having received the dental procedure was coded 0. Model fit: χ^2 (10)=29.191; $p=0.001$.

^d $p<0.01$

OR = odds ratio

Patient characteristics as predictors of delay in seeking treatment for oral pain for longer than two days are displayed in Table 6. Respondents who identified as non-Hispanic African American were more likely than those who identified as non-Hispanic white to have delayed three or more days before calling a dentist (OR=2.2). Males were less likely than females to have delayed three or more days before talking to a dentist (OR=0.2).

Fifty-two percent of the respondents reporting a pain-related urgent dental visit said they were seen in less than 15 minutes once they arrived at the dental office. An additional 23% waited from 15 to 29 minutes, 15% waited 30 to 44 minutes, and the remaining 10% reported a wait of 45 minutes or longer. Non-Hispanic African American respondents waited longer to be seen than non-Hispanic white respondents ($\chi^2(3)=29.580; p<0.001$), and those in the older age category waited longer to be seen than those in the younger category ($\chi^2(3)=8.983; p<0.05$). We found a positive association between pain and how quickly urgent dental visitors desired to be seen once they had contacted a dentist ($r=0.39; p<0.01$) and how long they waited in the office ($r=0.28; p<0.05$), but not between pain and the time delay in contacting a dentist. As expected, the three delay variables were significantly correlated (delay in contact and how soon wanted to be seen: $r=0.35; p<0.01$; delay and how soon seen: $r=0.30; p<0.01$; how soon wanted to be seen and how soon seen: $r=0.40; p<0.01$).

Satisfaction with urgent dental visit for pain

Respondents reporting a pain-related urgent dental visit were significantly less satisfied with the explanation received about a problem ($U=2303.50; p=0.048$) and less satisfied with the treatment received ($U=2273.00; p=0.018$) than those with a dental problem unrelated to pain (Table 7). We also found that the time spent waiting to be seen was negatively associated with satisfaction with the explanation of the problem ($r=-0.38; p<0.01$) and satisfaction with the outcome of the treatment ($r=-0.28; p<0.01$). The pain rating was not associated with either of the satisfaction variables.

Patient characteristics as predictors of satisfaction are displayed in Table 8. Because waiting time in the dental office was associated with satisfaction, differences in waiting time were adjusted for in the logistic regression models. Respondents who self-identified as non-Hispanic African American were less likely to report being very satisfied with the treatment received (OR=0.3) than those who self-

Table 6. Predictors of delay of ≥3 days in contacting a dentist for a pain-related urgent dental problem (n=106 visits)

Variable	Number of respondents (percent of respondents) reporting delay	Adjusted OR (95% CI)
Race/ethnicity		2.2 (1.2, 4.7) ^a
Non-Hispanic white	12 (40)	
Non-Hispanic African American	16 (59) ^a	
Gender		0.2 (0.1, 0.5) ^b
Female	20 (58)	
Male	6 (26) ^b	
Age at baseline		0.9 (0.4, 2.1)
≥65 years	16 (50)	
45–64 years	11 (44)	
Residence		0.7 (0.3, 1.4)
Urban	10 (42)	
Rural	18 (53)	

NOTE: Model fit: $\chi^2(8)=20.056; p=0.009; n=106$.

^a $p<0.05$

^b $p<0.01$

OR = odds ratio

CI = confidence interval

identified as non-Hispanic white, and those living in rural residential settings were less likely to report being very satisfied with the treatment received (OR=0.4) than those living in urban settings. Non-Hispanic African American respondents were less likely to report being very satisfied with the explanation provided by the dentist for the problem (OR=0.4) than non-Hispanic white respondents.

Pain-related symptoms of respondents with no dental visits

Exploratory analysis identified the existence of a subgroup of 138 participants who reported having had no contact with a dentist in the 54 months since baseline. We measured differences in reporting orofacial pain and pain impact (tooth pain, painful gums, daily activity reduction from orofacial pain, and difficulty sleeping because of orofacial pain) at

Table 5. Time delay in urgent dental visits (n=162 visits)

Time interval	Number of visits (percent of visits)					
	How long delayed in contacting		How soon wanted to be seen		How soon actually seen	
	With pain (n=106)	No pain (n=56)	With pain (n=106)	No pain (n=56)	With pain (n=106)	No pain (n=56)
Same day	23 (22)	17 (30)	82 (77)	23 (41)	47 (44)	11 (20)
Next day	33 (31)	19 (34)	15 (14)	13 (23)	23 (22)	19 (34)
3–6 days	27 (25)	6 (11)	9 (8)	9 (16)	24 (23)	17 (30)
≥7 days	23 (22)	14 (25)	0 (0)	11 (20)	11 (10)	9 (16)
Total	106 (100)	56 (100)	106 (100)	56 (100)	106 (100)	56 (100)

Table 7. Satisfaction with urgent dental visits among respondents reporting urgent dental visits (n=162 visits)

Variable	Number of respondents (percent of respondents)			
	Explanation of problem		Outcome of treatment	
	With pain (n=106)	Without pain (n=56)	With pain (n=106)	Without pain (n=56)
Very satisfied	49 (46)	38 (68)	59 (56)	44 (79)
Satisfied	45 (42)	17 (31)	28 (26)	11 (20)
Dissatisfied	7 (7)	1 (2)	17 (16)	1 (2)
Very dissatisfied	5 (5)	0 (0)	2 (2)	0 (0)

two or more of the six-month interviews among the following three groups: (1) those reporting one or more dental visits but no urgent dental visit; (2) those with one or more urgent dental visits; and (3) those with no dental contacts (Table 9).

We also examined the sociodemographic profile of those without dental visits who reported orofacial pain. To accomplish this, we collapsed the tooth pain and painful gums variables and identified respondents who reported either or both pain symptoms at two or more assessments. Forty-five percent of those without any dental visit met this criterion. A logistic regression analysis that included sociodemographic and socioeconomic variables indicated that males were five times as likely as females (OR=0.2) to suffer oral pain without a dental visit.

DISCUSSION

This study documented rates of unscheduled, urgent visits for oral problems for a community-based sample of adults across a 54-month time period. Twenty-three percent of the respondents reported having had at least one urgent dental visit since baseline, with 15% reporting that their most recent urgent dental visit was pain-related. The majority of the respondents with urgent visits reported having delayed contacting a dentist for at least one day; however, there was no difference in time delay between respondents reporting pain as the initiating symptom and those with other problems. Once respondents decided that dental services were needed, those with a painful symptom were nearly twice as likely as those without painful oral symptoms to want to be seen immediately. Those with pain also tended to be less satisfied with the outcomes of the visit than those without oral pain.

Prevalence of visits

Of the 162 urgent dental visits reported, 65% were related to painful symptoms. We found that rural residents are at greater risk than urban residents for reporting an urgent dental visit associated with a painful oral symptom. That rural adults report a higher rate of incident urgent dental care is consistent with findings that they have greater dental needs than urban adults.^{19,20} However, in a previous study, we found that rural adults were less likely than urban residents to speak to a health care professional about their orofacial pain.²¹ That finding and the results of the present study are consistent with the hypothesis that those with less access to health care attempt to manage oral pain without the benefit

of a dental visit until the symptom becomes severe, possibly taking over-the-counter or prescription pain medication already available in the household.²² Studies of complementary and alternative approaches to pain management suggest

Table 8. Predictors of satisfaction with urgent dental visits among respondents reporting urgent dental visits (n=162 visits)

Variable	Number of respondents very satisfied (percent)	OR (95% CI)
Outcome of treatment ^a		
Race/ethnicity		0.3 (0.2, 0.7) ^d
Non-Hispanic white	77 (75)	
Non-Hispanic African American	28 (51) ^b	
Gender		0.6 (0.3, 1.4)
Female	72 (68)	
Male	33 (62)	
Age at baseline		1.7 (0.9, 3.1)
≥65	41 (60)	
45–64	64 (71)	
Residence		0.4 (0.2, 0.8) ^b
Urban	61 (73)	
Rural	44 (58)	
Explanation of problem ^c		
Race/ethnicity		0.4 (0.2, 0.8) ^d
Non-Hispanic white	66 (64)	
Non-Hispanic African American	23 (42)	
Gender		0.6 (0.3, 1.3)
Female	63 (60)	
Male	27 (51)	
Age at baseline		1.9 (0.9, 3.5)
≥65	34 (50)	
45–64	56 (62)	
Residence		0.8 (0.4, 1.7)
Urban	49 (58)	
Rural	51 (55)	

^aModel fit: $\chi^2 (8)=18.738$; $p=0.016$; $n=106$.

^b $p<0.05$

^cModel fit: $\chi^2 (8)=17.877$; $p=0.020$; $n=106$.

^d $p<0.01$

OR = odds ratio

CI = confidence interval

Table 9. Reported symptoms by type of dental visit (n=698 respondents)

Symptom	Number of respondents (percent of respondents)		
	≥1 non-urgent dental visits (n=398)	≥1 urgent dental visits (n=162)	No dental visits (n=138)
Tooth pain	99 (25)	65 (40)	37 (27)
Painful gums	99 (25)	57 (35)	51 (37)
Activity reduction	16 (4)	15 (9)	15 (11)
Sleep difficulty	32 (8)	21 (13)	19 (14)

that a variety of pain self-management strategies may be used to avoid use of health care services.^{23,24} Shortages of rural health care practitioners may also be a factor in delaying care.²⁵ A rural-urban contrast is seldom made with regard to pain. There is limited evidence that rural residential settings are associated with a higher prevalence of arthritis and associated pain than urban settings.²⁶

Pain characteristics and delay in urgent dental visits

Few studies have examined sensory and temporal characteristics of pain as a cue for seeking health care. In our previous work, we reported that the intensity and duration of orofacial pain are factors in the decision about seeking care.^{27,28} However, these studies did not distinguish between scheduled and unscheduled visits. In the present study, we found that 25% of those reporting an urgent dental visit contacted a dentist the day of pain onset, 32% called the day following onset, whereas 22% waited longer than one week. Regarding the provision of care, 40% were seen the same day they called and 26% the next day. Pain severity was not a significant factor in the decision to delay contacting a dentist. Therefore, we conclude that although pain associated with urgent dental visits is often severe, a substantial portion of those with severe pain do not seek care immediately. We did find that pain was negatively associated with the length of time a patient waited to be seen in the office, suggesting that the dentists and dental staff were sensitive to patient needs.

To our knowledge, no published studies have examined sociodemographic predictors of delays in seeking or obtaining needed care associated with orofacial pain. We found that respondents who identified as non-Hispanic African American were at greater risk for delay in contacting a dental care provider for longer than 48 hours following pain onset than those who identified as non-Hispanic white, and women were at greater risk than men. The medical sociology literature generally supports the suggestion that females seek care sooner than males.²⁹ However, we found that males are more likely not to go at all; it would appear that females may delay but ultimately do seek care for orofacial pain.

Satisfaction with urgent dental visits

Patient satisfaction is an area of increased interest for health care administrators, third-party payers, and patient advocacy groups.³⁰ Patient satisfaction is subjective and is based on the

patient's expectations, perceptions, attitudes, beliefs, and prior experiences.^{31,32} In general, FDCS respondents who received urgent dental care were satisfied with their care. Having a pain-related oral problem was associated with significantly less patient satisfaction with the explanation for the problem as well as the outcome of the treatment provided, compared to those making non-pain related urgent dental visits. Although we were unable to find any studies that have reported satisfaction with urgent dental visits for orofacial pain, several studies of medical emergency visits have linked patient satisfaction with the quality of the communication between patient and caregiver. For example, Sun et al. found that dissatisfaction was related to an inadequate explanation of the causes of the problem, long waiting time, not being told about the potential wait time, and minimal explanation of test results.¹¹ Consistent with this finding, we found that when people with acute orofacial pain contacted a dentist, they wanted to be seen more quickly than did those with non-painful problems. In addition, there was a significant positive correlation between pain and desire for prompt treatment.

The lack of adequate treatment of pain in medical emergency departments has been documented.^{32,33} However, there are conflicting reports regarding associations between patient satisfaction and pain severity. For example, Stahmer et al. found a linear relationship between patient satisfaction and pain relief¹⁴; however, Kelly¹⁵ and Ward and Gordon¹³ found that pain ratings or pain reduction ratings did not correlate with patient satisfaction.

A variable related to satisfaction would be time delay before being seen, as patients would desire rapid delivery of pain medication. Although we did not assess the time until treatment began, 75% of respondents reported having been seen in less than 30 minutes. This is within the range of patient expectation reported by Fosnocht et al.¹⁶ and may have contributed to the overall satisfaction reported in the present study.

Dental care history and need for urgent dental care

It has been reported that people without regular dental care are more likely to report a visit to an emergency dental clinic than people with regular dental care^{8,34} because routine examinations identify problems before they become symptomatic. These studies did not specifically address visits for pain. We found that a problem-oriented approach to dental care increased the likelihood of having a pain-related urgent visit compared to a visit for other reasons, but was not a predictor of a pain-related visit compared to no urgent dental visits.

Because we have recorded the dental care history in the FDCS from baseline through 54 months, we have been able to equate the use of specific dental procedures with receiving unscheduled, urgent dental services. Consistent with the finding that one or more check-up/cleaning visits decrease the risk of an urgent dental visit with pain, we would expect that check-ups and cleanings (preventive strategies) would predict less oral pain and would decrease the probability of an urgent dental visit, and that individuals needing restoration, extraction, or root canal procedures would be at elevated risk for a pain-related urgent dental visit. Generally

the results were consistent with these hypotheses, although we found that having a restorative visit was associated with a reduced risk of needing urgent dental visits for pain.

We would suggest that poor overall oral health, which is associated with greater need for extraction or root canal services rather than having an extraction or root canal per se, is the risk factor for dental emergencies. Similarly, these findings do not necessarily imply a causal negative relationship between preventive care and subsequent urgent visits. Individuals who make preventive visits may also have better personal oral hygiene or better diets than those who do not receive preventive care.

Evidence suggests that many people in the U.S. suffer with significant painful oral symptoms yet fail to see a health care professional.² These individuals are missed in studies of emergency services. We have disaggregated this group and found they have an oral pain profile similar to those reporting pain-related urgent dental visits.

Study limitations

Several methodological issues should be considered when interpreting these results. Dental treatment and pain-related variables are based on self-report and are subject to an individual's interpretation. There is likely to be some inaccuracy in recall of urgent dental visits. However, several studies have shown that procedures with more impact on or salience for the daily lives of individuals are recalled more accurately than visits for scheduled or preventive treatments.^{35,36} The specific reasons for treatment choices are unknown and may reflect patient choice as well as the recommendations made by dentists. FDACS participants were 49 years of age or older at the 54-month interview, and whether the associations reported hold in younger adults is unknown.

Summary and conclusion

This study examined patterns of health care associated with orofacial pain. This information is important because the pain and suffering resulting from oral disease are most common among those least likely to have access to health care, and interventions need to target these groups. We found that rural adults are more likely than urban adults to have pain-related urgent dental visits, but when orofacial pain occurs, non-Hispanic African American adults are more likely than non-Hispanic white adults and women are more likely than men to delay care rather than to seek treatment immediately. However, we found that men are more likely than women to experience orofacial pain and not receive dental care. Having a pain-related oral problem was associated with significantly less satisfaction with the services provided relative to having a non-pain-related visit. Non-Hispanic African Americans are less likely than non-Hispanic whites to report being very satisfied, and rural residents are less likely than urban residents. For some individuals, lack of satisfaction with aspects of dental visits may be a significant barrier to health care; consequently, they may suffer without treatment or manage their painful symptoms at home. Others may delay seeking care until the pain is severe. Little is known about the cost-benefit calculus involved in these decisions and how they may differ between groups.

Although we have identified groups at risk for a range of orofacial pain-related behaviors, other more proximal vari-

ables, such as the emotional distress of acute orofacial pain, attitudes and beliefs about disease, and the value of care may also help explain these differences.^{37,38} Even within groups, there are differing experiences with the health care system that influence the way symptoms are interpreted and the way decisions are made about seeking care.^{39,40} Further studies are needed to better identify factors that lead to delay in seeking care. For example, it is not known how pain unpleasantness affects decisions about pain-related health care. How and whether delaying care for acute orofacial pain affects outcomes is also not known. Barriers to care are complex and likely to be interactive, but must be understood before the goals of *Healthy People 2010* can be accomplished.

This investigation was supported by National Institutes of Health (DE-11020 and DE-14164). Additional support was provided by the University of Florida. The opinions and assertions contained herein are those of the authors and are not to be construed as necessarily representing the views of the University of Florida, the University of Alabama at Birmingham, or the National Institutes of Health.

REFERENCES

1. Department of Health and Human Services (US). *Healthy People 2010*. Washington: Government Printing Office; 2000 Nov.
2. Vargas CM, Macek MD, Marcus SE. Sociodemographic correlates of tooth pain among adults: United States, 1989. *Pain* 2000;85:87-92.
3. Cohen LA, Manski RJ, Magder LS, Mullins CD. Dental visits to hospital emergency departments by adults receiving Medicaid: assessing their use. *J Am Dent Assoc* 2002;133:715-24.
4. Johnston CC, Gagnon AJ, Fullerton L, Common C, Ladores M, Forlini S. One-week survey of pain intensity on admission to and discharge from the emergency department: a pilot study. *J Emerg Med* 1998;16:377-82.
5. Segal H. Duration and type of pain of emergency patients. *Gen Dent* 1984;32:507-9.
6. Sonis ST, Valachovic RW. An analysis of dental services based in the emergency room. *Spec Care Dentist* 1988;8:106-8.
7. Bentley JE. A look at emergency, walk-in care. *J Am Dent Assoc* 1991;122:77-8.
8. Gibson GB, Blasberg B, Hill SJ. A prospective survey of hospital ambulatory dental emergencies. Part 1: Patient and emergency characteristics. *Spec Care Dentist* 1993;13:61-5.
9. Halling A, Ordell S. Emergency dental service is still needed—also for regular attenders within a comprehensive insurance system. *Swed Dent J* 2000;24:173-81.
10. Bursch B, Beezy J, Shaw R. Emergency department satisfaction: what matters most? *Ann Emerg Med* 1993;22:586-91.
11. Sun BC, Adams J, Orav EJ, Rucker DW, Brennan TA, Burstin HR. Determinants of patient satisfaction and willingness to return with emergency care. *Ann Emerg Med* 2000;35:426-34.
12. Brown R, Hernandez N, Gonsoulin M, Carey M. Variations in prudent laypersons' perceptions of the need for emergent medical care. *J Emerg Med* 2000;18:1-5.
13. Ward SE, Gordon D. Application of the American Pain Society quality assurance standards. *Pain* 1994;56:299-306.
14. Stahmer SA, Shofer FS, Marino A, Shepherd S, Abbuhl S. Do quantitative changes in pain intensity correlate with pain relief and satisfaction? *Acad Emerg Med* 1998;5:851-7.
15. Kelly AM. Patient satisfaction with pain management does not correlate with initial or discharge VAS pain score, verbal pain rating at discharge, or change in VAS score in the emergency department. *J Emerg Med* 2000;19:113-6.
16. Fosnocht DE, Swanson ER, Bossart P. Patient expectations for pain medication delivery. *Am J Emerg Med* 2001;19:399-402.
17. Gilbert GH, Duncan RP, Campbell AM. Evaluation for an observation effect in a prospective cohort study of oral health outcomes. *Community Dent Oral Epidemiol* 1998;26:233-40.
18. Gilbert GH, Duncan RP, Kulley AM, Coward RT, Heft MW.

- Evaluation of bias and logistics in a survey of adults at increased risk for oral health decrements. *J Public Health Dent* 1997;57:48-58.
19. Vargas CM, Dye BA, Hayes KL. Oral health status of rural adults in the United States. *J Am Dent Assoc* 2002;133:1672-81.
 20. Gilbert GH, Duncan RP, Heft MW, Dolan TA, Vogel WB. Oral disadvantage among dentate adults. *Community Dent Oral Epidemiol* 1997;25:301-13.
 21. Riley JL 3rd, Gilbert GH, Heft MW. Orofacial pain: racial and sex differences among older adults. *J Public Health Dent* 2002;62:132-9.
 22. Riley JL 3rd, Gilbert GH, Heft MW. Orofacial pain-related communication patterns: sex and residential setting differences among community-dwelling adults. *Pain* 2002;99:415-22.
 23. Arcury TA, Bernard SL, Jordan JM, Cook HL. Gender and ethnic differences in alternative and conventional arthritis remedy use among community-dwelling rural adults with arthritis. *Arthritis Care Res* 1996;9:384-90.
 24. Andersson HI, Ejlertsson G, Leden I, Schersten B. Impact of chronic pain on health care seeking, self care, and medication: results from a population-based Swedish study. *J Epidemiol Community Health* 1999;53:503-9.
 25. Jones HP, Brand MK. Providing rehabilitative services in rural communities: report of a conference. *J Rural Health* 1995;11:122-7.
 26. Hoffman PK, Meier BP, Council JR. A comparison of chronic pain between an urban and rural population. *J Community Health Nurs* 2002;19:213-24.
 27. Riley JL 3rd, Gilbert GH, Heft MW. Health care utilization by older adults in response to painful orofacial symptoms. *Pain* 1999;81:67-75.
 28. Riley JL 3rd, Gilbert GH, Heft MW. Race/ethnic differences in health care use for orofacial pain among older adults. *Pain* 2002;100:119-30.
 29. Verbrugge LM. Triggers of symptoms and health care. *Soc Sci Med* 1985;20:855-76.
 30. Cairns CB, Garrison HG, Hedges JR, Schriger DL, Valenzuela TD. Development of new methods to assess the outcomes of emergency care. *Acad Emerg Med* 1998;5:157-61.
 31. Hostutler JJ, Taft SH, Snyder C. Patient needs in the emergency department: nurses' and patients' perceptions. *J Nurs Adm* 1999;29:43-50.
 32. Thompson DA, Yarnold PR. Relating patient satisfaction to waiting time perceptions and expectations: the disconfirmation paradigm. *Acad Emerg Med* 1995;12:1057-62.
 33. Ducharme J, Barber C. A prospective blinded study on emergency pain assessment and therapy. *J Emerg Med* 1995;13:571-5.
 34. Powers LJ, Grana JR, Keen ND, Hanchak NA. Preventive service utilization as a predictor for emergency dental examinations. *Community Dent Health* 2000;17:20-3.
 35. Gilbert GH, Rose JS, Shelton BJ. A prospective study of the validity of self-reported use of specific types of dental services. *Public Health Rep* 2003;118:18-26.
 36. Roberts RO, Bergstralh EJ, Schmidt L, Jacobsen SJ. Comparison of self-reported and medical record health care utilization measures. *J Clin Epidemiol* 1996;49:989-95.
 37. Ajzen I, Fishbein M. Understanding attitudes and predicting social behavior. Englewood Cliffs (NJ): Prentice Hall; 1980.
 38. Mechanic D. Illness behavior: an overview. In: McHugh S, Vallis TM, editors. *Illness behavior: a multidisciplinary model*. New York: Plenum Press; 1985.
 39. Edwards C, Keefe F. New directions in research on pain and ethnicity: a comment on Riley, Wade, Myers, Sheffield, Pappas, and Price (2002). *Pain* 2002;100:211-2.
 40. Edwards CL, Fillingim RB, Keefe F. Race, ethnicity and pain. *Pain* 2001;94:133-7.