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## Who is Referred for Sedation for Dentistry and Why?

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## Abstract

**Objective**—To assess referrals to sedation examining dental anxiety and background of patients and compare these characteristics to those referred to a restorative dentistry clinic.

**Design**—Descriptive, cross sectional survey and chart review.

**Subjects and Methods**—Subjects were 100 consecutive new patients in Sedation and Special Care and 50 new patients in Restorative Dentistry at Guy's and St Thomas NHS Foundation Trust. A questionnaire included demographics, self-reported oral health and dental attendance, and dental fear. Information from the patient's record was taken: ASA Classification, previous sedation or general anaesthesia, and alcohol and tobacco use, and medications.

**Results**—The best predictors of referral were dental anxiety level and an irregular attendance. The most important fears were seeing, hearing and feeling the vibrations of the dental drill, and the perception of an accelerated heart rate. Other factors, such as general, mental and dental health, and alcohol use were related to referral but less important.

**Conclusions**—Referral is consistent with the goal of the Sedation Clinic to see anxious patients. Referring general practitioners are able to identify these patients.

## Introduction

A large proportion of adults in the United Kingdom are afraid of dentists (Nuttall et al., 2001)<sup>1</sup>. Approximately one in four adults in the UK delays seeking help for a painful dental condition as a result of their dental fear. Similarly, as many as one-in-five adults in North America is fearful of the dentist (Smith & Heaton, 2003)<sup>2</sup>. The prevalence of dental anxiety has not changed markedly in the last 30 years, in spite of more modern and less painful dental technology.

Fear and anxiety lead to avoidance of dental treatment, which in turn leads to impaired oral health (McGrath and Bedi, 2003)<sup>3</sup>. Research throughout the world has shown repeatedly that disadvantaged and medically compromised populations have the greatest levels and frequencies of dental fear<sup>3-9</sup>

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As a result of irregular attendance and delay in seeking treatment, individuals with dental fear tend to be referred for specialist dental care and receive treatment under sedation or general anaesthesia. Data from the Business Services Authority for 2003 (the last year for which data are available), suggests that in primary care alone over £6 million was spent on treatment under sedation. This is an underestimate of the total cost because does not include the costs of secondary care and the Community Dental Service nor the time lost from productive work and other activities associated with dental infections. Irrespective of the cost, services are often in short supply making the question of how these services are rationed of public health importance<sup>10</sup>.

### **Objective**

To assess the process of referral to a Sedation Clinic by examining the dental anxiety level and background of patients seeking care being referred and compare these characteristics to those of patients seeking care at the restorative dentistry clinic.

### **Design**

This is a descriptive, cross sectional study.

### **Setting**

The study was conducted in the departments of Sedation and Special Care Dentistry and Restorative dentistry at Guy's and St Thomas NHS Foundation Trust. The study was conducted between January and June 2007 in the Division of Restorative Dentistry

### **Subjects and methods**

100 consecutive patients on a new patient clinic in the department of sedation and special care dentistry and 50 patients attending new patient clinics in restorative dentistry at Guy's and St Thomas NHS Foundation Trust. Patients being evaluated for the sedation clinic (SC) have been referred because their general dental practitioner has been unable to provide dental care due to their anxiety. Patients attending the restorative clinic (RC) have been referred for complex dental problems.

Patients were approached by a member of the staff while waiting to be seen by the dentist. At the SC they were told "We hope that by finding out why people are anxious about coming to the dentist we will be able to improve our service." At the restorative clinic patients were given the same information but additionally told "You might not be very anxious yourself but we plan to compare results with people attending our anxiety clinics." The number of people refusing to take part in each setting was documented.

The study was reviewed and approved by the Research Ethics Committee of St Thomas' Hospital. The survey was confidential and the informed consent of each participant was obtained.

A 34-item written questionnaire was administered after confirmation that the patients was able to read and write English and were happy to answer questions. The questionnaire included demographic information, self reported oral health (4-point Likert-like scale ranging from poor to excellent), self reported dental attendance (5-point Likert-like scale ranging from "only when I need to" to "more often than every 6 months") and reasons for visits to the dentist (emergency treatment or routine checkup cleaning or filling), anxiety regarding dental injections (5 items ranging from not at all true to absolutely true),<sup>11</sup> and a general measure of dental fear (Dental Fear Survey (DFS, 20 items, 5-point scales) as well as the subscores on the DFS for Anticipation, Specific Fears and Physiology.<sup>12</sup> Additional items were included in the questionnaire to capture other aspects of dental anxiety. The

questionnaire was pretested before use. Information was taken from the patient's medical record: American Society of Anesthesiologists Classification (ASA), previous sedation or general anaesthesia for dentistry and alcohol and tobacco use and a note made of medication taken by the patients

The data were entered into Excel, edited, and analysed using SPSS (Statistical Package for the Social Sciences, version 13).

### Main outcome measures

The main outcome variable was treatment at the Sedation and Special Care Dentistry Clinic (SC) or the restorative dentistry clinic. In regression analysis, this variable either took the value of 1 when the patient was seen at the SC or 0 when treated in the restorative dentistry clinic.

### Results

One hundred consecutive new patients from the SC (77% female, mean age 36.5 years, range 16 to 67) and 50 consecutive new patients from the Restorative Clinic (52% female, mean age 42.4 years, range 15 to 75) participated in the study. There were three people who declined to take part in the sedation group and none in the restorative group. The level of education reached by the participants in the two groups is summarised in Table 1. Of the sedation group 81% were white as were 70% of the restorative group (35/50), the self-reported ethnicity of the participants is shown in Table 1.

The typical patient reported "poor" dental health (SC mode **poor** 52% RC mode **fair** 40%). There was a difference in self-reported dental health between the clinics. (Table 1)

There was a difference in self-reported attendance between the clinics. (SC mode 'only when I need to' 51%; RC mode 'about every 6 months' 66% (chi-square 47.5). There was also a significant difference in the reasons for attending 55% of the sedation patients attended only for emergency treatment while 48% of restorative patients attended for routine care (Table 1).

The majority of the patients in both clinics had never had sedation or a general anaesthetic for dental care before (SC 72% had not had a previous sedation or GA; RC 92% had not had a previous sedation or GA). Fifty-nine of 150 patients were either ASA II (55/150) or ASA III (4/150). There was no difference in the ASA between clinics although all four ASA III patients were in the SC.

Overall 47% patients in the SC (mean 15.7 years, range 1 to 30) and 26% patients in the Restorative clinic (mean 14.0 years, range 1 to 40) used tobacco. The typical patient self-reported consuming 3 units of alcohol (SC 3.7 mean, range 0–35; RC 2.1 units mean, range 0–14). Sixty-five percent of patients reporting not using any alcohol. Fifty-seven percent of those in the SC reported using alcohol versus only 16 percent of those in the RC (Fisher's Exact Test,  $p < .0001$ ).

The total Dental Fear Survey score (DFS) for the two clinics was 69.8 (18.9 SD, 20–97 range) for the SC and 35.1 (13.6 SD, 20–68 range) for the RC. There was a difference in DFS score  $t=9.8$ . The distribution of the scores for the two clinics is shown in Figure 1.

The two clinics also differed in the same manner on each of the three subscores ( $t=11.2$ , 8.5, and 9.9 respectively).

- Anticipation (SC Mean (SD) =9.8 (3.0); RC Mean (SD) =4.6 (1.8)

- Specific Fears (SC Mean (SD) =42.0 (12.7); RC Mean (SD) =23.4 (9.4)
- Physiology (SC Mean (SD) =17.7 (5.3); RC Mean (SD) =8.4 (3.8)

Table 2 gives the individual items in the DFS. The two clinics differed in the importance of various fears. Among the top five fears, the three items addressing the dental drill, overall fear and the physiological response to fear of a high heart rate were most important in the SC. In the RC, the three drill items also appeared in the top five but the overall fear and physiological response questions were rated lower. The only item where there was no significant difference between the two clinics was in taking impressions.

The 5 items of the dental injection fear instrument were added to give a score from 5 to 25, where 25 indicates a maximal fear of dental injections. The mean score was 16.6 (7.0 SD 5–25 range) for the SC and 9.6 (4.3 5–19 range) RC. There were differences between the populations  $t=6.3$ . The individual item responses are given in Table 3.

The responses to the two questionnaires are highly correlated ( $R=0.53$ ,  $p<0.001$  for the SC and  $R=0.67$ ,  $p<0.001$  for the RC).

### Cross sectional analyses

Scores on the DFS were dichotomised using the previously established cut-off of 37. When the fearful patients in each clinic were compared, the SC population is more likely to be male (44 v 19%, chi square=6.6, df 1,  $p=.01$ ) and be more poorly educated (0 levels 65 v 24%, chi square=24.0, df 4,  $p<0.0001$ ).

A logistic regression analysis was conducted where the type of clinic referral (SC v R) was examined relative to patient characteristics (sex, age, education, regular attendance, tobacco and alcohol use, mental health, and use of medications). The results show that patients who are fearful and have had a pattern of irregular attendance are 5.9 and 4.9 times respectively more likely have been referred to the SC ( $p<0.05$ ). Other characteristics of the patients were not independently related to the referral site in this multivariable analysis.

### Conclusions

A previous study of referrals to secondary care found that most were for sedation.<sup>13</sup> These investigators found that three-of-10 of these patients opted for psychological treatment for their fears. Nevertheless very few psychological services are available for dentally anxious individuals in the UK or elsewhere. As a result, many avoid dentistry altogether, while others only agree to referral for dental treatment under sedation or general anaesthesia, which is in short supply and expensive. Increasing the availability of conjoint treatment with psychological interventions of proven efficacy addressing fears and sedation used to facilitate urgent care will increase access to dental services consequential improvements in oral health and general well being. The impact of oral ill health on general health and quality of life is established and is particularly marked in individuals with dental anxiety.<sup>14</sup>

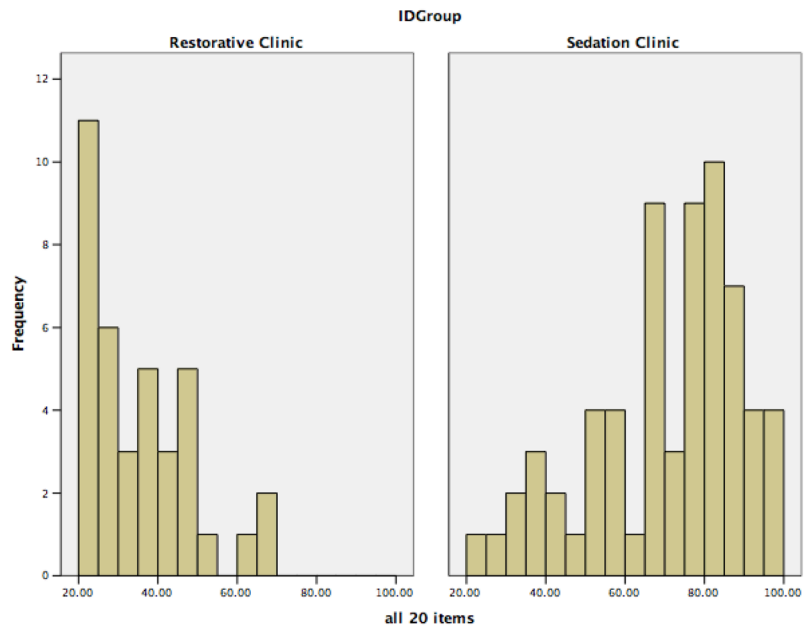
Addressing the two objectives of the study, we determined that 62% of the Sedation Clinic patients had high dental fear (score over 37) 18% in the Restorative Clinic. There were significantly more high anxiety patients in the Sedation Clinic than in the Restorative clinic making the Sedation clinic an appropriate venue for research and clinical trials on the treatment of fearful dental patients. Participation in the study was high suggesting the patients are typical of those being referred by their general dental practitioner because they are too anxious to receive treatment in a normal setting.

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**Figure 1.**  
Dental Fear Survey Score by Clinic

**Table 1**

Summary of the demographic characteristics of participants from Sedation and Restorative clinics.

	Participants from Restorative clinic (n=50)	Participants from Sedation clinic (n=100)
<i>Highest Education level</i>		
O levels	8	57
A levels	7	10
BTEC	3	12
Degree	8	8
Postgraduate Qualifications	9	3
Missing data	(15)	(10)
Chi-square=26.9 p<0.001		
<i>Ethnicity</i>		
White British a	27	65
White Irish a	0	4
White English a	3	6
White Scottish a	0	1
White Welsh a	2	0
White Portuguese a	0	2
White Spanish a	1	0
White Turkish a	0	1
White Turkish Cypriot a	1	1
Other White a	1	1
British Indian b	3	1
Other Asian b	0	2
Black Caribbean b	4	3
Black British b	2	7
Mixed Black b	0	1
Other Black b	1	0
Middle Eastern b	2	0
Iraqi b	1	1
Mixed White and Black Caribbean b	0	2
Mixed White and Black African b	0	1
Mixed White and Asian b	1	0
Not stated	1	1
Categories were grouped as shown by a and b superscripts for comparison Chi-square=		
<i>Self-reported Oral Health</i>		
Poor	6	52
Fair	20	26
Good	18	20
Excellent	6	1

	Participants from Restorative clinic (n=50)	Participants from Sedation clinic (n=100)
Chi-square=27.8 p<0.001		
<i>Reason for Attendance</i>		
Routine	16	55
Emergency treatment	24	25
Other	10	19
Missing data		(1)
Chi-square=9.1 p<0.05		



Table 2

Frequencies of responses to individual items on the Dental Fear Survey by participants attending Sedation clinic (n=100) and Restorative clinic (n=50).

Item	Participants attending Restorative clinic (n=50)					Participants attending Sedation clinic (n=100)						
	Not at all	A little	Somewhat	Much	Very much	Not at all	A little	Somewhat	Much	Very much		
How much anxiety do each of the following cause you ...												
Making an appointment for dentistry	39	4	4	0	1	26	29	19	5	17	Chi <sup>2</sup> =38.9, p<0.001	
Approaching the dentist's surgery	32	6	7	3	0	16	23	18	20	22	Chi <sup>2</sup> =42.1, p<0.001	
Sitting in the waiting room	24	17	4	2	1	17	16	21	23	22	Chi <sup>2</sup> =36.3, p<0.001	
Being seated in the dental chair	18	20	5	5	1	8	10	21	20	39	Chi <sup>2</sup> =51.5, p<0.001	
The smell of the dentist's surgery	30	14	3	1	0	22	12	19	18	28	Chi <sup>2</sup> =43.8, p<0.001	
Seeing the dentist walk in	34	11	2	1	0	25	15	20	10	29	Chi <sup>2</sup> =40.2, p<0.001	
Seeing the anaesthetic needle	18	12	8	5	5	15	11	13	17	42	Chi <sup>2</sup> =22.7, p<0.001	
Feeling the needle injected	15	14	7	6	5	13	19	7	13	44	Chi <sup>2</sup> =20.1, p<0.001	
Seeing the drill	15	11	9	8	5	7	8	7	18	58	Chi <sup>2</sup> =39.6, p<0.001	
Hearing the drill	16	10	9	6	6	6	12	5	12	63	Chi <sup>2</sup> =44.2, p<0.001	
Feeling the vibrations of the drill	15	9	10	6	8	4	10	6	12	64	Chi <sup>2</sup> =41.6, p<0.001	
Having your teeth cleaned	25	10	8	4	0	13	14	16	20	27	Chi <sup>2</sup> =35.4, p<0.001	
Having x-rays put in my mouth	34	7	5	1	1	40	17	15	13	12	Chi <sup>2</sup> =14.3, p<0.001	
Having models or impressions of my mouth	23	12	4	4	4	33	18	15	9	16	Chi <sup>2</sup> =5.0, ns	
All things considered, how scared are you of	19	16	12	2	0	6	8	5	15	66	Chi <sup>2</sup> =80.2, p<0.001	

Item	Participants attending Restorative clinic (n=50)					Participants attending Sedation clinic (n=100)						
	Not at all	A little	Somewhat	Much	Very much	Not at all	A little	Somewhat	Much	Very much		
How much anxiety do each of the following cause you ... having dentistry done ?												
	Never	Once or Twice	A few time	Often	Nearly every time	Never	Once or Twice	A few time	Often	Nearly every time		
Has fear of dentistry ever caused you to put off making an appointment?	44	5	0	0	0	41	42	0	15	0		Chi <sup>2</sup> =31.4, p<0.001
Has fear of dentistry ever caused you to cancel or not turn up for an appointment?	13	18	9	4	2	6	16	18	14	35		Chi <sup>2</sup> =30.0, p<0.001

**Table 3**

Frequencies of responses to individual items on the Fear of Injections scale by participants attending Sedation clinic (n=100) and Restorative clinic (n=50).

Item	Participants attending Restorative clinic (n=50)					Participants attending Sedation clinic (n=100)						
	Not at all true	A little true	Somewhat true	Very true	Absolutely true	Not at all true	A little true	Somewhat true	Very true	Absolutely true		
Concerning dental injections I believe that ...												
Nothing is as painful as a needle in my mouth	22	11	12	1	2	17	11	24	13	32	Chi <sup>2</sup> =28.0, p<0.001	
Seeing the needle is terrifying	19	17	11	2	0	15	16	14	16	39	Chi <sup>2</sup> =37.7, p<0.001	
Seeing the needle come closer to my mouth is scary	17	18	7	5	2	15	11	14	14	41	Chi <sup>2</sup> =32.4, p<0.001	
I don't know why needles are so terrifying to me. They just are !	26	13	7	2	0	20	15	13	10	38	Chi <sup>2</sup> =33.8, p<0.001	
Just the idea of the needle penetrating my body is terrifying	24	14	6	3	2	26	14	16	9	35	Chi <sup>2</sup> =22.2, p<0.001	