



Project USAP 2000 – Use of sedative agents by pediatric dentists: a 15-year follow-up survey

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Abstract

Purpose: A national survey of members of the American Academy of Pediatric Dentistry was conducted to provide a 15-year update of information regarding the use of sedative agents by pediatric dentists.

Methods: All 3,315 active members of the Academy were sent questionnaires regarding the frequency of their use of sedation and 1,778 responded. Practitioners were questioned regarding their use of sedative agents and the nature of their patients receiving sedation. In addition, they were questioned in regard to their use of restraints and reasons for change in their use of sedation during the past two years.

Results: In regard to the use of nitrous oxide alone, 47% of practitioners responded that they use nitrous oxide less than 11% of the time. In regard to other types of sedative agents, most practitioners use little, if any, sedation. Eighty-two percent use sedation for less than 11% of their patients. Of the 1,778 respondents, 1,224 used drugs other than nitrous oxide. In a typical three-month period, they performed 77,112 sedations. Of that number, 61,662 (80%) were administered by only 478 practitioners who use sedation on the average of once or greater each day.

Conclusions: In comparison with previous surveys in 1985, 1991 and 1995, these results demonstrate an overall increased use of sedation by pediatric dentists. However, the increased use is due primarily to an increase in the numbers of practitioners who are heavier users of sedation (once or greater each day). (*Pediatr Dent.* 2002;24:289-294)

KEYWORDS: CONSCIOUS SEDATION, SEDATIVE AGENTS, PEDIATRIC DENTISTRY

Children who present with behavioral problems in the dental operatory usually are managed with non-pharmacologic methods. Individuals who cannot communicate adequately, such as infants or severely retarded persons, often manifest severe behavioral problems, and they usually require sedation or general anesthesia to receive dental treatment. Sedation use varies widely around the country and many factors, other than the needs of the patient, affect the use of sedative drugs. This paper reports results of a survey of active members of the American Academy of Pediatric Dentistry conducted in 2000. It followed similar surveys in 1985, 1991 and 1995¹⁻³ and, consequently, it represents a 15-year follow-up on the use of sedative agents in the United States.

Methods

During the fall of 2000, all 3,315 active members of the American Academy of Pediatric Dentistry in the United States were sent questionnaires regarding the frequency of

their use of sedation. Practitioners representing all geographic areas of the United States, various types of training programs and various lengths of time in practice, were questioned concerning their use of nitrous oxide and other sedative agents. They were asked about the frequency of their use of sedative agents, the percentage of their patients who were normal as compared to handicapped, the ages of their patients receiving sedation, reasons for changes in their use of sedation during the past five years, their use of restraint during sedation, the methods used for monitoring patients during treatment, the usual drugs used together with the typical dosage and the typical effect of those drugs and the prevalence of undesirable side effects. The survey findings were compared with the findings of the 1985, 1991 and 1995 survey results.

Results

Survey results are presented in Tables 1 through 12 and, in most instances, they are compared with the findings of the

Table 1. Participants in Project USAP*

| | 1985 | 1991 | 1995 | 2000 |
|-----------------------------|--------|--------|--------|--------|
| Total number of respondents | (1105) | (1497) | (1676) | (1778) |
| Response rate(percent) | (54) | (59) | (62) | (54) |
| Type of training | | | | |
| Grandfathered | 9 | 3 | 2 | 2 |
| University-based | 47 | 47 | 58 | 23 |
| Hospital-based | 31 | 40 | 40 | 27 |
| Combined | 13 | 10 | – | 48 |
| Area of practice | | | | |
| Northeast | 25 | 27 | 27 | 26 |
| South/Southeast | 27 | 30 | 29 | 30 |
| Midwest | 25 | 24 | 24 | 20 |
| West | 21 | 19 | 20 | 23 |
| Years of practice | | | | |
| 1-5 | 18 | 19 | 20 | 19 |
| 6-10 | 30 | 19 | 15 | 15 |
| 11-15 | 23 | 24 | 18 | 13 |
| 16-20 | 10 | 19 | 19 | 15 |
| 20+ | 19 | 19 | 28 | 39 |
| Diplomate status | | | | |
| Diplomate | 19 | 34 | 35 | 35 |
| Non-diplomate | 81 | 66 | 65 | 65 |

*Figures shown as percent of respondents

earlier surveys. Table 1 describes the characteristics of the 1,778 respondents to the 2000 survey (54% response rate). Almost half indicated that they were graduates of a combined university/hospital based program, representing a substantial change in type of training indicated on previous surveys. In regard to area of practice, the different sections of the country were well represented with a slight increase in the percentage of respondents in the south/southeast section. This distribution was similar to the distribution of practitioners with the previous surveys. In regard to years of practice, there were more older practitioners who responded in comparison to the previous surveys. Almost twice as many practitioners who had been in practice for greater than 20 years responded to the survey in comparison to those with similar years of practice who responded in the earlier surveys. The distribution of respondents according to diplomate status (35%) was similar to the percentage of diplomates in the Academy.

Table 2 presents the frequency of use of sedative agents. Practitioners were asked what percentage of their patients was sedated only with nitrous oxide, and 47% of practitioners indicated that 10% or less of their patients were sedated with only nitrous oxide (15 + 19 + 13%). This was similar to the percentage of use of nitrous oxide reported in the previous surveys (55% in 1985, 57% in 1991 and 53% in 1995). The 22% of the respondents who use nitrous oxide

Table 2. Frequency of Use of Sedative Agents*

| | 1985 | 1991 | 1995 | 2000 |
|---|--------|--------|--------|--------|
| Percent of patients sedated only with nitrous oxide | | | | |
| 0% | 19 | 18 | 18 | 15 |
| 1-5% | 24 | 26 | 23 | 19 |
| 6-10% | 12 | 13 | 12 | 13 |
| 11-25% | 12 | 14 | 15 | 16 |
| 26-50% | 11 | 12 | 12 | 15 |
| >50% | 22 | 17 | 20 | 22 |
| | 100% | 100% | 100% | 100% |
| Percent of patients sedated with other sedative agents | | | | |
| 0% | 23 | 26 | 28 | 29 |
| 1-5% | 52 | 50 | 43 | 39 |
| 6-10% | 14 | 13 | 15 | 14 |
| 11-25% | 7 | 7 | 10 | 10 |
| 26-50% | 3 | 3 | 3 | 5 |
| >75% | 1 | 1 | 1 | 2 |
| | 100% | 100% | 100% | 100% |
| Percent of sedated patients (other than nitrous oxide) who were handicapped | | | | |
| | 13 | 11 | 13 | 7 |
| Percent of sedated patients (other than nitrous oxide) who were ages (yrs.): | | | | |
| 0-2 | 41 | 34 | 27 | 17 |
| 3 | 34 | 38 | 39 | 33 |
| 4-5 | 16 | 19 | 22 | 28 |
| 6-10 | 6 | 6 | 7 | 12 |
| >10 | 3 | 3 | 4 | 5 |
| Number of patients sedated (other than nitrous oxide) in a three-month period | | | | |
| Number of practitioners | 802 | 1043 | 1138 | 1224 |
| Average per practitioner | 42 | 32 | 52 | 63 |
| Total for all practitioners using sedation | 33,683 | 33,208 | 59,216 | 77,112 |

*Figures shown as percent of practitioners

on more than 50% of their patients was similar to the percent of respondents in the previous surveys who used that amount of nitrous oxide.

Twenty-nine percent of practitioners indicated that they did not use any other sedative agents, and that was a slight increase in the percentage that did not use sedative agents in 1985 (23%). However, there was a slight increase in the percentage of practitioners who were heavier users of other sedative agents (ie, those using sedative agents on more than 25% of their patients). These represented 7% of respondents compared to 4% in each of the previous surveys. Nevertheless, the percentage of sedated patients who were

Table 3. Percent of Patients Sedated Only with Nitrous Oxide as Measured by Area of Practice, Type of Training, Years of Practice and Diplomate Status*

| | 0% | 1-5% | 6-10% | 11-25% | 26-50% | >50% | |
|--------------------------|----|------|-------|--------|--------|------|------|
| Area of practice | | | | | | | |
| Northeast | 21 | 24 | 15 | 15 | 11 | 14 | 100% |
| South/Southwest | 12 | 15 | 11 | 15 | 18 | 29 | 100% |
| Midwest | 13 | 20 | 13 | 19 | 15 | 19 | 100% |
| West | 13 | 16 | 19 | 19 | 14 | 24 | 100% |
| Type of training | | | | | | | |
| Grandfathered | 46 | 23 | 4 | 4 | 12 | 12 | 100% |
| University | 20 | 21 | 12 | 15 | 13 | 19 | 100% |
| Hospital | 13 | 18 | 16 | 18 | 15 | 19 | 100% |
| Combined | 12 | 18 | 13 | 17 | 15 | 26 | 100% |
| Years of practice | | | | | | | |
| 1-5 | 8 | 12 | 16 | 18 | 18 | 26 | 100% |
| 6-10 | 7 | 20 | 14 | 21 | 16 | 23 | 100% |
| 11-15 | 14 | 22 | 15 | 17 | 15 | 17 | 100% |
| 16-20 | 14 | 21 | 15 | 18 | 14 | 20 | 100% |
| 20+ | 21 | 20 | 11 | 13 | 12 | 22 | 100% |
| Diplomate status | | | | | | | |
| Diplomate | 15 | 17 | 13 | 16 | 15 | 25 | 100% |
| Non-diplomate | 14 | 22 | 14 | 18 | 14 | 18 | 100% |

*Figures shown as percent of practitioners in 2000

Table 4. Percent of Patients Sedated with Other Sedative Agents as Measured by Area of Practice, Type of Training, Years of Practice and Diplomate Status*

| | 0% | 1-5% | 6-10% | 11-25% | 26-50% | >50% | |
|--------------------------|----|------|-------|--------|--------|------|------|
| Area of practice | | | | | | | |
| Northeast | 42 | 40 | 10 | 6 | 2 | 1 | 100% |
| South/Southwest | 20 | 38 | 16 | 14 | 7 | 4 | 100% |
| Midwest | 35 | 37 | 14 | 9 | 4 | 1 | 100% |
| West | 22 | 40 | 16 | 12 | 7 | 3 | 100% |
| Type of training | | | | | | | |
| Grandfathered | 48 | 22 | 7 | 4 | 11 | 7 | 100% |
| University | 34 | 37 | 11 | 10 | 6 | 2 | 100% |
| Hospital | 27 | 44 | 15 | 9 | 3 | 1 | 100% |
| Combined | 27 | 37 | 15 | 11 | 6 | 3 | 100% |
| Years of practice | | | | | | | |
| 1-5 | 25 | 41 | 15 | 12 | 5 | 3 | 100% |
| 6-10 | 22 | 41 | 19 | 10 | 5 | 2 | 100% |
| 11-15 | 25 | 43 | 12 | 10 | 9 | 2 | 100% |
| 16-20 | 26 | 41 | 15 | 9 | 4 | 4 | 100% |
| 20+ | 36 | 35 | 12 | 11 | 5 | 2 | 100% |
| Diplomate status | | | | | | | |
| Diplomate | 31 | 37 | 14 | 10 | 6 | 2 | 100% |
| Non-diplomate | 25 | 43 | 16 | 10 | 5 | 2 | 100% |

*Figures shown as percent of practitioners in 2000

handicapped (7%), was almost half the percentage reported in the earlier surveys. In regard to the ages of the patients sedated with agents other than nitrous oxide, there was an increased percentage of older children (age 6 and above), with 17% for the 2000 survey as compared with 11% for the 1995 survey and 9% for both the 1985 and 1991 surveys.

The total number of patients sedated with agents other than nitrous oxide in a three-month period was substantially increased in the 2000 survey, with 77,112 compared to 33,683 in 1985. While this was partially due to a greater number of respondents in the 2000 survey, it was also due to a greater average number of patients sedated in 2000 (63) as compared with 1985 (42). However, the increased average was due primarily to an increase in the numbers of practitioners who are heavier users of sedative agents, other than nitrous oxide (once or more every day). Eighty percent of the sedations in the year 2000 were performed by 478 practitioners who used sedation once or greater each day as compared with 55% of the sedations in 1995 that were administered by 182 practitioners using sedation once or more each day. Consequently, it appears that the increased sedation use in the year 2000 was due primarily to a heavier use of sedation by a small percentage of the respondents and does not represent increased use by the majority of practitioners.

The data in regard to use of nitrous oxide and use of other sedative agents was subdivided in regard to area of practice, type of training, years of practice and diplomate status (Tables 3 and 4.) In these tables, the percent of practitioners who

Table 5. Changes in Frequency of Use*

| | 1991 (n=1043) | 1995 (n=1138) | 2000 (n=1328) |
|-----------|------------------|------------------|------------------|
| Increased | 12 | 17 | 19 |
| Decreased | 31 | 21 | 28 |
| No change | 57 | 62 | 53 |
| | 100% | 100% | 100% |

*Percent of practitioners using sedation

Table 6. Reasons for Change in Frequency of Use (2000)

| | |
|---|-----|
| Increased use(n=255) | |
| More patients require sedation | 82% |
| More prepared to use sedation | 40% |
| More difficult to use general anesthesia | 35% |
| Other reasons | 29% |
| Decreased use(n=376) | |
| Less patients require sedation | 27% |
| Better able to manage patients without sedation | 60% |
| Less difficult to use general anesthesia | 55% |
| Difficult to comply with Academy guidelines | 15% |
| State legislation made sedation difficult | 18% |
| Other reasons | 25% |

Table 7. Use of Physical Restraints*

| | 1995 (n=1138) | 2000 (n=1328) |
|-----------------------------------|------------------|------------------|
| None | 18† | 26 |
| Parent holding child | 15 | 28 |
| Assistant holding child | 16 | 29 |
| Wrist restraints | 6 | 9 |
| Pedi-wrap | 17 | 14 |
| Papoose board with head holder | 20 | 27 |
| Papoose board without head holder | 27 | 37 |

*Percent of practitioners who use sedation

†Total exceeds 100% as some practitioners used more than one method

Table 8. How Patients are Monitored*

| | 1985 (n=1003) | 1991 (n=1043) | 1995 (n=1138) | 2000 (n=1328) |
|-------------------------------|------------------|------------------|------------------|------------------|
| Evaluate color | 98 | 98 | 99 | 82 |
| Use of precordial stethoscope | 35 | 54 | 60 | 41 |
| Monitor pulse | 58 | 93 | 60 | 54 |
| Monitor respiration | 76 | 80 | 87 | 47 |
| Monitor blood pressure | 18 | 34 | 82 | 28 |
| Use a pulse/oximeter | – | 69 | 87 | 80 |
| Use a capnograph | – | – | 2 | 4 |

*Percent of practitioners who use sedation

use either only nitrous oxide or other sedative agents with varying percentages of their patients is indicated. In regard to the use of nitrous oxide (Table 3), twice as many practitioners use only nitrous oxide on more than 50% of their patients in the south/southwest area as compared to the northeast (29% vs 14%).

Similarly, twice as many graduates of combined university/hospital training programs use nitrous oxide with more than 50% of their patients as compared with those that were grandfathered into pediatric dentistry practice (26% vs 12%). In regard to years of practice, almost three times as many practitioners who practiced for more than 20 years did not use nitrous oxide as compared with those who were recent graduates (21% vs 8%). In regard to diplomate status, there were similar findings reported for diplomates and non-diplomates. Table 4 indicates that, in regard to use of other sedative agents, usage patterns were fairly similar in various geographic areas, types of training, years of practice or diplomate status, with the exception of more respondents in the northeast or those who were grandfathered indicating they did not use other sedative agents with many of their patients.

Changes in the frequency of use of sedation are reported in Table 5. Of the 1,328 respondents who answered this question, 53% indicated that they had not changed their use of sedation during the past five years, 28% had decreased their use and 19% had increased use of sedation. Most of the 255 respondents who had increased their use of sedation indicated that they had more patients requiring sedation (Table 6). Of the 376 practitioners who had decreased their use of sedation, most indicated that they were better able to manage patients without sedation, and that it was easier for them to use general anesthesia as an alternative management technique.

Table 7 indicates the use of physical restraints by respondents. Approximately 75% of the respondents indicated that they used some form of physical restraint during the sedation procedure, and that number was only slightly less than the number (82%) that indicated use of physical restraint in the 1995 survey.

The methods used to monitor patients during sedation are outlined in Table 8. Eighty percent of the practitioners now use a pulse oximeter during sedations, and that was similar to the number using that instrument in earlier surveys. Much fewer of the year 2000 respondents indicated that they monitored respiration or pulse as compared with the previous surveys. Only 54% monitored pulse compared with 93% in the 1991 survey. This could have been due to an increased reliance on the pulse oximeter instrument.

Practitioners indicated that they do not usually achieve an excellent result of sedation (Table 9). Rather, the typical effect of sedation is either good, in which there is some crying or movement present, or fair, in which treatment is sometimes interrupted although all treatment is completed. Almost all sedative agents, other than nitrous oxide, are now administered orally (Table 10) by pediatric dentists.

Practitioners responded that they rarely or occasionally experienced some undesirable side effects, which were usually

Table 9. Typical Effect Achieved with Sedation Other Than Nitrous Oxide (2000)*

| | |
|--|------|
| Excellent (no or slight crying) | 23 |
| Good (crying or movement, but no treatment interruption) | 50 |
| Fair (treatment interrupted, but all treatment completed) | 25 |
| Poor (treatment interrupted, only partial treatment completed) | 2 |
| | 100% |

*Percent of practitioners responding to question, n=1135

Table 10. How Drugs Other Than Nitrous Oxide Were Administered (2000)*

| | |
|----------------|------|
| Orally | 95 |
| Intravenously | 2 |
| Intramucosally | 1 |
| Intranasally | 0 |
| Submucosally | 1 |
| Other | 1 |
| | 100% |

*Percent of practitioners responding to question, n=1137

Table 11. Undesirable Side Effects Experienced (2000)*

| | |
|---------------------------------|----|
| Occurrence (respondents n=1778) | |
| None | 16 |
| Nausea | 31 |
| Vomiting | 37 |
| Excessive sleep | 15 |
| Respiratory depression | 8 |
| Other | 5 |
| Frequency (respondents n=1055) | |
| Never | 10 |
| Rarely | 61 |
| Occasionally | 27 |
| Frequently | 2 |
| Almost always | 1 |

*Percent of practitioners responding to question

either nausea or vomiting by patients (Table 11). Rarely was excessive sleep or respiratory depression experienced. However, most practitioners indicated that they had heard of other dentists who had experienced some side effects due to sedation (Table 12).

Table 13 reports the percentage of sedated patients that received particular sedative drugs or a combination of drugs. For example, of 238 respondents that use chloral hydrate, hydroxyzine and nitrous oxide, 34% indicated that they use that combination on 5% to 20% of their sedated patients, whereas 35% use that drug combination almost exclusively with more than 80% of their sedated patients. Of 361 respondents who indicated that they use oral diazepam and nitrous oxide, 67%

Table 12. Undesirable Side Effects by Other Dentists*

| | | |
|--|--------|---------|
| Heard that other dentists experienced side effects | n=1705 | 71% yes |
| Heard that morbidity or mortality was involved | n=1553 | 45% yes |
| Heard that a report was written | n=1560 | 23% yes |

*Percent of practitioners responding to question

indicated that they use that combination on 5% to 20% of their sedated patients with only 11% using the combination on more than 80% of their sedated patients. It would appear from the data that practitioners have particular drugs or drug combinations that they use most frequently to the exclusion of other drugs which are available.

Table 14 indicates the typical dose of drugs used by practitioners. In most instances, the dose is by weight. However, in some instances, for example with hydroxyzine or promethazine, a fixed dose is used. It is important to note that 18% of those that use chloral hydrate exceed the recommended dose of 50 mg/kg.

Discussion

This national survey of members of the American Academy of Pediatric Dentistry was conducted to provide a 15-year update of information regarding the use of sedative agents by pediatric dentists. The survey respondents represented a broad section of pediatric dentists practicing in the United States and were fairly well distributed in the various geographic areas of the country. The distribution of respondents

Table 13. Percentage of Sedated Patients Receiving Various Agents

| | n* | 5-20† | 21-40 | 41-60 | 61-80 | >80 |
|--|-----|-------|-------|-------|-------|-----|
| Hydroxyzine (Atarax or Vistaril) alone | 184 | 48‡ | 10 | 4 | 8 | 30 |
| Hydroxyzine and nitrous oxide | 256 | 42 | 13 | 10 | 12 | 23 |
| Chloral hydrate alone | 102 | 45 | 13 | 6 | 10 | 26 |
| Chloral hydrate and nitrous oxide | 131 | 44 | 8 | 10 | 10 | 28 |
| Chloral hydrate and promethazine (Phenergan) alone | 24 | 63 | 17 | 8 | 8 | 4 |
| Chloral hydrate, promethazine and nitrous oxide | 54 | 43 | 24 | 13 | 9 | 11 |
| Chloral hydrate and hydroxyzine alone | 104 | 39 | 10 | 13 | 12 | 27 |
| Chloral hydrate, hydroxyzine and nitrous oxide | 238 | 34 | 7 | 13 | 11 | 35 |
| Meperidine (oral Demerol) alone | 16 | 69 | 6 | 6 | 0 | 19 |
| Meperidine with nitrous oxide | 52 | 48 | 13 | 6 | 15 | 17 |
| Meperidine and promethazine | 62 | 37 | 11 | 10 | 6 | 35 |
| Meperidine, promethazine and nitrous oxide | 190 | 18 | 11 | 12 | 16 | 44 |
| Diazepam (oral Valium) alone | 195 | 70 | 9 | 6 | 2 | 14 |
| Diazepam (oral Valium) and nitrous oxide | 361 | 67 | 11 | 5 | 5 | 11 |
| Midazolam (oral Versed) and nitrous oxide | 284 | 57 | 13 | 9 | 5 | 16 |
| Midazolam (nasal) and nitrous oxide | 87 | 69 | 8 | 3 | 3 | 16 |

*n=Number of respondents reporting use of that drug regimen

†Percent of sedated patients that receive that drug regimen

‡Percent of respondents that use that drug regimen for that percentage of patients receiving drug regimen

Table 14. Typical Dose Used for Various Drugs*

| | | n | | | | | | | |
|----------------------|------|------|-------|-------|-------|-------|-------|------|------|
| Nitrous oxide % | 1064 | Dose | 30 | 40 | 50 | 60 | | | |
| | | % n | 22 | 37 | 37 | 4 | | | |
| Hydroxyzine (mg) | 609 | Dose | 25 | 40 | 50 | 75 | 100 | 1/kg | 2/kg |
| | | % n | 40 | 6 | 16 | 1 | 2 | 19 | 17 |
| Promethazine (mg) | 196 | Dose | 25 | 40 | 50 | 1/kg | 2/kg | | |
| | | % n | 38 | 2 | 2 | 54 | 5 | | |
| Chloral hydrate (mg) | 509 | Dose | 30/kg | 50/kg | 60/kg | 75/kg | 500 | 750 | 1000 |
| | | % n | 14 | 57 | 11 | 7 | 7 | 2 | 3 |
| Meperidine (mg) | 373 | Dose | 1/kg | 2/kg | 50 | 75 | | | |
| | | % n | 34 | 42 | 17 | 8 | | | |
| Diazepam (mg/kg) | 447 | Dose | 0.3 | 0.4 | 0.5 | 0.6 | Other | | |
| | | % n | 37 | 15 | 33 | 3 | 13 | | |
| Midazolam (mg/kg) | 353 | Dose | 0.3 | 0.4 | 0.5 | 0.6 | Other | | |
| | | % n | 14 | 7 | 57 | 12 | 9 | | |

*Numbers report percentage of respondents (% n) using that particular dose. All dose levels are for drugs given orally except for nitrous oxide used by inhalation.

according to diplomate status reflected the general percentage of diplomates in the Academy membership. The survey results indicated wide differences in the use of sedation by various practitioners. Since the percentage of patients classified as handicapped was relatively small, there was no specific reason to substantiate the wide variation in the use of sedation.

There was a slight decrease in the use of nitrous oxide since 1985 as represented by the percentage of practitioners that use nitrous oxide in 10% or less of their patients (55% in 1985; 57% in 1991; 53% in 1995; and 47% in 2000), and there was a similar slight reduction in the use of other sedative agents as represented by the percentage of practitioners that used other agents with 10% or less of their patients (89% in 1985; 89% in 1991; 86% in 1995; and 82% in 2000). The overall average per practitioner was greater in 2000, and that figure reflected an increase in sedation use by a relatively small number of heavy users of sedation. In the year 2000, the percentage of younger patients had decreased and there was a greater percentage of older patients receiving sedation. When the data is analyzed closely, there appears to be little consensus among practitioners in regard to the specific use of sedation.

Since Wilson⁴ has reported a wide variation in sedation experiences by postdoctoral students in training programs

around the country, it is likely that practitioners reflect the particular bias that was developed during their training in regard to the use of sedation. It appears likely that whether or not a sedative agent is used and at what dosage depends more on the experiences of the practitioner than on the type of child patient. A broad-range discussion by educators and practitioners around the country is required to develop consensus regarding the use of sedation. The American Academy of Pediatric Dentistry has established a task force on child behavior to conduct a consensus conference regarding

non-pharmacologic and pharmacologic behavior management techniques. This conference is scheduled for September 2003 and will hopefully develop a consensus to guide practitioners in regard to the use of sedative agents with children.

Conclusions

In comparison with previous surveys in 1985, 1991 and 1995, these results demonstrate an increased use of sedation by pediatric dentists in 2000. However, the increased use is due primarily to an increase in the number of practitioners who are heavier users of sedation (once or greater each day).

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