CASE WESTERN RESERVE UNIVERSITY

SCHOOL OF DENTAL MEDICINE

GRADUATE STUDIES

We hereby approve the thesis of

Lisa Austin

Candidate for the degree Master of Science

in Dentistry.

Signed: _____ (Chairperson)

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Date: 11/11/09

A STUDY OF THE ORTHODONTIC RETENTION PREFERENCES OF GENERAL DENTISTS IN THE US

By

Lisa Austin, D.M.D.

Submitted in partial fulfillment of the requirements for the degree of Master of Science in Dentistry

Thesis advisor: Manish Valiathan M.D.S, D.D.S., M.S.D.

Committee Members: Mark Hans D.D.S, M.S.D.,

Sena Narendran B.D.S, M.S.

Department of Orthodontics

School of Dental Medicine

Case Western Reserve University

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A STUDY OF THE ORTHODONTIC RETENTION PREFERENCES OF GENERAL DENTISTS IN THE US

ABSTRACT

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Lisa M Austin

The purpose of this descriptive study was to investigate retainer preferences of general dentists in the United States. Data was collected from 425 attendees of the ADA annual meeting in San Antonio, TX, by a self-administered survey. The questionnaire consisted of nineteen questions, five of which were used to characterize the sample. Subjects were requested to answer questions relating to maxillary and mandibular retention appliances, factors associated with their preference, short and long term protocols of retainer wear, and their practices relating to repair and replacement of retainers. Of the four hundred and fifty-two surveys collected, twenty-seven were excluded from the analysis (three were incomplete; twenty-four were completed by international dentists). The responses were coded

andentered into Microsoft Excel®, then exported into SPSS® for analysis.

Two thirds of dentists agreed with a retention protocol of nine months of full-time retainer wear, followed by eight hours per day for life. General dentists preferred maxillary removable retainers (84%) with Hawley (38%) and thermoplastic (34%) retainers being the most popular. An overwhelming 70% of dentists preferred fixed lingual retainers in the mandibular arch. When discussing factors for their preferences, a majority of practitioners (70-90%) believed durability, compliance, convenience, and hygiene issues were all very important. Cost was not an essential factor to dentists, as only one third of practitioners reported this factor to be very important. Hawley retainers were the most frequently broken retainers (45%), and over 60% of dentists repair retainers at least once per year. When they repair retainers, 63% charge a fee to do so, and 65% go with the original retainer design. Though dentists reported repairing/replacing retainers, the majority

(64.3%) tend to refer the patient back to their orthodontist when a new retainer is needed. While 39% of dentists believed that the orthodontist alone is responsible for retention, a majority (54%) felt that both the general dentist *and* orthodontist should be responsible. Eighty eight percent of dentists suggested that patients bring their retainers to recall appointments. Dentists in the Northeast were less likely to repair retainers, younger dentists were more likely to repair retainers, and women are more likely to think that cost, convenience, and compliance are very important factors when determining retainer preference. Additionally, general dentists who performed orthodontic treatment were more likely to make new retainers, and co-owners were less likely to perform orthodontic treatment. In conclusion, general dentists in the United States preferred maxillary removable retainers, mandiublar fixed retainers, agreed with full-time wear for several months, and tend towards favoring life-time wear.

DEDICATION

To all of my family and friends who have provided their constant and unwavering support. I am truly lucky to have such wonderful people surrounding me.

To my girls, for constantly reminding me what life is really about. We have wonderful memories, and I look forward to many more in years to come.

To my dear friend, you have been an instrumental part of my life. I truly appreciate your attitude, dedication and mentality, as well as your love of life, travel, and other passions similar to my own; for what you have taught me, I will be forever grateful.

To my Erie-loving friend, you have encouraged me to follow my dreams and your footsteps to pursue the best profession in the world. I would not be where I am without your unconditional loyalty and friendship.

To my parents, both of whom have selflessly given more than themselves since the day I was born. It is impossible to imagine better parents than you. Your endless support, encouragement, love, and kindness are The reason for where I am today, but more importantly, for who I am today.

TABLE OF CONTENTS

Page

ABSTRACT ii
DEDICATION v
TABLE OF CONTENTS 1
List of Tables 2
INTRODUCTION 3
LITERATURE REVIEW 4
LITERATURE REVIEW REFERENCES 23
STATEMENT OF THESIS 27
MANUSCRIPT 28
Manuscript References 65
APPENDECES 66
1. Survey 67
2. Institutional Review Board Exemption 73
3. Raw Data 75
4. Frequencies directly on survey 94

List of Tables

Table I - Summary of advantages and disadvantages of different retainer types 47
Table II - Summary of Characteristic Variables among surveyed Dentists 48
Table III a - Maxillary retainer preference and associated factors 49
Table III b - Mandibular retainer preference and associated factors 51
Table III c - Other Survey questions regarding retainer wear and repair 53
Table IV a - (Recoded) Maxillary retainer preference and associated factors 55
Table IV b - (Recoded) Mandibular retainer preference and associated factors 57
Table IV c - (Recoded) Other survey questions regarding retainer wear and repair 59
Table V a - Factors associated with maxillary retainer preferences 61
Table V b - Factors associated with mandibular retainer preference 62
Table V c - Factors associated with other survey questions regarding retainer wear and repair 64
Raw Data Tables 79

INTRODUCTION

Retention in orthodontics has been a challenge throughout the history of the specialty. Although it is an essential component of the care we provide to our patients, scientific basis is weak and has resulted in considerable variation among practitioners. The retention preferences of orthodontists are fairly well established (Hughes, 2007). However, the continued dental care of patients is the responsibility of the general dentist, and it is important to understand their preferences. We have identified an area where a gap in knowledge exists: the preference of the general practitioner, an essential component of the "team" as it relates to providing our patients with the best possible care. The aim of this descriptive study is to survey general dentists in the United States about their retention preferences, as well as factors relating to these preferences.

LITERATURE REVIEW

The Difficulty of Retention in Orthodontics

Retention in orthodontics has been a challenge in the history of the specialty. Over twenty years ago, Little (1988) noted that "the only way to ensure continued satisfactory alignment post-treatment is by use of fixed or removable retention for life." Parker (1989) similarly stated that retention is necessary "as long as the patient desires to maintain optimal alignment." A retrospective study found that after retention, arch length and width decrease, while crowding increases. Their sample contained 31 people, which is a relatively small number, but it is difficult to find a large number of people to follow over a twenty year period of time. Authors noted extreme individual variation and malalignment that was unpredictable (Little, 1988).

Another study by the same authors (Little, 1981) found that two thirds of patients had unsatisfactory lower anterior alignment more than ten years post-retention. Authors discussed some of the difficulties

of studying post-treatment and post-retention results following orthodontics; descriptive research can provide an association, but it cannot lead to cause-and-effect conclusions of experimental research. The assumption was that stability would eventually be reached, and the authors presumed a state of balance had been obtained once final records were taken. Little and others pointed out that "the treated case should be viewed as dynamic and constantly changing at least through the period we have studied, the third and fourth decades of life, and perhaps throughout life" (Little, 1981). These studies show some of the difficulties associated with research in retention.

Blake and Bibby's(1998) review of literature found that most arch changes occur before the age of 30, but that mandibular anterior crowding continues into the fifth decade of life. In their longitudinal investigation, Bishara and others studied dental changes in an untreated sample population of thirty people, 15 female and 15 male, who were 25 to 46 years of age. All subjects had class I molar and canine relationships, less than 4.0mm of overjet and less than 50% overbite. Their findings showed that between

14 and 25 years of age, males had an increase of 2.7 mm of anterior crowding in the mandibular arch and 1.9 mm in the maxillary arch, while females had an increase of 3.5 mm and 2.0 mm, respectively. The overjet does not change significantly over time, while overbite significantly increases (1.0 mm) in females. In addition, intercanine width decreases significantly in females by 0.6 mm in the mandibular and 0.4 mm in the maxillary arches, while males have a 0.4 mm decrease in intercanine width. Arch length decreases in males by 1.0 mm in the maxilla and 1.2 mm in the mandible, while in females, arch length decreases 1.0 mm and 0.8 mm, respectively. Although all the reported differences were statistically significant, many of them may not be clinically significant. Further, "without long term retention, patients treated to a well-aligned dentition should expect various amounts of crowding to occur in the anterior part of the dental arches" (Bishara, 1995). Although study subjects were not treated, authors noted that "these changes should be considered part of the normal maturational process and should be taken into

consideration when planning retention options" (Bishara *et al*, 1995).

In a recent retrospective study, Booth and group recognized that "despite the concern by general dentists and dental hygienists about the difficulty of cleaning around these appliances (fixed retainers) and the risk of developing periodontal problems, there have been relatively few studies of their effects on the health of the periodontium" (Booth, Edelman and Proffit, 2008). Sixty patients with lingual fixed retainers at a 20 year follow-up showed that 25% of the patients had their retainer removed outside the orthodontic office between five and twenty five years after orthodontic treatment. Of the 45 remaining patients, 38% of them required one or more repairs by the orthodontist during this twenty year period, and the other 62% of patients had no breakage. These findings suggest good rates of success with lingual fixed retainers over a long period of time and point to general dentists likely removing and repairing these retainers.

A Non-Scientific Practice

Many of the cited references about retention in orthodontics are opinion-based rather than evidence-based. Little et al. (1981) confirmed that many previous retention studies were "clinical guidelines [that] were theories based on clinical experience and personal bias, while a few were based on documented serial review of case records." (Little *et al*, 1981).

In his experience-based paper, Parker (1989) stated that "as conscientiously as I have tried to follow each patient, the fact is that when patients return to the family dentist's care, it is often difficult to follow our work as the years roll by. Unfortunately the general dentists see the long-term results; and while our friends are kind to us, others see our results more critically." Blake and Garvey (1998) noted that patients wearing bonded lingual retainers should be recalled every six months, and that there is "much controversy regarding the role of the orthodontist versus that of the referring general practitioner in this long-term maintenance." Although this finding is anecdotal and not evidence-based, it suggests that the coordination between the

orthodontist, the general dentist, and the patient regarding retention recall and maintenance is one that needs to be addressed.

In their 2006 Cochrane review of retention, Littlewood and others concluded that "there are insufficient research data on which to base our clinical practice retention at present." It was pointed out that the "evidence in this area of orthodontic research is greatly lacking, something suspected for years." When discussing retention studies, authors mentioned that the final outcome is probably stated in millimeters and the benefits questionable. Littlewood et al. concluded the review by relating the current mentality of orthodontists and what they tell their patients: "Be careful. Wear your retainers well, often, and for as long as you can." The authors note that orthodontists' recommendations to their patients are based on common sense. They reinforce that more research needs to be performed in this area, and that current retention protocols are not evidence-based.

In addition to the need for more scientific studies on retention, better coordination of post-

orthodontic care by the orthodontist and general dentist might allow for better management of our patients and an increased likelihood of good long-term stability.

Types of Retainers

The main types of retainers in use today include removable acrylic retainers (several variations), clear thermoplastic retainers, bonded lingual retainers, positioners, and spring aligners. Blake and Garvey discussed the characteristics of different types of retainers and some of the advantages and disadvantages of each (Table I). The following is a summary of the different types of retainers, as discussed by these two authors. Removable acrylic retainers have several variations, including the Hawley retainer. They have a wire framework including a labial bow and an acrylic baseplate. The labial bow allows for some adjustment for tooth movement, and some variations are made with springs. Disadvantages include initial speech difficulties, poor esthetics, and avid patient compliance. Clear thermoplastic retainers are becoming more popular and have the

advantages of reduced cost, better esthetics, and enhanced comfort. One major disadvantage is this retainer's flexibility, and the authors note that they should not be used to retain cases that have been expanded. However, this comment was not accompanied by a reference. Bonded lingual retainers are made from multistrand stainless steel archwire and are typically indirectly bonded to the lingual surfaces of teeth. Advantages are that they allow for physiologic tooth movement. Compliance is not an issue, and they maintain alignment of the lower anterior teeth. Disadvantages are possible hygiene problems and localized relapse in areas of bond failure. Spring aligners combine the idea of a removable acrylic retainer with a positioner. Made of wire and acrylic, they are fabricated from a model in which the teeth have been aligned. Slight anterior crowding can be corrected with the combination of interproximal reduction and a spring aligner (Blake and Garvey, 1998).

Retention Preferences of Orthodontists

Though studies have sought to find the best form of retention and optimal frequency of use, there are significant variations in the types and durations of retention prescribed by orthodontists. Most orthodontists do recommend a period of full-time wear of removable retainers, followed by part-time or night-time wear, which is highly variable (Hughes 2007). Recent studies have found that a large number of orthodontists are now giving their patients lower lingual fixed retainers. The descriptive study of Keim found that vacuum-formed and fixed bonded retainers are increasing in popularity. The findings from their survey-based study of 789 orthodontists indicate that approximately one third of orthodontists use fixed bonded retainers routinely in the mandibular arch. In addition, it was reported that 27.2% of respondents prescribed "permanent" retention, compared to 23.2% in 1996 and 14.7% in 1990. Even though the sample size was large, the response rate was only 9%. Thus, of the 8,812 orthodontists who were mailed the survey, only 789 responded. In addition to potential non-

response bias, this study might bring into question the representation throughout the country and whether there was equal an distribution of orthodontists in different locations (Keim, 2002).

Hughes collected data through a self-administered mail questionnaire from 2000 orthodontists throughout the country. A total of 658 responses were returned for a response rate of 32.9%, a significantly larger response rate than Keim's study. Hughes found that 40% of orthodontists were prescribing lower lingual fixed retainers for their patients, and approximately 75% of these orthodontists recommend that patients keep them for life. In addition to finding that mandibular lingual fixed retainers are gaining popularity, the author found that 58% of orthodontists prescribed maxillary Hawley retainers. Most orthodontists prescribed less than nine months of full time wear of removable retainers and then suggested part-time wear for life. In fact, 84% of orthodontists who use removable retainers recommend lifetime use (Hughes 2007). This increase in permanent retention protocols could largely be due to the findings from studies mentioned previously. The

authors also found that 46% of orthodontists have dismissed their patients by the time that their braces have been off for two years (Hughes 2007). Thus, there is a relatively large population of orthodontically treated patients in fixed retention who no longer see their orthodontist. The issue of maintenance of these retainers may become the responsibility of their general dentist and, therefore, affect the practitioner's preference.

Considerations of Fixed Retention

In their retrospective study, Dahl and Zachrisson found that lingual fixed retention is "an effective means of retaining realigned anterior teeth for at least several years." They did report wire fracture/loosening in approximately 44%(25 of 56) of maxillary and 20%(6 of 29) mandibular retainers using three-stranded spiral wire over a six year follow-up period. There was wire fracture/loosening of approximately 11% (7 of 64) maxillary and 5.8%(1 of 17) mandibular retainers using five-stranded spiral wires over a three year follow-up period. Relatively high incidences of problems were indicated, and their

reporting method separated the fracture and loosening groups. As a result, the reported incidence of problems was underestimated. The authors noted that the improved success rate of five-stranded spiral wire was probably in part due to increased clinical experience. The variation may also be due to the difference in follow-up periods for the two types of wires and the different sample sizes. In closing, authors noted that while fixed retention can be a successful and reliable form of retention, the type of malocclusion, the patient's age, their motivation to maintain a corrected result, and their ability to keep a bonded retainer clean are all important factors when deciding on the best type of retention for a particular patient (Dahl and Zachrisson, 1991).

According to Heier (1997) very limited information is available on the periodontal effects of long-term fixed retention. Pandis et al. studied the periodontal status of patients with mandibular lingual fixed retainers; the cross-sectional study had a sample size of 64 (mean age 25 years). Half of them had been in fixed retention for an average of 9.65 years, and the other 32 had fixed retention for 3-6

months. The aim of the study was to evaluate the periodontal health of the long and short-term retention groups. It was probably difficult to obtain a large number of subjects for the long-term group; however the sample size of each of the groups was relatively small. The long term group, who had their bonded retainers in place for nine to eleven years, had more calculus accumulation, marginal recession, and greater probing depths than the group that had their bonded retainer in place for three to six months. Calculus was measured with the Calculus Index (CI), and the CI values for the six mandibular anterior teeth were averaged. Marginal recession was measured as the distance between the cement enamel junction and gingival margin with a periodontal probe, while probing depth (PD) was also measured. Values of PDs greater than 3.0 mm were assigned a score of one, and the number of "ones" for each individual served as the data for analysis.

The difference in CI between the short-term and long-term groups were 0.48 and 1.21, indicating a very small difference. Twenty-five percent of people had some marginal recession long-term as opposed to none

in the short-term group. Authors also found that 30% of people long-term, compared to 3% of people short-term, had probing depths measured at more than 3 mm. There was no difference between the groups in plaque and gingival indices or bone levels (Pandis, 2007). Though these differences were small, they were statistically significant ($P<0.05$) and also might not be clinically significant. In addition, factors such as age, smoking, and brushing techniques were not taken into consideration. Pandis pointed out that deciding on a method of retention is based on several considerations including anatomic, hygiene, social, and cultural factors. They stressed "individual variability, a cautious application of retention protocols," and the "importance of close monitoring of patients through frequent recalls" as being the greatest significance(Pandis, 2007).

Survey-Based Studies

Dillman reported a wide range of response rates, frequently attributed to the quality of the survey instrument. Some characteristics of a good survey include: being self-administered, having an incentive for completion, taking minimal cost/time to the

participant, and establishing trust. Dillman discussed social exchange and the importance of understanding the survey population as well as why people may or may not respond to questionnaires (Dillman, 2007).

To date, only one study in Australia sought to discover the retention preferences of general dentists. This study surveyed general dentists who were referring patients to of one of the authors, Dr. Cerney. Surveys were mailed to 71 referring dentists, and, of these, 13 were excluded due to selection criteria. Of the remaining 58 dentists, 45 responded, for a response rate of 78%. The authors compared the preferences of general dentists in relation to partial bonded retainers (PBR's) and removable retainers (RR's). Factors including effectiveness, durability, oral hygiene, patient satisfaction, and dentist satisfaction were ranked as "very good," "good," "fair," and "poor." In addition, dentists were invited to provide open-ended comments at the end of the questionnaire. The study found that dentists preferred PBR's with regards to most of the factors, but one of their main concerns was oral hygiene with mandibular PBR's. Dentists' main concerns with RR's

was noncompliance and eventual relapse(Cerney, 2008). This study was the first of its kind, but was rather limited in the number of study participants who were referring patients to just one orthodontic practice. One might wonder whether the preferences of these general dentists might be biased since they all sent their patients to the same orthodontist. The study stated that all of the dentists'" primary experience was the looped PBR used in Dr. Cerney's 30-year-old orthodontic practice" (Cerney 2008). In addition, frequencies, trends, and opinions were established, but more detailed statistical analyses associating preferences and possible explanatory variables were unavailable.

As stated previously, Keim reported a nine percent response rate of orthodontic practitioners in the US. Though their response rate was very low, they obtained a sufficient sample size since their initial mailing was large (8,812). The final sample consisted of 789 orthodontists, and authors were able to establish statistical significance (Keim 2002). Haugejorden and Nielsen conducted a study of Norwegian general dentists by comparing two different methods of

data collection about caries prevention services. A national random sample of 479 dentists were sent a questionnaire and asked to fill out a separate form for each patient that they treated in one day. The response rate was 60%, but 24% of the sample was excluded because they did not treat adult patients. An introductory letter was sent to all randomly selected dentists explaining why the information was requested, which could have contributed to the larger overall response rate (Haugejorden, 1987).

A study by Spencer attempted to discover trends in the volume and distribution of dental services provided by dental practitioners. This study utilized a mailed survey that was sent to a random sample of Australian general dentists. The response rate was 73% in 1983 and 75% in 1988(Spencer, 1994). Lloyd and Cerney found a response rate of 78% of Australian general dentists responding to their survey regarding retention. These were all referring dentists of Dr. Cerney, and knowing him could have contributed to the large response rate in this study (Cerney and Lloyd, 2008). Wong and Freer(2004) found a 59% response rate

of Australian orthodontists in a survey of retention procedures.

A few studies in the medical and dental fields have collected data through self-administered questionnaires at professional meetings. In a Japanese study, Shigematsu surveyed surgeons at the Japanese Society of Thyroid Surgery annual meeting. The surveys were distributed to 520 attendees of the meeting, and 133 were returned for a response rate of 26% (Shigematsu, 2005). In a different study, orthodontic residents were asked to complete surveys at the annual Graduate Orthodontic Residency Program (GORP). The survey contained questions about demographic trends, future goals, and opinions about residents' orthodontic education. In addition to surveys being completed at the meeting, an additional 50 questionnaires were sent through the mail, for a total of 330. A total of 430 surveys were distributed for an overall response rate of 77% (Bruner, 2005). This high response rate could be explained by the mutual understanding of orthodontic residents about the difficulty of a thesis, and the desire to help out someone in a similar situation to their own. It is

apparent from these studies that surveys have a large range of response rates.

Although some of the previous articles vaguely discuss general dentists' roles in maintenance of retainers, the general dentists' preferences are not evidence-based, but rather, opinion-based. The general dentist is an important part of the "team" and is usually the main referral source of orthodontists. The general dentist continues to see the orthodontic patient long after retention checks at the orthodontist office have ceased. Unless they refer a patient back to their orthodontist, general dentists may be required to repair and even replace different retainers throughout the course of the patient's life, since they will be seeing the patient on a recall basis indefinitely. Thus, one of the many considerations about the form of retention may be the retention preference of the general dentist. In addition, it might be of benefit to the patient for the orthodontist to educate the general dentist regarding the maintenance and long-term follow up care of different types of retainers.

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STATEMENT OF THESIS

MANUSCRIPT

A study of the Orthodontic Retention Preferences of General Dentists in the US

Authors: Manish Valiathan, M.D.S., D.D.S, M.S.D.[1]

Lisa M Austin, D.M.D.[2]

Sena Narendran, B.D.S, D.D.P.H., M.Sc. [3]

Mark G. Hans, D.D.S, M.S.D.[4]

1. Assistant Professor, Department of Orthdontics, Case Western Reserve University School of Dental Medicine, Cleveland Ohio
2. Resident, Department of Orthdontics, Case Western Reserve University School of Dental Medicine, Cleveland Ohio
3. Associate Professor, Department of Orthdontics, Case Western Reserve University School of Dental Medicine, Cleveland Ohio
4. Professor and Chairman, Department of Orthdontics, Case Western Reserve University School of Dental Medicine, Cleveland Ohio

Corresponding Author:

Manish Valiathan, M.D.S, D.D.S, M.S.D.
Case Western Reserve University
School of Dental Medicine
Department of Orthodontics
10900 Euclid Ave.
Cleveland, OH 44106
Tel (216)368-0673
Fax(216)368-0145
Email: mxv13@case.edu

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Objectives: The purpose of this descriptive study was to discover the retainer preferences of general dentists in the US. **Methods:** Data were collected at an ADA annual meeting from 425 participants. Subjects were requested to answer questions relating to maxillary and mandibular retainers, factors associated with their preference, protocols of retainer wear, and repair/replacement of retainers. Data analysis included descriptive and analytical tests. **Results:** General dentists preferred maxillary removable retainers, (84%) with Hawley (38%) and thermoplastic (%34) being most popular. Dentists' mandibular preference (70%) was the fixed lingual retainer and cost was not as important as other factors when determining retainer preferences. 2/3 of practitioners agreed with a period of full-time wear (9 months) followed by part-time wear (8 hours/day) for life. Additionally, 54% believed that both the orthodontist and dentist should be responsible for retention. Dentists in the Northeast were less likely to repair retainers, younger dentists were more likely to repair retainers, and women were more likely to think cost, convenience and compliance are very important factors when determining retainer preference. Co-owners were less likely to perform orthodontic treatment. **Conclusions:** General dentists in the United States reported preferring maxillary removable retainers, mandiublar fixed retainers, agreed with full-time wear for several months, followed by part-time wear for life.

INTRODUCTION

Retention in orthodontics is an essential component of the clinical care provided to patients. Studies have noted that practitioners' retention protocols are opinion-based due to the lack of scientific evidence on the subject.[1,2] As a result, there is considerable variation among practitioners regarding retention types and protocols.[3,4] Even though this variation exists, retention preferences of orthodontists are fairly well established.[3,5] Hughes also noted that nearly half of orthodontists have dismissed their patients by the time their braces have been off for two years.[3] Therefore, the continued dental care of patients is often the responsibility of the general dentist and it is important to understand their preferences. The relationship between general dentists and orthodontists as it relates to the post-orthodontic care of patients is controversial, as there are no standards established for the patients' continued care.[4]

Only one limited study recently attempted to discover the retention preferences of Australian general dentists.[6] The authors compared the preferences of general dentists that related to partial bonded retainers (PBR's) and removable retainers (RR's). Factors including effectiveness, durability, oral hygiene, patient satisfaction and dentist satisfaction were ranked as "very good," "good," "fair," and "poor". The study found that dentists preferred PBR's with regards to most of the factors, but one of their main concerns was oral hygiene with mandibular PBR's. Dentists' main concern with RR's was noncompliance and eventual relapse. This was the first study of general dentists about retainer

preferences, but it was rather limited in scope (types of questions), sample size, and they were referring dentists of just one orthodontist.

We have identified an area where a gap in knowledge exists: the preference of the general practitioner, an essential component of the "team" as it relates to providing our patients with the best possible care. The aim of this descriptive study was to assess the retention preferences of general dentists in the United States, factors relating to their preferences, short and long term protocols of retainer wear, and their practices relating to repair and replacement of retainers.

MATERIALS AND METHODS

The survey instrument was developed to determine the retention protocol preferences of general dentists in the US. The instrument was also designed to identify potential explanatory variables for the retainer preferences. The initial survey was created after a review of the available literature with special attention to a previous study on the preferences of orthodontists in the US. A draft survey was pilot tested among 20 dentists from different parts of the country, and questions were discussed with each dentist to identify limitations of the survey instrument. The refined survey instrument was re-distributed to 25 dentists around the country to establish that the survey instrument was valid and the responses could be analyzed. To that end, a limited data analysis was performed on the responses received. The final survey consisted of 19 questions, 5 to characterize the sample, and 14 to answer the questions (Appendix 1). The study was approved by the Institutional Review Board at Case Western Reserve

University (Appendix 2). The survey instrument was distributed at the Annual American Dental Association meeting in 2008.

Three dental students from case helped with the data collection, and each student assistant received $100 dollars for their efforts.

From October 16-18, 2008, the self-administered questionnaires were distributed at the American Dental Association (ADA) annual meeting in San Antonio, Texas. The ADA provided Case Western Reserve with a complimentary table in the exhibit hall at the Henry B Gonzalez Convention Center, and they permitted the PI to request general dentists to complete the survey. In order to obtain the complimentary table, an application and request explaining the purpose of the survey and justifying the need for the table, were sent to the ADA. Once approved, arrangements were made for a Case Western tablecloth to be used, and liability insurance for the participation at the ADA was requested from and provided by Case Western Reserve University.

A sign was placed on the complimentary tabletop to inform dentists about the survey. The PI and the three dental students requested dentists in their vicinity to participate. No guidance was given to the respondents and no questions were answered by the PI or assistants until the survey was complete. Dentists who completed the survey were given a voucher for a complimentary cup of coffee or tea, to be redeemed in the convention center. Additional participation was obtained at the annual Delta Sigma Delta meeting, and in areas outside the convention center. A majority of the surveys were collected in the first two days, as less people were in the exhibit hall on the third day of the meeting.

Approximately 200 surveys were collected on the first day, about 150 on the second day, and around 100 on day three, for a total of 452 surveys during the three day meeting.

The completed surveys were coded for data entry into Microsoft Excel®. Participants practice location was entered as the state that was written on each survey. Years in practice was entered as the number of years written on the open-ended item, and the remaining questions were coded corresponding to the option number for each question being answered. For example, question #5 sought to determine if the dentist performed comprehensive orthodontic treatment and the answer "yes" was coded as 1 while the answer "no" was coded as 2. The columns corresponded to the survey question and each row represented a survey. The data from the surveys was entered into a Microsoft Excel® spreadsheet by the PI, and entered a second time by a dental student to verify accuracy. A number was manually entered on each survey to allow data to be entered in the same order. The coded data of the PI and the dental student were then exported into SPSS® for analyses. Differences between the two sets of data entry were detected to be approximately 0.9% of all entries (N=19,350 entries). Since the rate of error was so small, the differences in data entries were left uncorrected/verified.

The data set of the PI was then used for analyses. After preliminary review of the data, the international dentists' surveys were discarded as were unsolicited responses. Location of practice (question #1) was recoded into four regions corresponding to the US census data

Northeast (CT, MA, ME, NH, NJ, NY, PA, RI, VT), South (AL, AR, DE, D.C., FL GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV), Midwest (IA, IL, IN, KS, MI, MN, MO, NE, ND, OH, SD, WI) and West (AK, AR, CA, CO, HI, ID, MT, NE, NM, OR, UT, WA, WY).

Responses to the number of years in practice were assigned four categories-0-5 years, 6-15 years, 16-25 years and over 25 years. Items on retainer preferences were collapsed into fixed and removable (Hawley and thermoplastic) retainers. For the question on most frequently broken retainers, the answers none and other were eliminated. The question regarding frequency of repair/maintenance/replacement of retainers was collapsed into whether dentists repair retainers or not. For the question if dentists charge their patients a fee to repair retainers, "n/a" category was removed and in the question asking what is done when a patient needs a new retainer, "other" category was removed.

Once the data were recoded, frequency distributions were calculated and chi squared tests were performed to investigate any association between the independent(location, years in practice, gender, practice setting and whether orthodontic treatment is performed) and dependent variables: retention preferences, factors involved, broken retainers and repairs and factors involved in making a new retainer. In the questions that asked about factors involved in retainer preference only "very important" and "moderately important" were compared to each other, since the number of "not important" responses were low. Chi squared tests were not run on questions asking about duration/frequency of retainer wear for first nine months after debonding, duration/frequency of retainer

wear forever, types of retainers more frequently broken/damaged, who should be responsible for retention and whether patients should bring their retainers to recall appointments; these questions are reported as frequencies.

A logistic regression analysis was performed with comprehensive orthodontic treatment by general dentists as the dependant variable and certain independent variables. Significance level, alpha, was set at less than or equal to 0.05 for both the chi squared tests and logistic regression analyses.

RESULTS

A total of 452 surveys were collected, and three surveys were discarded as they were incomplete. Twenty four were completed by international dentists, which were not used

in the data analyses. A total of 425 surveys were completed by general dentists in the

United States.

Table II describes the sample characteristics and includes region of practice, years in practice, gender, practice setting and whether comprehensive orthodontic treatment is performed. Most of the categories are represented proportionately to the averages of dentists in the United States.

Table IIIa includes the frequencies (n) and percentages (%) of maxillary retainer preferences and their associated factors. Responses about the most and least beneficial retainers in the maxillary arch are included.

Table IIIb consists of the responses about mandibular retainer preferences (most and least beneficial) and associated factors. They are presented in frequencies (n) and percentages (%).

Table IIIc is a summary of the remaining questions in the survey, discussing frequency and duration of retainer wear, replacing retainers, who is responsible for retention and whether it is recommended that patients bring retainers to recall appointments; all of these are listed as frequencies (n) and percentages (%).

Tables IVa, IVb, and IVc are the tables corresponding to IIIa-c, but have been recoded as described in the Materials and Methods section. All "Don't know" answers were removed and retainer preferences were collapsed into fixed and removable retainers. Answers "none" and "other" were removed from the question asking about most frequently broken retainers and the question asking how often dentists repair retainers was collapsed into whether they repair retainers (yes vs. no). Finally, "n/a" was removed from the question asking about whether a fee is charged, and "other" was removed from the question asking about what happens when a new retainer is needed. Once again, they are presented as frequencies (n) and percentages (%).

Tables Va, Vb and Vc are summaries of the statistically significant differences (chi square tests) between the independent variables and retainer preferences (maxillary and mandibular), factors involved in retention preferences and questions regarding repair of retainers. These tables correspond with tables III and IV a-c. Table Va lists the results of maxillary retainer preference and associated factors, Vb is mandibular retainer preference and associated factors, and Vc includes the remaining questions primarily dealing with retainer repair, replacement and follow-up. The chi squared value (X^2) and p-value are listed for each test. P is statistically significant at $P< 0.05$.

DISCUSSION

The current study was designed to identify general dentists' preferences with regards to retention protocols. We acknowledge and reiterate that these findings do not in any way constitute evidence as the "best" practices in retention.

The demographics of the participants revealed that approximately 50% of dentists were from the South, 20% resided in the Midwest, 11% were in the Northeast and 21% lived in the West. A 2006 report from the ADA showed that 30% of dentists were from the South, while 21% were from the Midwest, 23% lived in the Northeast and 26% were in the West.[7] The distribution of the current sample is similar in two regions (Midwest and West), but revealed that the Northeast is under-represented. Also, we did obtain a greater number of participants from the South and this is not a surprising finding considering the venue for the ADA annual conference was San Antonio.

In our sample, nearly 80% of the practitioners were male which is consistent with reports from ADA[7] (in 2006, 19.2% of dentists were female) and a study published aimed at establishing gender differences. According to the 2001 study, 14% of general dentists in the US were female, and the number was projected to rise to 29% by 2020.[8]

The distribution of age/years in practice was very similar between our sample and the 2006 ADA report. According to the ADA, approximately 30% of dentists were 45-54 years of age (ADA reports average age of a graduating dentist is 27), which means that people of this age have been in practice for 16-25 years.[7] Our sample revealed that 30% of dentists had been in practice for 16-25 years.

Similarly, the ADA reported that 35% of dentists are over 55 years of age (over 25 years in practice), while our sample revealed that around 40% of dentists have been in practice for over 25 years. This shows that our sample was consistent with the average age/years in practice of dentists in the United States.

Over 60% of the respondents owned their own practices. This finding was relatively similar to the ADA, which reported that 75% of dentists in private practice were solo practitioners. Our sample found that 14.7% of dentists were partners, while the ADA reports that 1 in 7 dentists were in partnerships (14.3%). Additionally, of the dentists in our study, 20% performed their own orthodontic treatment. Similarly, a 1996 study revealed that 19.3% of general practitioners were performing comprehensive orthodontic treatment and an un-published master's thesis by John Eckhardt found that 11.3% of dentists in Ohio were performing comprehensive orthodontic treatment.[9,10]

Overall, the characteristics of our sample are very representative of the target population. The one exception is region of practice, as discussed previously, where the South is over-represented and the Northeast is under-represented.

Around 67% of the general dentists agreed with at least 20 hours of removable retainer wear (defined as full time wear) for the first 9 months after the removal of fixed appliances and at least 8 hours per day thereafter forever. Our findings of general dentists' opinions with regards to frequency and duration of retainer use confirms Hughes' findings of orthodontists' preferences.[3] He reported that approximately 60% of orthodontists prescribe a period of full time wear (3- 9 months) for removable retainers, followed by eight hours per day

(67%) thereafter. Hughes points out that an assumption of night time wear is advised for these eight hour periods. In addition, they found that 84% of orthodontists recommend lifetime retainer use[3]

An overwhelming number of general dentists in the US prefer removable upper retainers (84%) and cite compliance (97.5%), durability (73.2%) and hygiene (73.4%) as very important factors for their choice. The Hawley (38%) and thermoplastic (34%) retainers were the preference while only 14% felt a fixed retainer was the most beneficial in the maxillary arch. These findings are not entirely different than orthodontists' maxillary retainer preference, as orthodontists decidedly prefer removable retainers as well (nearly 89%).[3] However, Hughes (2007) found greater utilization of the Hawley retainers (58%) and slightly lower usage of the clear thermoplastic retainer (30%).

Over 70% of the participants preferred mandibular fixed retainers. Compliance (90.4%), durability (76.5%) and hygiene (70.5%) were ranked as "very important" factors for their choice. Not surprisingly, 80% of the dentists felt removable retainers were least beneficial in the lower arch versus 56% who felt that way in the maxillary arch. This could be due to the greater tendency for lower anterior crowding post-orthodontic treatment and continued mandibular growth throughout life. It does not seem to make much difference whether the practitioner performs orthodontic treatment, as 63% of dentists who do not perform orthodontic treatment and 59% who do perform comprehensive orthodontic treatment thought the fixed retainer was the most beneficial mandibular retainer. The percentage of dentists who prefer mandibular fixed

retainers are substantially greater than the orthodontists' preference, indicated by Hughes' study. In their study, they found that 40% of orthodontists preferred mandibular fixed retainers. Similarly, a survey by Keim found that approximately one third of orthodontists were prescribing mandibular fixed retainers.[5] Thus, general dentists prefer mandibular fixed retention significantly more than orthodontists.

When asked about retainers that they saw most frequently damaged, dentists thought that Hawley retainers (45%) were broken most often. On close examination, the data points to over 60% of the general dentists repairing retainers (at least once a year) and 63% of dentists who repair retainers charge to do so. Yet, while dentists feel comfortable repairing retainers, the vast majority (64.3%) refers patients back to an orthodontist if a new retainer is needed. Compliance (90.2%), durability (73) and hygiene (72.1%) rank as very important factors for their decision on which type of new retainer to make, though 65% tend to go with the original retainer design. For a dominant proportion of our sample, compliance, durability and hygiene consistently ranked as "highly important" factors in their preference of the retainer type (irrespective of maxillary or mandibular and regardless of whether it was the first retainer or a replacement device). Cost was not regarded highly important for nearly a third of the respondents.

While 39% of dentists think that the orthodontist alone is responsible for retention, more dentists (54%) think that the general dentist and orthodontist should be responsible.

A surprising finding is that a reported 88% of dentists suggest that patients bring their retainers to their recall appointments. Considering the number of dentists that do not repair or replace retainers, it is interesting that so many dentists want to see retainers at patients' recall visits.

Approximately 1/3 of dentists report that they do not know what is the least beneficial retainer in the maxilla or mandible. In addition, 12% do not know the most beneficial maxillary retainer and 10% do not know the most beneficial mandibular device. Among providers of comprehensive orthodontic care, 24% do not know the least beneficial maxillary and 21% report not knowing the least beneficial mandibular retainer. The wide range of retention protocols adopted by orthodontists reported by Hughes, coupled with the information from our study, points to the lack of evidence in retention practices and choices currently being adopted.

Chi square tests were performed to detect associations between the independent variables and retainer preferences as well as the factors for the dentists' preferences. In addition, they were performed on questions asking about the most frequently broken retainers, replacing retainers, whether a fee is charged, whether they make a different retainer than originally given and factors relating to this decision. Responses about frequency/duration of retainer wear, responsibility for retention, and if dentists have patients bring their retainers to recall appointments were reported as frequencies.

In our sample, only 1 of 44 dentists (2%) in the NE region performs orthodontic treatment. This indicates that dentists in the NE area are the least

likely to perform orthodontic treatment. We also found that dentists in the NE region are less likely repair retainers, and more likely to send the patient back to their orthodontist when a new retainer is needed. Though statistically significant, these results must be viewed with caution, as the region was under-represented in the sample.

Practitioners who have been in practice for less than 5 years are more likely to think that fixed retainers are the least beneficial maxillary retainer. Dentists in practice for less time (0-5 years) are also more likely to make new retainers themselves and more frequently repair retainers. Dentists that have practiced for 6-15 years and over 25 years are slightly more likely to think that removable is the least beneficial maxillary retainer. These findings are statistically significant and suggest that less experienced practitioners are repairing and replacing retainers more frequently. This seems to make logical sense, as younger dentists are more likely to expand their clinical scope. It may also suggest that Dental Schools are doing a better job educating the younger graduates on the fabrication and maintenance of orthodontic retainers.

We found significantly more women thought cost, convenience and compliance were very important when determining retainer design.

Dentists who perform comprehensive orthodontic treatment were found to be more likely to make new retainers themselves, make a different type of retainer than the orthodontist prescribed, and are more likely to repair retainers.

A logistic regression was performed to find predictors of general dentists who perform orthodontic treatment. The only significant factor was the practice

setting, with co-owners less likely to perform orthodontic treatment than the other groups: owner, employee and independent contractor. One possible explanation would be that these offices are more likely to be high-volume, insurance practices. Performing comprehensive orthodontic treatment is perhaps less productive in such a setting.

Strengths of this study include that the survey was pilot tested twice to develop a valid survey instrument. A strong response rate is an added strength of the study. Lastly, this study attempted to fill a gap in knowledge that exists in our profession.

A limitation of the current study was a disproportionately large number of people from Texas and therefore, the Southern region being over-represented in the sample. In contrast, the Northeast region was under-represented. Lastly, due to the number of chi-square tests the data set was subjected to, there is the possibility that some of the significant findings were due to chance.

CONCLUSIONS

General dentists in the US reported that they preferred maxillary removable and mandibular fixed retainers. All factors (durability, compliance, convenience and hygiene) with the exception of cost were very important to a majority of dentists when deciding on the type of retainer. Most practitioners agreed with full-time initial wear followed by eight hours per day forever. In addition, most referred their patient back to the orthodontist when a new retainer was needed, but many also repaired retainers at least once a year and charged a fee to do so. Around half of dentists thought that both the dentist and the

orthodontist were responsible for retention. Younger dentists are more likely to repair retainers, and females are more likely to think compliance, convenience and cost were "very important" when determining their retainer preferences. Those dentists who were co-owners were less likely to perform comprehensive orthodontic treatment in their practice.

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Table I - Summary of advantages and disadvantages of different retainer types

Retainer	Advantages	Disadvantages
Hawley	-Labial bow allows for some adjustment	-Initial speech difficulties -Poor esthetics -Demands compliance
Clear Thermoplastic	-Reduced cost -Better esthetics -Ease of fabrication -Comfort	-Flexibility -Should not use in expansion cases(opinion-based)
Bonded lingual	-Allow for physiologic tooth movement -Compliance not an issue -Maintain alignment of lower anterior teeth	-Possible hygiene problems -Localized relapse in areas of bond failure
Positioner(prefabricated) Positioner(custom)	-Can make minor tooth movements -Can make minor tooth movements	-Cannot compensate for individual tooth size variation *Should only be used temporarily, if at all -Cost -Delay in fabrication -inability to hold rotational and overbite corrections -general lack of patient compliance
Spring aligner	-Slight anterior crowding can be corrected	-Initial speech difficulties -Poor esthetics -Demands compliance

(Blake and Garvey, 1998)

Table II - Summary of Characteristic Variables among surveyed Dentists

Variable	Total n	Percent (%)
Region of Practice		
Northeast	44	10.8
South	199	48.7
Midwest	81	19.8
West	85	20.8
Years in Practice		
0-5 years	57	13.5
6-15 years	63	14.9
16-25 years	128	30.3
>25 years	175	41.4
Gender		
Male	335	80
Female	84	20
Practice setting		
solo	251	60.6
co-owner	61	14.7
employee	74	17.9
independent contractor	28	6.8
Comprehensive orthodontic treatment		
yes	86	20.3
no	337	79.7

Table III a - Maxillary retainer preference and associated factors

Variable	Total n	Percent (%)
Maxillary most beneficial		
Hawley	151	37.8%
thermoplastic	137	34.3%
fixed lingual	55	13.8%
other	9	2.3%
dont know	48	12%
Maxillary most beneficial Factors: Durability		
very important	262	73.4%
moderately important	92	25.8%
not important	3	.8%
don't know		
Maxillary most beneficial Factors: Compliance		
very important	351	97.5%
moderately important	9	2.5%
not important		
don't know		
Maxillary most beneficial Factors: Convenience	244	68.9%
very important	104	29.4%
moderately important	6	1.7%
not important		
don't know		
Maxillary most beneficial Factors: Cost		
very important	122	34.4%
moderately important	161	35.4%
not important	70	19.7%
don't know	2	.6%
Maxillary most beneficial Factors: Hygiene issues	257	72.8%
very important	86	24.4%
moderately important	8	2.3%
not important	2	.6%
don' know		
Maxillary least beneficial		
Hawley	66	16%
thermoplastic	73	17.7%
fixed lingual	120	29.1%
other	10	2.4%
dont know		

Maxillary least beneficial Factors: Durability	126	54.5%
very important	68	29.4%
moderately important	24	10.4%
not important	13	5.6%
don't know		
Maxillary least beneficial Factors: Compliance	146	63.2%
very important	44	19%
moderately important	28	12.1%
not important	13	5.6%
don't know		
Maxillary least beneficial Factors: Convenience	116	50.9%
very important	71	31.1%
moderately important	27	11.8%
not important	14	6.1%
don't know		
Maxillary least beneficial Factors: Cost		
very important	74	32%
moderately important	82	35.5%
not important	58	25.1%
don't know	17	7.4%

Table III b - Mandibular retainer preference and associated factors

Variable	Total n	Percent (%)
Mandibular most beneficial		
Hawley	38	9.3%
thermoplastic	70	17.1%
fixed lingual	256	62.4%
other	5	1.2%
dont know	40	9.8%
Mandibular most beneficial Factors:		
Durability	279	76.4%
very important	83	22.7%
moderately important	3	.8%
not important		
don't know		
Mandibular most beneficial Factors:		
Compliance	329	90.4%
very important	23	6.3%
moderately important	12	3.3%
not important		
don't know		
Mandibular most beneficial Factors:		
Convenience	246	69.3%
very important	95	26.8%
moderately important	14	3.9%
not important		
don't know		
Mandibular most beneficial Factors: Cost		
very important	130	36.5%
moderately important	150	42.1%
not important	74	20.8%
don't know	2	.6%
Mandibular most beneficial Factors:		
Hygiene issues	248	70.1%
very important	94	26.6%
moderately important	10	2.8%
not important	2	.6%
don't know		
Mandibular least beneficial		
Hawley	118	29%
thermoplastic	90	22.1%
fixed lingual	52	12.8%

other	8	2%
dont know	139	34.2%
Mandibular least beneficial Factors:		
Durability	131	57%
very important	69	30%
moderately important	19	4.5%
not important	11	2.6%
don't know		
Mandibular least beneficial Factors:		
Compliance	159	69.1%
very important	34	14.8%
moderately important	25	10.9%
not important	12	5.2%
don't know		
Mandibular least beneficial Factors:		
Convenience	123	53.2%
very important	68	29.4%
moderately important	29	12.6%
not important	11	4.8%
don't know		
Mandibular least beneficial Factors:		
Cost	71	30.9%
very important	87	37.8%
moderately important	57	24.8%
not important	14	6.1%
don't know		
Mandibular least beneficial Factors:		
Hygiene issues	124	54.4%
very important	67	29.4%
moderately important	25	11%
not important	12	5.3%
don't know		

Table III c - Other Survey questions regarding retainer wear and repair

Variable	Total n	Percent (%)
Initial Wear		
I agree	273	65.3%
Too much	133	31.8%
Not enough	12	2.9%
After first year of retention		
I agree	277	66.1%
Too much	136	32.5%
Not enough	6	1.4%
Most damaged retainers		
Hawley	155	39.1%
thermoplastic	93	23.5%
fixed lingual	96	24.2%
other	1	0.3%
none	51	12.9%
How often repair retainers		
never	153	37.2%
1-9 times per year	234	56.9%
10 or more times per year	24	5.8%
Charge to repair retainers?		
yes	173	42.3%
no	107	26.2%
n/a	129	31.5%
A patient needs a new retainer. You:		
send patient to orthodontist	261	64.3%
make new one yourself	131	32.3%
other	14	3.4%
Do you give them a different type of		
retainer	125	35.1%
yes	231	64.9%
no		
Factors when deciding on new retainer:		
Durability	89	73%
very important	30	24.6%
moderately important	3	2.5%
not important		
don't know		
Factors when deciding on new retainer:		
Compliance	111	90.2%
1.very important	11	8.9%
2.moderately important	1	0.8%

3.not important 4.don't know		
Factors when deciding on new retainer: Convenience very important moderately important not important don't know	80 38 4	65% 30.9% 3.3%
Factors when deciding on new retainer: Cost very important moderately important not important don't know	48 38 35	39.7% 31.4% 28.9%
Factors when deciding on new retainer: Hygiene very important moderately important not important don't know	88 30 4	72.1% 24.6% 3.3%

Table IV a - (Recoded) Maxillary retainer preference and associated factors

Variable	Total n	Percent (%)
Maxillary most beneficial		
Removable	288	84%
Fixed	55	16%
Maxillary most beneficial Factors:		
Durability	262	73.4%
very important	92	25.8%
moderately important	3	0.8%
not important		
Maxillary most beneficial Factors:		
Compliance	351	97.5%
very important	9	2.5%
moderately important		
not important		
Maxillary most beneficial Factors:		
Convenience	244	68.9%
very important	104	29.4%
moderately important	6	1.7%
not important		
Maxillary most beneficial Factors: Cost		
very important	122	34.6%
moderately important	161	45.6%
not important	70	19.8%
Maxillary most beneficial Factors: Hygiene		
issues	257	73.2%
very important	86	24.5%
moderately important	8	2.3%
not important		
Maxillary least beneficial		
removable	139	53.7%
fixed	120	46.3%
Maxillary least beneficial Factors:		
Durability	126	57.8%
very important	68	31.2%
moderately important	24	11%
not important		
Maxillary least beneficial Factors:		
Compliance	146	67%
very important	44	20.2%
moderately important	28	12.8%
not important		

Maxillary least beneficial Factors:		
Convenience	116	54.4%
very important	71	33%
moderately important	27	12.6%
not important		
Maxillary least beneficial Factors: Cost		
very important	74	34.6%
moderately important	82	38.3%
not important	58	27.1%
Maxillary least beneficial Factors:		
Hygiene issues	134	60.9%
very important	61	27.7%
moderately important	25	11.4%
not important		

Table IV b - (Recoded) Mandibular retainer preference and associated factors

Variable	Total n	Percent (%)
Mandibular most beneficial		
Removable	108	29.7%
Fixed	256	70.3%
Mandibular most beneficial Factors:		
Durability	279	76.5%
very important	83	22.7%
moderately important	3	0.8%
not important		
Mandibular most beneficial Factors:		
Compliance	329	90.4%
very important	23	6.3%
moderately important	12	3.3%
not important		
Mandibular most beneficial Factors:		
Convenience	246	69.3%
very important	95	26.9%
moderately important	14	3.8%
not important		
Mandibular most beneficial Factors: Cost		
very important	130	36.7%
moderately important	150	42.4%
not important	74	20.9%
Mandibular most beneficial Factors: Hygiene		
issues	248	70.5%
very important	94	26.7%
moderately important	10	2.8%
not important		
Mandibular least beneficial		
removable	208	80%
fixed	52	20%
Mandibular least beneficial Factors:		
Durability	131	59.8%
very important	69	31.5%
moderately important	19	8.7%
not important		

Mandibular least beneficial Factors: Compliance	159	72.9%
very important	34	15.6%
moderately important	25	11.5%
not important		
Mandibular least beneficial Factors: Convenience	123	55.9%
very important	68	30.9%
moderately important	29	13.2%
not important		
Mandibular least beneficial Factors: Cost		
very important	71	33%
moderately important	87	40.5%
not important	57	26.5%
Mandibular least beneficial Factors: Hygiene issues	124	57.4%
very important	67	31%
moderately important	25	11.6%
not important		

Table IV c - (Recoded) Other survey questions regarding retainer wear and repair

Variable	Total n	Percent (%)
Initial Wear		
I agree	273	67.3%
Too much	133	32.7%
After first year of retention		
I agree	277	67%
Too much	136	33%
Most damaged retainers		
Hawley	155	45.1%
thermoplastic	93	27%
fixed lingual	96	27.9%
How often repair retainers		
no	153	37.2%
yes	258	62.8%
Charge to repair retainers?		
yes	173	61.8%
no	107	38.2%
patient needs a new retainer. You:		
send patient to orthodontist	261	66.6%
make new one yourself	131	33.4%
Do you give them a different type of retainer	125	35.1%
yes	231	64.9%
no		
Factors when deciding on new retainer:		
Durability	89	73%
very important	30	24.6%
moderately important	3	2.5%
not important		
Factors when deciding on new retainer:		
Compliance	111	90.2%
very important	11	8.9%
moderately important	1	.8%
not important		
Factors when deciding on new retainer:		
Convenience	80	65%
very important	38	30.9%

moderately important not important	4	3.3%
Factors when deciding on new retainer : Cost very important moderately important not important	 48 38 35	 9.7% 31.4% 28.9%
Factors when deciding on new retainer: Hygiene very important moderately important not important	 88 30 4	 72.1% 24.6% 3.3%
Who is responsible for retention general dentist orthodontist both	 28 156 213	 7.1% 39.3% 53.7
Do you have patients bring retainers to recall appointments? yes no	 360 49	 88% 12%

Table V a - Factors associated with maxillary retainer preferences

Variables	location of practice	years in practice	gender	practice setting	perform orthodontic treatment?
maxillary most beneficial	X^2=7.764 P=0.051	X^2=2.629 P=0.452	X^2=1.027 P=0.201	X^2=.200 P=0.978	X^2=1.670 P=0.132
maxillary most beneficial factors: durability	X^2=1.526 P=0.676	X^2=5.915 P=0.116	X^2=2.063 P=0.151	X^2=0.461 P=0.927	X^2=0.035 P=0.851
maxillary most beneficial factors: compliance	X^2=1.629 P=0.653	X^2=7.204 P=0.066	X^2=2.155 P=0.142	X^2=2.340 P=0.505	X^2=0.001 P=0.977
maxillary most beneficial factors: convenience	X^2=4.152 P=0.246	X^2=5.467 P=0.141	X^2=3.192 P=0.074	X^2=5.652 P=0.130	X^2=0.109 P=0.741
maxillary most beneficial factors: cost	X^2=0.729 P=0.866	X^2=0.435 P=0.933	X^2=4.695 P=0.030*	X^2=3.824 P=0.281	X^2=1.374 P=0.241
maxillary most beneficial factors: hygiene	X^2=2.935 P=0.402	X^2=0.172 P=0.933	X^2=2.217 P=0.137	X^2=3.484 P=0.323	X^2=0.210 P=0.646

Significant at $p < 0.05$

Table V b - Factors associated with mandibular retainer preference

Variables	location of practice	years in practice	gender	practice setting	perform orthodontic treatment?
mandibular most beneficial	X^2=4.515 P=0.211	X^2=5.621 P=0.132	X^2=0.709 P=0.242	X^2=1.629 P=0.653	X^2=3.199 P=0.051
mandibular most beneficial factors: durability	X^2=1.877 P=0.598	X^2=1.499 P=0.683	X^2=0.509 P=0.475	X^2=2.540 P=0.468	X^2=0.592 P=0.442
mandibular most beneficial factors: compliance	X^2=2.425 P=0.489	X^2=3.235 P=0.357	X^2=5.936 P=0.015*	X^2=0.279 P=0.964	X^2=2.625 P=0.105
mandibular most beneficial factors: convenience	X^2=2.636 P=0.451	X^2=8.669 P=0.034*	X^2=3.999 P=0.048*	X^2=2.237 P=0.525	X^2=1.416 P=0.234
mandibular most beneficial factors: cost	X^2=1.987 P=0.575	X^2=1.086 P=0.780	X^2=4.621 P=0.032*	X^2=3.697 P=0.296	X^2=1.119 P=0.290
mandibular most beneficial factors: hygiene	X^2=2.310 P=0.511	X^2=1.970 P=0.579	X^2=1.314 P=0.252	X^2=3.008 P=0.390	X^2=0.857 P=0.355
mandibular least beneficial	X^2=6.955 P=0.073	X^2=5.808 P=0.121	X^2=1.023 P=0.215	X^2=0.843 P=0.839	X^2=2.411 P=0.082
mandibular least beneficial factors: durability	X^2=0.710 P=0.871	X^2=2.383 P=0.497	X^2=1.478 P=0.224	X^2=2.289 P=0.515	X^2=1.069 P=0.301
mandibular least beneficial factors:	X^2=1.050 P=0.789	X^2=1.032 P=0.794	X^2=0.081 P=0.775	X^2=0.762 P=0.858	X^2=1.348 P=0.246

compliance					
mandibular least beneficial factors: convenience	X^2=0.613 P=0.893	X^2=1.077 P=0.783	X^2=0.138 P=0.710	X^2=1.483 P=0.686	X^2=0.770 P=0.380
mandibular least beneficial factors: cost	X^2=5.702 P=0.457	X^2=2.936 P=0.817	X^2=0.396 P=0.820	X^2=3.014 P=0.807	X^2=0.385 P=0.825
mandibular least beneficial factors: hygiene	X^2=2.800 P=0.423	X^2=1.827 P=0.609	X^2=0.463 P=0.496	X^2=0.375 P=0.945	X^2=0.187 P=0.665

Significant at $p < 0.05$

Table V c - Factors associated with other survey questions regarding retainer wear and repair

Variables	location of practice	years in practice	gender	practice setting	perform orthodontic treatment?
how often repair retainers?	X^2=8.734 P=0.033*	X^2=7.346 P=0.062	X^2=0.206 P=0.650	X^2=11.501 P=0.009*	X^2=39.001 P=0.000*
charge a fee to repair?	X^2=2.554 P=0.466	X^2=1.552 P=0.670	X^2=0.633 P=0.426	X^2=7.386 P=0.061	X^2=.238 P=0.626
when a patient needs a new retainer, you?	X^2=12.059 P=0.007*	X^2=11.244 P=0.010*	X^2=0.386 P=0.534	X^2=8.793 P=0.032*	X^2=118.132 P=0.000*
give different retainer than orthodontist?	X^2=1.247 P=0.742	X^2=0.085 P=0.994	X^2=1.478 P=0.224	X^2=10.299 P=0.016*	X^2=19.447 P-=0.000*
factors when deciding on new retainer durability	X^2=3.460 P=0.326	X^2=0.335 P=0.563	X^2=0.422 P=0.516	X^2=1.552 P=0.670	X^2=0.461 P=0.497
factors when deciding on new retainer compliance	X^2=4.805 P=0.187	X^2=1.256 P=0.262	X^2=3.725 P=0.054	X^2=1.573 P=0.665	X^2=1.629 P=0.202
factors when deciding on new retainer convenience	X^2=8.560 P=0.036*	X^2=0.644 P=0.422	X^2=0.744 P=0.389	X^2=1.186 P=0.756	X^2=0.099 P=0.753
factors when deciding on new retainer cost	X^2=3.284 P=0.350	X^2=0.458 P=0.499	X^2=0.224 P=0.636	X^2=0.772 P=0.856	X^2=0.019 P=0.890
factors when deciding on new retainer hygiene	X^2=5.221 P=0.156	X^2=0.046 P=0.830	X^2=2.434 P=0.119	X^2=4.751 P=0.191	X^2=0.355 P=0.551

Significant at $p < 0.05$

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APPENDECES

APPENDIX 1

Survey

Retention Preferences of General Dentists in the US

How involved are you in the management of patients who have completed their orthodontic treatment are now in retainers? No one currently knows the preference of general dentists although you continue to monitor and provide a range of dental services to this large patient population. Researchers at Case Western Reserve University are conducting a nationwide survey to find out your retention preferences. The findings from this research will be published in a peer reviewed journal and presented at a national meeting. Kindly choose the answers that best reflect your preferences in the attached survey. The process will take you approximately 5 minutes. All responses will be stored securely with access limited to authorized University personnel. You will receive a voucher for coffee/a drink, to be redeemed at the convention center, as a token of appreciation on returning the completed survey. Any questions that you may have will be answered once you have completed the survey. If you choose not to participate, it will not affect your relationship with the University. Additional questions, comments or concerns can be addressed by calling Drs. M Valiathan at (216)368-0673, L Austin at (216)368-1480 or the Institutional Review Board of the University at (216)368-6925. Thank you in advance for your cooperation

1. Where is your primary location of practice?

_____

City

State

2. How many years have you been in practice? _____ years

3. Are you Male or Female? (circle one)

4. Which of the following best describes your PRIMARY PRACTICE setting? (please check one)

- ☐ Solo practice
- ☐ Co-owner
- ☐ An employee
- ☐ An independent contractor

5. Do you perform any comprehensive orthodontic treatment?

- ☐ Yes
- ☐ No

6. Patients should wear retainers **for at least 20 hours/day in the first 9 months** following active treatment. (please check one)

- ☐ I agree
- ☐ That is too much
- ☐ That is not enough

7. **After the first year of retention**, patients should wear retainers at least 8 hours/day **forever**.
(please check one)

- ☐ I agree
- ☐ That is too much
- ☐ That is not enough

8. a. What type of **maxillary** retainer do you think is the **MOST** beneficial to your patients?
(please check one)

- ☐ Hawley retainer
- ☐ Clear thermoplastic retainer
- ☐ Fixed lingual retainer
- ☐ Other. Please specify _____
- ☐ Don't Know (Skip to Q 9.a)

8. b. How important are the various factors in determining the maxillary retainer type that is most beneficial to **your patients?**

	Very important	Moderately important	Not important	Don't know
Durability				
Compliance				
Convenience				
Cost				
Hygiene issues				

9.a. **What** type of **mandibular** retainer do you think is the **MOST** beneficial to **your patients**?
(please check one)

- ☐ Hawley retainer
- ☐ Clear thermoplastic retainer
- ☐ Fixed lingual retainer
- ☐ Other. Please specify _____
- ☐ Don't know (skip to question 10 a)

9.b. How important are the various factors in determining the mandibular retainer type that is most beneficial to **your patients?**

	Very important	Moderately important	Not important	Don't know
Durability				
Compliance				
Convenience				
Cost				
Hygiene issues				

10. a.**What** type of **maxillary** retainer do you think is the **LEAST** beneficial to your patients?
(please check one)

- ☐ Hawley retainer
- ☐ Clear thermoplastic retainer
- ☐ Fixed lingual retainer
- ☐ Other. Please specify _____
- ☐ Don't know (skip to Q 11 a)

10.b. How important are the various factors in determining the maxillary retainer type that is least beneficial to **your patients**?

	Very important	Moderately important	Not important	Don't know
Durability				
Compliance				
Convenience				
Cost				
Hygiene issues				

11.a. **What** type of **mandibular** retainer do you think is the **LEAST** beneficial to **your patients**?
(please check one)

- ☐ Hawley retainer
- ☐ Clear thermoplastic retainer
- ☐ Fixed lingual retainer
- ☐ Other. Please specify _____
- ☐ Don't know (skip to Q 12)

11.b. How important are the various factors in determining the mandibular retainer type that is least beneficial to **your patients**?

	Very important	Moderately important	Not important	Don't know
Durability				
Compliance				
Convenience				
Cost				
Hygiene issues				

12. Which types of retainers do you **most** frequently see broken/damaged?
(please check one)

- ☐ Hawley retainer
- ☐ Clear thermoplastic retainer
- ☐ Fixed lingual retainer
- ☐ Other. Please specify _____
- ☐ None of the above

13. How often do you repair/maintain/replace any type(s) of retainers?

- ☐ never
- ☐ 1-9 times per year

☐ 10 or more times per year

14. Do you routinely charge your patients a fee to repair them?
☐ Yes
☐ No
☐ N/A

15. When a patient needs a new retainer, what do you do most often? (please check one)
☐ Send the patient back to an orthodontist
☐ Make a new retainer yourself (or have your staff/lab make it)
☐ Other

16. If you repair the retainer yourself do you ever give the patient something different than what their orthodontist gave them? (**if your answer is no, skip to question #18)**
☐ Yes
☐ No

17. If you do make a different retainer, how important are the various factors when making the decision on a new type of retainer?

	Very important	Moderately important	Not important	Don't know
Durability				
Compliance				
Convenience				
Cost				
Hygiene issues				

18. Who do you think should be responsible for retention of patients after orthodontic treatment?
☐ The general dentist
☐ The orthodontist
☐ Both the general dentist and the orthodontist

19. Do you suggest that patients bring their retainers to their recall appointments?
☐ yes
☐ no

Thank you for your help in completing this survey

APPENDIX 2

Institutional Review Board Exemption

Case Western Reserve University
Institutional Review Board

NOTICE OF EXEMPTION (#2)

Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures,

interview procedures or observation of public behavior

If this protocol changes, the RI and/or CI must fully complete and submit an addendum request.

PLEASE BE CERTAIN TO DESTROY EMAILS OR ANYTHING ELSE THAT COULD POSSIBLY LINK DATA WITH PARTICIPANT

Responsible Investigator: **Manish Valiathan**
Department: **Dentistry - General**
IRB Protocol Number: **20080926**
Title: ***A study of the Orthodontic Retention Preference of General Dentists in the US***
Co-Investigator: **Lisa Austin**

Exemption Date: October 1, 2008

The Institutional Review Board (IRB) has deemed the above protocol EXEMPT under 45 Code of Federal Regulations (CFR) part 46.101(b)(2). The IRB will not conduct subsequent reviews of this protocol.

Any changes to the protocol that put it under the purview of the IRB would require a formal application to, and approval of, the IRB prior to implementation of the change IRB applications are available at the CWRU IRB Pages, or from the Office of Research Compliance (ORC) at Sears Library Building, #657.

APPENDIX 3

Raw Data

Key for RAW DATA

1. Location of practice	loc	
2. Years in practice	yrs	
3. Gender	gen	male: M female: F
4. Practice setting	pract	solo: 1 co-owner: 2 employee:3 Independent contractor: 4
5. Comprehensive ortho treatment?	orthotrt	yes: 1 no:2
6. Initial wear	initwear	I agree: 1 too much: 2 Not enough: 3
7. After first year of retention	latwear	I agree: 1 too much: 2 Not enough: 3
8a. Max most beneficial	maxbest	Hawley: 1 thermoplastic:2 Fixed lingual:3 other:4 Don't know:5
8b. factors:		
Durability	dur8	very impt: 1 mod impt:2 not impt:3 don't know: 4
Compliance	comp8	very impt: 1 mod impt:2 not impt:3 don't know:4
Convenience	con8	very impt: 1 mod impt:2 not impt:3 don't know:4
Cost	cost8	very impt: 1 mod impt:2 not impt:3 don't know:4
Hygiene issues	hyg8	very impt: 1 mod impt:2 not impt:3 don't know:4
9a. Mand most beneficial	mandbest	Hawley: 1 thermoplastic:2 Fixed lingual:3 other:4 Don't know:5
9b. factors:		
Durability	dur9	very impt: 1 mod impt:2 not impt:3 don't know: 4
Compliance	comp9	very impt: 1 mod impt:2 not impt:3 don't know:4
Convenience	con9	very impt: 1 mod impt:2 not impt:3 don't know:4
Cost	cost9	very impt: 1 mod impt:2 not impt:3 don't know:4
Hygiene issues	hyg9	very impt: 1 mod impt:2 not impt:3 don't know:4
10a. Max least beneficial	maxwors	Hawley:1 thermoplastic:2 Fixed lingual:3 other:4

			Don't know:5
	10b. factors:		
	Durability	dur10	very impt: 1 mod impt:2 not impt:3 don't know: 4
	Compliance	comp10	very impt: 1 mod impt:2 not impt:3 don't know:4
	Convenience	con10	very impt: 1 mod impt:2 not impt:3 don't know:4
	Cost	cost10	very impt: 1 mod impt:2 not impt:3 don't know:4
	Hygiene issues	hyg10	very impt: 1 mod impt:2 not impt:3 don'tknow:4
	11a. Mand least beneficial	mandwors	Hawley: 1 thermoplastic:2 Fixed lingual:3other:4 Don't know:5
	11b. factors:		
	Durability	dur11	very impt: 1 mod impt:2 not impt:3 don't know: 4
	Compliance	comp11	very impt: 1 mod impt:2 not impt:3 don't know:4
	Convenience	con11	very impt: 1 mod impt:2 not impt:3 don't know:4
	Cost	cost11	very impt: 1 mod impt:2 not impt:3 don't know:4
	Hygiene issues	hyg11	very impt: 1 mod impt:2 not impt:3 don't know:4
12.	most damaged	brok	Hawley: 1 thermoplastic:2 Fixed lingual:3other:4 none:5
13.	how often repair, etc.	rep	never: 1 1-9 times per year : 2 10 or more times per year: 3
14.	charge to repair	fee	yes: 1 no:2 N/A:3
15.	pt needs new retainer	newret	send pt. to ortho: 1 make new one yourself: 2 other:3
16.	give pt. something different	diff	yes:1 no:2
17.	how impt. Different factors		
	Durability	dur17	very impt: 1 mod impt:2 not impt:3 don't know: 4
	Compliance	comp17	very impt: 1 mod impt:2 not impt:3 don't know:4
	Convenience	con17	very impt: 1 mod impt:2 not impt:3 don't know:4

	Cost	cost17	very impt: 1	mod impt:2
			not impt:3	don't know:4
	Hygiene issues	hyg17	very impt: 1	mod impt:2
			not impt:3	don't know:4
18.	responsible for retention	resp	general dentist: 1	
			orthodontist: 2	
			Both: 3	
19.	bring retainers to recall appnts	bring	yes:1	no:2

No answer where there should have been: 99
No answer where not supposed to have one: S
Multiple entry: comma between answers
Answered Q but not supposed to: p(then the number)
Didn't answer previous Q but answered reasons t(then the number)
Resident res
If something written to side- treat it as if nothing was entered(99)

Raw Data Tables

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
1	ID	28	F	3	2	2	2	3	1	1	1	1	1	3	1	1	1	1	1	5	s	s	s	s	s	5	s	s	s	s	s	1	1	2	1	2	s	s	s	s	s	99	1
2	MO	31	99	1	1	1	3	1	2	1	2	3	1	3	1	1	2	3	2	2	3	1	3	3	3	2	99	1	99	99	99	2	2	1	2	1	1	1	2	3	2	99	1
3	TX	1	F	3	1	3	2	1	2	1	1	2	1	3	2	1	1	1	1	4	2	1	1	1	1	1	2	1	1	2	1	5	2	2	2	2	2	1	1,2	99	1	3	1
4	TX	1	F	3	1	2	1	1	1	1	2	3	1	3	1	1	2	3	1	5	p4	p4	p4	p4	p4	5	p4	p4	p4	p4	p4	3	2	2	2	2	p4	p4	p4	p4	p4	3	1
5	VT	11	F	1	2	1	2	2	2	1	1	2	2	3	2	1	1	2	2	5	s	s	s	s	s	5	s	s	s	s	s	5	2	1	1	2	s	p1	s	s	s	2	2
6	SD	31	M	1	2	2	1	3	1	1	1	3	1	3	1	1	1	3	1	2	1	1	1	3	1	2	1	1	1	3	1	2	2	2	2	1	1	1	1	3	1	2	1
7	OH	19	M	1	2	1	1	2	1	1	1	2	2	3	1	1	1	1,2	1	5	p1	p1	p1	p1	p1	1	1	1	1	1	1	1	1	3	1	2	s	s	s	s	s	3	1
8	VA	20	F	1	2	1	1	2	2	1	1	1	2	3	2	1	1	1	2	5	s	s	s	s	s	5	s	s	s	s	s	5	1	3	1	99	99	99	99	99	99	3	1
9	WY	32	M	1	2	3	3	1	2	1	2	3	2	3	2	1	2	3	2	2	1	1	3	2	2	2	1	1	3	2	2	2	2	2	1	1	1	1	3	3	2	3	1
10	RI	17	F	2	2	2	1	99	99	99	99	99	99	99	99	99	99	99	99	99	t4	t4	t4	t4	t4	3	4	4	4	4	4	3	2	1	1	1	1	1	1	3	1	1	1
11	RI	19	M	2	2	1	1	1	1	1	1	3	1	3	1	1	1	3	2	5	s	s	s	s	s	5	s	s	s	s	s	1	2	1	1	1	2	1	2	2	1	2	1
12	TX	16	M	1	2	1	1	2	2	1	1	2	1	2	2	1	1	2	1	3	3	3	1	3	1	3	3	3	1	3	1	5	1	3	1	2	s	s	s	s	s	3	1
13	MI	29	M	2	1	1	1	2	1	1	1	2	1	3	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	1	2	2	2	2	s	s	s	s	s	2	1
14	TX	31	M	3	2	2	2	5	p1	p1	p1	p3	p1	3	1	1	1	3	1	5	s	s	s	s	s	5	s	s	s	s	s	1	1	3	1	99	99	99	99	99	99	2	1
15	RI	17	F	2	2	2	1	2	1	1	1	3	1	2	1	1	1	3	1	1	4	4	4	4	4	3	4	4	4	4	4	3	2	1	1	1	1	1	1	3	1	1	1
16	PW	26	F	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	3	99	99	99	99	1	1	1	1	1	1	99	1,2	2	1	2	1	1	1	1	1	1	2	1
17	MI	29	F	2	1	2	1	1	1	1	1	1	1	3	2	1	2	2	2	2	3	3	1	3	3	1	2	2	2	2	1	3	2	2	2	1	1	1	1	1	1	3	1
18	CA	1	M	4	2	1	3	1	1	1	2	2	1	3	1	1	2	2	1	5	p1	p1	p2	p2	p1	5	p1	p1	p2	p2	p1	1	2	1	1	99	t1	t1	t2	t2	t1	3	1
19	PW	30	M	1	2	2	2	3	1	1	1	3	2	3	1	1	1	3	2	1	99	1	99	99	99	1	99	1	99	99	99	5	1	3	1	99	99	99	99	99	99	2	2
20	PA	25	M	1	2	1	1	2	1	1	3	3	4	3	1	1	3	4	4	1	2	2	3	4	4	1	1	1	3	4	4	3	1	2	1	2	s	s	s	s	s	2	2
21	OH	19	M	1	2	1	1	2	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	3	1
22	OH	35	F	1	2	1	2	2	1	1	1	4	1	5	s	s	s	s	s	5	p1	p1	p1	p4	p1	5	s	s	s	s	s	5	1	1	1	2	s	s	s	s	s	3	1
23	TX	99	F	4	2	1	1	4	1	1	99	1	1	5	p1	p1	p1	p1	p1	5	s	s	s	s	s	99	99	99	99	99	99	99	99	99	99	2	s	s	s	s	s	3	2
24	MA	20	F	2	2	1	2	3	1	1	2	1	1	3	1	1	1	1	1	5	s	s	s	s	s	2	1	1	1	1	1	5	1	2	1	2	s	s	s	s	s	2,3	2
25	MA	25	M	1	2	1	2	2	2	2	2	2	2	3	2	2	2	1	1	2	2	2	2	2	2	5	s	s	s	s	s	3	1	2	1	2	s	s	s	s	s	99	1
26	AR	20	M	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	2	1	3	1	99	99	99	99	99	99	3	1
27	UT	20	M	99	2	2	1	1	1	1	2	2	2	3	1	1	2	2	2	3	4	4	4	4	4	5	s	s	s	s	s	1	2	2	1	1	3	3	3	3	3	2	1
28	TX	2	M	3	2	1	1	3	2	2	2	2	2	3	2	2	2	2	2	3	2	2	2	2	2	2	1	2	2	3	2	3	2	2	1	2	p2	p1	p2	p2	p2	3	1
29	LA	29	M	1	2	1	1	2	2	1	1	2	2	3	2	1	1	2	2	3	2	2	2	2	2	1	2	2	2	2	2	2	1	3	1	99	99	99	99	99	99	3	1
30	CT	32	M	1	2	2	1	2	2	1	1	1	1	3	2	1	1	1	1	1	3	2	2	2	2	1	2	2	2	2	2	2	1	3	1	2	s	s	s	s	s	2	1

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
31	TX	20	M	1	2	1	1	2	2	1	1	2	2	3	2	1	1	2	2	5	p4	p4	p4	p4	p4	5	p4	p4	p4	p4	p4	3	3	1	1	2	s	s	s	s	s	3	1
32	AZ	14	M	1	2	1	1	1	3	1	1	3	1	1	3	1	1	3	1	2	99	99	99	99	9	3	99	99	99	99	99	3	2	2	1	2	P2	P1	P2	P3	P1	2	1
33	SC	25	M	2	2	2	1	2	1	1	1	3	1	3	1	2	2	3	1	5	s	s	s	s	s	5	s	s	s	s	s	5	1	2	1	1	2	2	2	2	1	3	1
34	CT	18	M	1	2	1	1	5	s	s	s	s	s	3	2	1	1	2	2	5	s	s	s	s	s	1	2	1	1	2	2	1	2	1	1	2	s	s	s	s	s	3	1
35	CT	32	M	1	2	2	1	1	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	5	1	3	1	2	s	s	s	s	s	3	1
36	CT	30	M	2	2	2	2	2	1	1	1	1	1	2	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	3	2	1	1	1	1	1	1	1	1	3	1
37	TX	35	M	4	2	1	1	2	1	1	99	1	3	2	1	1	99	1	99	1	99	99	1	99	1	3	99	99	1	99	1	1	1	1	3	2	p1	p1	s	p1	s	2	1
38	TX	32	M	1	2	1	1	2	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	2	1
39	LA	17	M	3	2	1	2	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	99	99	99	99	99	99	1	2	1	99	99	99	99	99	99	99	3	1
40	TX	1	M	3	1	1	1	1	1	1	2	3	2	3	1	1	2	3	2	3	2	2	2	2	2	2	1	1	3	2	2	3	1	2	1	1	1	2	3	2	3	2
41	FL	1	M	3	1	1	1	3	2	2	2	2	2	3	2	2	2	2	2	5	p2	p2	p2	p2	p2	5	p2	p2	p2	p2	p2	2	2	1	1	2	p2	p2	p2	p2	p2	3	1
42	TX	45	M	1	2	1	2	2	1	1	1	2	1	3	1	3	2	3	2	1	1	2	1	4	2	1	1	2	1	4	2	1	1	3	1	99	p1	p1	p1	p4	p1	2	1
43	TX	27	M	1	2	2	2	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	2	2	1	1	2	2	5	1	3	1	2	s	s	s	s	s	2	2
44	TX	res	M	1	2	1	1	1	1	1	2	1	1	3	2	1	1	2	2	3	2	1	2	2	2	2	2	1	2	2	2	2	2	2	1	2	p1	p1	p1	p1	p1	3	1
45	TX	1	F	4	2	1	1	1	2	1	1	1	1	3	2	1	1	1	2	5	p2	p2	p2	p2	p2	2	2	2	2	2	2	2	1	3	1	1	1	1	1	1	1	3	1
46	TX	3	F	1	2	1	1	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	2	1	1	2	s	s	s	s	s	2	1
47	CO	42	M	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	s	s	s	s	s	99	99	99	99	99	99	99	99	99	99	2	p1	p1	p1	p1	p1	2	1
48	FL	30	M	4	1	1	2	2	1	1	1	4	1	3	1	1	1	99	99	1	1	1	1	99	99	1	1	99	99	99	99	3	2	1	2	2	s	s	s	s	s	3	1
49	IL	10	M	1	2	2	2	2	1	1	2	2	2	3	1	1	1	2	2	3	1	3	2	2	2	1	1	1	2	2	2	1	2	1	1	2	p1	p2	p2	p2	p2	3	1
50	MS	3	M	1	1	2	1	2	1	1	1	2	2	2	1	1	2	2	2	3	1	1	1	2	2	3	1	1	1	2	2	3	2	1	2	2	p1	p1	p1	p2	p2	3	1
51	IL	26	M	2	2	1	1	1	2	1	1	2	1	3	1	1	99	99	2	3	2	1	1	2	1	1	2	1	1	2	1	1	1	1	1	1	2	1	1	1	1	2	1
52	TX	15	M	2	1	2	2	2	1	1	1	1	1	2	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	2	2	1	1		1,2	1	1	1	1	3	1
53	TX	25	M	99	2	1	1	1	2	1	2	2	1	3	2	2	2	2	3	5	p2	p2	p2	p1	p2	2	2	2	2	1	2	1	2	2	1	2	p2	p2	p2	p2	p2	2	1
54	CA	30	M	2	2	2	2	4	1	1	1	2	1	3	1	1	1	2	1	5	p1	p1	p1	p2	p1	5	p1	p1	p1	p2	p1	3	2	2	2	1	1	1	1	2	1	3	1
55	TX	18	M	3	2	1	2	1	1	1	3	3	1	3	1	1	3	1	1	2	1	1	1	2	1	4	1	1	2	1	1	1	1	1	2	1	1	1	1	2	1	1	1
56	VA	40	M	4	2	2	2	1	1	1	1	1	1	3	1	3	3	3	1	5	p2	p2	s	p3	p1	5	s	s	s	s	s	1	1	1	1	2	p1	p2	p1	p1	s	2	1
57	CA	12	M	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	2	1	2	2	p1	p1	p1	p1	p1	99	1
58	NY	33	M	1	2	1	1	5	p2	p1	p2	p3	p2	3	2	1	2	3	2	5	p2	p1	p2	p3	p2	5	p2	p1	p2	p3	p2	5	1	3	1	99	99	99	99	99	99	3	1
59	MI	30	M	4	2	3	1	1	1	1	1	2	2	3	1	1	1	2	2	3	1	1	1	2	2	1	1	1	1	2	2	1	1	2	1	2	p1	p1	p1	p2	p2	2	1
60	TN	3	F	2	2	1	1	1	2	1	2	2	1	3	2	1	2	2	1	5	s	s	s	s	s	5	s	s	s	s	s	1	2	1	1	1	2	1	2	2	1	2	1

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
61	IL	1	F	2	2	1	1	1	1	1	2	3	2	3	1	1	2	3	1	2	99	99	99	99	99	2	99	99	99	99	99	3	3	2	2	2	s	s	s	s	s	3	1
62	TX	21	M	3	2	2	1	2	1	1	1	2	1	3	1	1	1	2	1	3	2	2	2	2	1	1	2	1	1	2	1	1	1	3	1	2	s	s	s	s	s	2	1
63	MN	29	M	2	2	1	1	3	1	1	1	1	1	3	1	1	1	1	1	5	s	s	s	s	s	5	s	s	s	s	s	1	2	1	1	2	s	s	s	s	s	3	1
64	WI	17	M	1	2	2	1	3	1	1	1	3	2	3	1	1	1	3	2	2	1	1	2	3	2	2	1	2	2	3	2	2	2	1	1	1	1	1	1	1	3	2	3	1
65	MO	36	M	1	2	1	2	2	1	1	2	2	1	3	1	1	1	1	1	3	3	3	3	3	3	2	3	3	3	3	3	3	2	1	1	1	2	2	2	1	1	2	1
66	TX	15	M	3	2	1	1	2	1	1	1	2	1	3	1	1	1	2	1	5	s	s	s	s	s	1	2	1	1	2	2	3	2	3	2	2	s	s	s	s	s	3	1
67	CA	26	M	1	1	2	2	2	2	1	2	3	1	3	2	1	99	3	2	1	2	1	2	3	2	1	2	2	2	3	99	1	2	1	2	1	1	1	2	3	2	3	1
68	WA	29	M	1	2	1	1	1	1	1	2	2	2	3	1	1	2	2	2	3	2	3	2	2	2	1	3	2	2	3	99	3	2	2	1	99	99	99	99	99	99	99	99
69	WI	23	M	2	2	1	1	2	2	1	2	2	2	3	2	1	2	2	2	1	2	2	2	3	99	1	2	1	2	2	2	1	2	1	1	2	p1	p2	p2	p2	s	2	1
70	TX	17	M	1	1	2	1	1	1	1	2	3	2	3	2	1	1	3	2	4	2	2	1	99	99	2	99	99	99	99	99	2	2	2	2	1	1	1	1	3	3	2	1
71	AR	22	M	1	2	1	1	1	1	1	1	1	1	3	1	1	2	1	1	5	s	s	s	s	s	5	s	s	s	s	s	1	2	1	2	2	p1	p1	p1	p1	p1	3	1
72	TX	23	M	4	2	2	2	2	1	1	1	1	1	2	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	2	2	2	2	1	1	1	1	2	1	1	1
73	VA	29	M	1	1	1	2	2	2	1	2	2	2	2	2	1	2	2	2	3	2	1	2	2	1	3	2	1	2	2	1	3	3	1	2	1	2	1	2	2	2	3	1
74	FL	19	M	1	1	2	1	2	99	99	99	99	99	2	99	99	99	99	99	5	s	s	s	s	s	5	s	s	s	s	s	3	3	1	2	1	99	99	99	99	99	3	2
75	TX	23	M	3	2	2	1	2	2	1	2	2	1	3	2	1	2	2	1	5	p2	p1	p2	p2	p1	5	p2	p1	p2	p2	p1	5	1	3	1	2	s	s	s	s	s	2	1
76	WV	15	M	2	1	1	1	2	1	1	2	3	2	2	1	1	2	3	2	1	1	2	1	2	1	1	1	2	1	2	1	1	2	1	2	1	1	2	1	2	1	3	1
77	NY	40	M	1	2	1	1	5	p1	p1	p1	p2	p1	5	p1	p1	p1	p2	p1	5	p3	p3	p3	p2	p3	5	p3	p3	p3	p2	p3	1	1	2	1	2	p1	p1	p1	p2	p1	3	1
78	FL	50	M	2	2	1	1	1,3	2	1	2	99	1	3	1	2	2	2	1	5	p1	p2	p2	p2	p1	5	s	s	s	s	s	1	3	1	1,2	1	1	2	2	2	1	3	1
79	FL	38	M	2	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	2	1	2	1	1	1	2	1	2	1	1	1	1	2	1	1	1	1	1	1	1	1	3	1
80	VA	16	M	99	2	1	1	1	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	5	s	s	s	s	s	5	1	3	3	2	s	s	s	s	s	3	1
81	CA	41	M	1	2	2	2	1	2	1	2	2	1	1	2	2	1	1	2	3	1	3	3	3	1	3	1	3	3	3	1	1	2	1	2	2	p1	p1	p2	p2	p1	3	1
82	CA	7	F	1	2	2	1	3	1	1	2	2	1	3	1	1	1	1	1	2	1	99	99	2	99	2	99	99	1	99	99	2	2	1	1	2	s	s	s	s	s	3	1
83	99	22	M	1	2	1	2	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	1	1	3	1	2	s	s	s	s	s	3	1
84	UT	14	M	1	2	1	2	5	s	s	s	s	s	3	2	2	2	2	2	4	2	1,2	2	2	2	5	p2	p1	p2	p2	p2	5	1	2,3	1	2	p2	p1	p2	p2	p2	3	1
85	TX	20	M	3	2	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	99	1	3	3	2	s	s	s	s	s	99	1
86	TN	9	M	1	2	1	2	2	2	1	2	2	1	3	1	3	2	3	1	1	2	1	2	3	1	1	2	1	3	3	1	1	2	3	1	2	s	s	s	s	s	2	1
87	CA	2	M	3	2	1	1	1	1	1	1	3	2	3	1	1	1	3	2	5	p1	p1	p1	p3	p2	5	p1	p1	p1	p3	p2	3	2	2	2	1	1	1	1	3	2	2	1
88	VA	3	F	3	2	1	1	2	1	1	1	2	1	2	1	1	1	2	1	3	4	4	4	4	4	3	4	4	4	4	4	3	2	3	2	2	s	s	s	s	s	3	1
89	MI	27	M	1	2	2	2	2	2	1	1	2	1	3	2	1	1	2	3	1	2	1	1	2	2	2	2	1	1	2	2	2	2	2	2	1	2	1	1	2	2	3	2
90	HI	40	M	2	1	1	2	1	1	1	1	1	1	3	1	1	2	1	1	3	3	3	3	3	3	2	3	3	3	3	3	1	2	2	2	2	1	1	1	1	1	2	1

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
91	HI	8	M	2	2	1	1	1	1	1	2	2	2	3	2	1	1,2	2	1	3	2	2	2	2	2	2	2	2	2	2	1	2	2	2	1	2	s	s	s	s	s	2	1
92	TX	29	M	1	1	2	1	4	2	1	1	2	2	4	2	1	1	2	2	4	2	1	1	2	2	4	2	1	1	2	2	2	3	1	2	1	2	1	1	2	2	3	1
93	GA	6	F	1	2	2	1	1	1	1	1	2	1	3	1	1	1	2	1	2	99	99	99	99	99	5	s	s	s	s	s	1	1	3	1	2	s	s	s	s	s	3	1
94	MO	15	M	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	99	99	99	99	99	2	99	99	99	99	99	2	1	3	1	2	s	s	s	s	s	2	1
95	GA	10	M	1	2	99	2	1	1	1	1	2	1	3	1	2	1	2	1	2	2	2	2	2	2	2	1	1	2	1	1	1	2	2	1	2	s	s	s	s	s	1	2
96	GA	6	M	2	2	2	1	1	1	1	1	2	1	3	1	1	1	2	1	2	1	1	1	2	1	2	1	1	1	2	1	3	1	3	1	2	s	s	s	s	s	2	1
97	TX	37	M	3	2	1	1	3	2	1	1	2	1	3	2	1	1	1,2	1	5	p2	p2	p2	p2	p2	5	p2	p2	p2	p2	p2	1	1	3	1	2	s	s	s	s	s	2	1
98	OH	19	F	2	2	2	2	2	1	1	1	2	1	3	1	1	1	2	1	3	99	99	99	99	99	1	99	3	99	1	3	3	2	2	1	2	s	s	s	s	s	2	1
99	OH	17	F	1	2	1	1	2	1	1	1	2	1	3	1	1	1	2	1	3	4	4	4	4	4	1	4	4	4	4	4	1	1	3	1	99	99	99	99	99	99	2	1
100	MN	30	M	1	2	2	1	3	1	1	1	2	1	3	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	2	2	2	1	99	t1	t1	t1	t2	t1	2	1
101	WI	35	M	1	2	2	1	3	2	1	1	1	1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	s	s	s	s	s	3	1
102	MN	3	F	3	2	1	1	2	1	1	1	2	1	3	1	1	1	2	2	5	s	s	s	s	s	5	s	s	s	s	s	3	2	2	1	99	99	99	99	99	99	3	1
103	MO	10	F	1	2	1	1,2	1	1	1	1	2	2	3	1	1	1	2	2	3	1	1	1	2	2	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	3	1
104	OH	15	M	2	2	1	2	2	1	1	1	2	2	2	1	1	1	2	2	3	2	2	1	1	2	3	2	2	2	2	2	1	2	1	1	2	s	s	s	s	s	3	1
105	MO	31	M	1	2	2	1	2	2	1	1	2	1	3	2	1	2	2	1	5	p2	p1	p1	p2	p1	5	p2	p1	p2	p2	p1	1	1	3	1	99	99	99	99	99	99	3	1
106	TX	25	M	1	2	1	2	2	1	1	1	1	1	3	1	1	1	1	1	3	2	3	3	2	3	2	2	2	3	2	3	1	2	1	1	2	s	s	s	s	s	3	1
107	TX	28	F	1	2	1	1	2	1	1	2	2	2	3	1	1	2	2	2	5	p1	p1	p2	p2	p2	1	p1	p1	p2	p2	p2	1	1	3	1	99	p1	p1	p2	p2	p2	2	1
108	CA	25	M	1	1	1	1	2	1	1	1	1	1	3	1	2	1	1	1	3	1	2	2	1	1	1	2	1	1	1	1	1	2	2	2	2	s	s	s	s	s	3	1
109	KY	32	F	3	2	1	1	2	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	5	s	s	s	s	s	1	3	1	1	2	s	s	s	s	s	3	1
110	IL	34	M	1	2	2	1	2	2	1	2	2	1	3	2	1	2	2	1	5	s	s	s	s	s	5	s	s	s	s	s	1	1	3	1	99	99	99	99	99	99	2	1
111	IL	15	F	4	2	1	2	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	1	3	1	2	99	p1	p1	p1	p1	3	1
112	MI	20	F	1	2	2	2	1	1	1	2	2	2	3	1	3	3	3	3	5	p3	p3	p3	p3	p3	1	1	2	2	2	2	1	2	1	1	2	p1	p1	p1	p2	p2	2	1
113	MI	31	M	1	1	1	2	2	2	1	1	1	1	2	2	1	1	1	1	5	s	s	s	s	s	5	s	s	s	s	s	1	2	3	2	2	p2	p1	p1	p1	p1	2	1
114	TX	8	M	1	2	2	1	1	1	1	1	2	3	3	1	1	2	2	2	2	3	2	2	3	3	2	3	3	3	4	3	2	1	1	2	2	s	s	s	s	s	2	2
115	TX	22	M	1	1	1	2	5	s	s	s	s	s	3	1	1	2	2	2	5	s	s	s	s	s	2	1	1	2	2	2	2	3	1	2	1	1	1	2	2	2	3	1
116	NY	33	M	2	2	1	2	1	1	1	1	1	4	3	1	1	1	1	4	3	3	3	3	3	1	1	3	3	3	3	1	3	2	1	1	2	s	s	s	s	s	3	1
117	TX	22	M	1	2	1	1	1	2	1	2	2	1	3	2	1	3	2	1	5	s	s	s	s	s	5	s	s	s	s	s	1	2	2	2	2	s	s	s	s	s	3	2
118	NY	8	M	3	2	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	3	3	3	3	1	1	3	3	3	3	1	1	3	1	2	p1	p1	p1	p3	p1	3	1
119	TN	26	M	2	1	1	1	1	1	1	1	2	1	3	1	1	1	2	1	3	99	99	99	99	1	5	s	s	s	s	s	2	3	1	2	2	s	s	s	s	s	2	1
120	LA	4	F	4	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	2	2	1	3	1	1	2	2	1	2,3	2	3	1	2	p1	p1	p1	p2	p1	3	1

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
121	TX	28	M	1	2	1	1	2,3	1	1	1	1	1	3	1	1	1	99	1	1	4	4	4	4	4	5	p4	p4	p4	p4	p4	1,2	2	1	1,2	2	s	s	s	s	s	2,3	1
122	TX	33	M	99	2	99	99	5	p4	p4	p4	p4	p4	5	p4	p4	p4	p4	p4	5	p4	p4	p4	p4	p4	5	p4	p4	p4	p4	p4	5	1	3	3	99	99	99	99	99	99	99	1
123	UT	3	M	2	2	1	1	1	2	2	1	2	1	3	1	2	2	2	1	3	2	2	1	2	1	1	2	1	2	2	1	2	1	3	1	99	99	99	99	99	99	3	1
124	MO	17	M	3	2	1	1	2	1	1	1	2	1	3	1	1	1	2	1	5	p1	p1	p1	p2	p1	5	p1	p1	p1	p2	p1	1	2	1	1	2	s	s	s	s	s	3	1
125	TX	5	F	3	2	1	1	1	1	1	1	1	1	3	1	1	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	3	1
126	TX	10	M	3	2	2	2	1	99	99	99	99	99	2	99	99	99	99	99	1	99	99	99	99	99	5	s	s	s	s	s	2	1	2	99	2	s	s	s	s	s	2	1
127	TX	23	M	3	2	1	3	1	1	1	2	3	2	1	1	1	2	3	1	3	2	2	2	3	1	2	2	2	2	3	1	2	2	2	2	1	1	1	1	1	1	3	1
128	TX	10	M	3	2	1	1	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	1	3	3	2	s	s	s	s	s	3	1
129	WA	23	M	4	2	1	1	1	1	1	1	1	1	3	1	1	1	1	1	5	1	1	1	1	1	2	1	1	1	1	1	1	1	3	1	2	p1	p1	p1	p1	p1	3	1
130	TX	20	F	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	5	p1	p1	p1	p1	p1	2	2	1	1	2	p1	p1	p1	p1	p1	1	1
131	HI	18	M	1	2	2	2	2	1	1	1	3	1	3	1	1	1	3	1	3	3	3	3	3	3	1	3	3	3	3	3	3	1	3	1	99	99	99	99	99	99	2	2
132	CA	22	M	3	2	2	2	5	P2	P1	P2	P1	P1	5	p2	p1	p2	p1	p1	5	p2	p2	p2	p1	p1	5	p2	p2	p2	p1	p1	5	1	3	1	2	p2	p2	p2	p1	p1	3	1
133	FL	26	M	1	2	3	1	1	99	99	99	99	99	1	99	99	99	99	99	2	99	99	99	99	99	2	99	99	99	99	99	2	2	1	2	1	99	99	99	99	99	3	1
134	FL	18	F	1	1	2	2	2	2	1	1	3	2	1	1	1	1	2	1	5	s	s	s	s	s	2	1	1	1	2	1	3	2	2	2	1	1	1	2	2	1	1	1
135	IL	31	M	1	2	2	1	1	1	1	1	2	1	3	1	1	1	2	1	2	1	1	1	2	1	2	1	1	1	2	1	2	1	3	1	99	99	99	99	99	99	99	99
136	CA	20	F	1	1	1	1	2	1	1	1	3	1	2	1	1	2	3	1	4	99	99	99	99	99	1	1	1	1	3	2	1,2	2	1	2	1	1	1	1	3	2	3	1
137	VT	14	M	2	2	2	2	3	1	1	1	3	1	3	1	1	1	3	1	5	s	s	s	s	s	5	s	s	s	s	s	2,3	1	3	1	99	99	99	99	99	99	2	2
138	TX	29	M	1	1	99	99	1,2	2	1	1	3	2	2	2	1	1	3	1	3	2	1	1	3	1	1	2	3	3	1	3	3	1	1	3	1	2	1	1	3	1	3	1
139	MS	30	M	1	1	1	2	2	1	1	1	3	1	3	1	1	1	3	1	5	s	s	s	s	s	5	s	s	s	s	s	1	3	2	2	2	s	s	s	s	s	3	1
140	NV	19	M	1	2	1	1	1	2	1	1	2	2	3	1	1	1	2	1	5	s	s	s	s	s	5	s	s	s	s	s	1	1	3	1	2	s	s	s	s	s	2	1
141	CA	40	M	1	2	1	1	1	1	1	1	2	1	2	1	1	1	2	1	2	1	1	1	2	1	3	1	1	1	2	1	1	2	3	1	2	1	1	1	2	1	3	1
142	TX	10	M	1	2	1	1	3	1	1	1	99	99	3	1	1	1	1	1	2	2	1	2	3	3	2	1	1	1	2	2	5	1	3	1	2	s	s	s	s	s	3	1
143	TX	33	M	1	1	2	1	2	2	1	1	1	1	2	2	1	1	1	1	2	1	2	2	1	1	1	1	1	2	2	1	1	2	2	2	2	1	2	1	1	1	3	1
144	CA	4	F	1	2	2	1	3	1	1	1	1	1	3	1	1	1	1	1	5	s	s	s	s	s	5	s	s	s	s	s	1	1	3	2	2	s	s	s	s	s	3	1
145	CO	30	M	1	2	1	2	3	2	1	1	1	1	3	1	1	1	2	2	2	4	3	4	4	4	5	p4	p4	p4	p4	p4	2	1	3	1	2	p1	p1	p1	p1	p1	2	1
146	FL	20	M	1	1	2	2	1	1	1	2	1	1	3	1	1	1	1	1	2	1	1	1	2	1	2	1	1	1	1	1	2	3	2	1	2	p1	p1	p1	p1	p1	1	1
147	IN	51	M	99	2	1	2	1	1	1	1	2	1	3	1	1	1	2	1	3	1	1	1	2	1	5	s	s	s	s	s	1	1	2	1	2	s	s	s	s	s	3	1
148	TX	29	M	4	2	1	1	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	1	3	1	2	s	s	s	s	s	3	1
149	MD	23	M	1	2	1	1	2	2	1	1	2	1	3	1	1	1	2	1	3	1	1	1	2	1	1	2	1	1	2	2	5	1	3	1	99	99	99	99	99	99	2	2
150	TX	34	M	1	2	1	1	5	s	s	s	s	s	3	1	1	1	2	1	5	s	s	s	s	s	2	1	1	1	2	1	1	1	3	1	2	s	s	s	s	s	2	1

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
151	TX	29	M	3	2	1	2	1	1	1	2	2	2	3	1	3	2	2	2	3	2	1	1	2	2	2	2	1	1	2	2	1	2	2	1	2	s	s	s	s	s	3	1
152	NJ	44	M	3	2	1	1	1	1	1	1	2	1	3	1	1	1	2	1	2	1	1	1	2	1	1	1	1	1	2	1	2	1	3	1	2	s	s	s	s	s	3	2
153	KY	1	M	4	2	1	1	1	2	1	1	2	1	3	1	2	2	2	2	5	p2	p1	p2	p2	p1	1	p2	p1	p2	p1	p2	5	1	3	1	2	p2	p1	p2	p1	p1	2	2
154	NC	33	F	1	2	1	99	3	1	1	1	1	1	3	1	1	1	1	1	5	s	s	s	s	s	5	s	s	s	s	s	1	1	3	1	2	p1	p1	p1	p1	p1	2	1
155	NC	25	M	1	2	2	1	1	1	1	2	3	1	1	1	1	2	3	1	2	1	1	1	3	1	3	1	1	1	3	1	3	1	3	1	2	p2	p2	p2	p1	p1	2	2
156	UT	4	M	1	2	1	1	2	1	1	1	1	1	2	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	3	2	2	2	1	1	1	1	1	1	2	1
157	OR	33	M	1	2	2	2	1	1	1	2	3	2	3	1	1	2	3	3	3	2	3	3	1	2	2	2	3	3	1	2	2	2	1	2	1	1	2	2	3	1	3	1
158	PA	34	M	1	2	1	1	1	1	1	1	2	1	1	1	1	2	2	1	2	99	99	99	99	99	99	99	99	99	99	99	2	2	1	2	2	1	1	2	2	1	2	1
159	NE	26	M	1	1	2	1	3	1	1	2	2	2	3	1	1	2	2	2	1	1	1	2	2	2	1	1	1	1	2	2	3	2	2	1	1	1	1	1	1	2	2	1
160	MA	4	F	3	2	1	1	1	1	1	1	1	1	3	1	1	1	1	1	5	p1	p1	p1	p1	p1	5	p1	p1	p1	p1	p1	1	1	3	1	2	p1	p1	p1	p1	p1	3	1
161	CA	5	M	1	2	1	1	1	2	1	2	2	2	1	2	1	2	2	2	5	p2	p2	p1	p1	p2	5	p2	p2	p2	p2	p2	2	1	1	2	2	p2	p2	p2	p2	p2	3	1
162	TX	20	M	1	1	2	2	2	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	2	s	s	s	s	s	3	1
163	TX	15	M	1	2	3	3	1	1	1	2	2	1	3	1	2	2	2	1	2	1	1	2	2	1	1	1	1	2	2	1	2	2	2	2	1	1	1	2	2	1	3	1
164	IL	4	99	1	2	1	1	5	s	s	s	s	s	2	99	99	99	99	99	3	99	99	99	99	99	2	1	1	1	1	1	1	2	1	1,2	2	p1	p1	p1	p1	p1	3	1
165	FL	20	M	2	2	1	1	2	1	1	2	3	2	3	1	1	3	3	2	3	1	1	3	3	2	1	1	1	3	3	2	1	2	1	1	2	p1	p1	p3	p3	p2	2	1
166	FL	22	F	2	2	1	1	3	1	1	1	2	1	3	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	2	2	1	1	1	1	1	1	2	1	3	2
167	CA	36	M	1	2	3	1	2	1	1	1	2	1	2	1	1	1	2	1	3	2	1	1	1	1	3	1	2	1	1	1	1	2	1	1	2	s	s	s	s	s	3	1
168	PA	35	M	1	2	1	2	1	1	1	2	2	2	3	1	3	3	2	3	5	s	s	s	s	s	1	1	1	1	2	2	3	2	1	1	1	99	99	1	99	99	3	1
169	MI	12	M	1	2	2	1	1	1	1	1	1	1	99	1	1	1	1	1	3	99	99	99	99	1	3	99	99	99	99	1	1,2	99	99	1	99	99	99	99	99	99	2	1
170	KS	8	F	3	2	1	1	3	99	1	1	1	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	3	2	2	s	s	s	s	s	99	1
171	IL	30	M	1	2	1	1	1	1	1	1	1	1	3	1	1	1	1	1	3	3	3	3	3	3	1	3	3	3	3	3	1	1	3	1	2	p4	p4	p4	p4	p4	3	1
172	TX	40	M	1	1	1	1	5	s	s	s	s	s	5	s	s	s	s	s	5	p4	s	s	s	s	5	p4	s	s	s	s	5	1	3	1	2	p1	s	s	s	s	3	2
173	ME	26	M	1	2	1	3	3	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	5	s	s	s	s	s	2	1	3	1	2	s	s	s	s	s	99	2
174	IL	31	M	1	1	2	1	1	1	1	1	99	1	3	1	1	1	1	1	1	99	99	99	99	99	1	99	99	99	99	99	1	2	1	2	2	p1	p1	p1	p1	p1	2	1
175	LA	24	M	1	2	1	1	1	1	1	2	2	2	3	1	1	1	2	2	5	s	s	s	s	s	5	s	s	s	s	s	5	1	3	1	1	1	1	2	3	2	3	1
176	HI	24	M	1	2	1	1	2	1	1	3	3	1	3	1	1	1	1	1	5	p1	p2	p2	p3	p3	1	2	2	2	2	2	1	2	1	2	99	99	99	99	99	99	99	99
177	TX	2	F	3	2	2	2	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	1	2	1	1	2	s	s	s	s	s	2	1
178	LA	24	M	1	2	2	2	1	1	1	2	3	1	1	1	1	2	3	1	3	1	1	1	3	1	3	1	1	1	3	1	3	1	3	1	99	t1	t1	t1	t3	t1	3	1
179	NY	25	M	1	2	1	1	2	1	1	1	1	1	2	1	1	1	1	1	5	s	s	s	s	s	5	s	s	s	s	s	1	2	1	1	2	p1	p1	p1	p1	p1	2	1
180	CA	2	F	4	2	2	1	1	1	1	1	1	1	3	1	1	1	1	1	5	p4	p4	p4	p4	p4	5	p4	p4	p4	p4	p4	1	1	3	1	2	p1	p1	p1	p1	p1	2	2

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
181	TX	35	M	1	2	1	1	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
182	TX	5	M	2	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1	3	2,4	4	4	4	4	5	p4	p4	p4	p4	p4	3	3	1	2	1	2	1	1	1	1	3	1
183	TX	3	F	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	2	p1	p1	p1	p1	p1	3	1
184	LA	38	M	3	2	1	1	2	1	1	1	1	1	3	1	1	1	1	99	5	p1	p1	p1	p1	p1	1	p1	p1	p1	p1	99	1	1	3	1	2	s	s	s	s	s	3	1
185	MI	42	F	2	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	2	99	99	99	99	99	2	99	99	99	99	99	1	2	1	2	1	1	1	1	1	1	3	1
186	MI	41	M	2	1	1	1	3	1	1	1	1	2	3	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	3	1	2	2	s	s	s	s	s	2	1
187	SC	29	M	1	1	1	1	3	1	1	1	3	1	3	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	3	1	1,2	2	1	3	2	s	s	s	s	s	2	1
188	OH	25	M	1	1	2	1	1	1	1	2	2	2	1	1	1	2	2	2	2	1	1	2	2	2	2	1	1	2	2	2	3	2	1	2	2	p1	p1	p2	p2	p2	3	1
189	IN	4	F	2	1	2	1	2	1	1	1	2	1	2	1	1	1	2	1	5	s	s	s	s	s	5	s	s	s	s	s	3	2	1	2	1	1	1	1	1	1	3	1
190	AZ	6	F	3	2	1	1	3	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	1,2	1	1	1	1	1	3	2	2	1	2	P1	P1	P1	P1	P1	99	1
191	CA	20	F	1	2	1	2	4	1	1	2	2	1	1	1	1	2	2	1	5	p1	p1	p2	p2	p1	4	1	1	2	2	1	2	2	1	1	1	1	1	2	2	1	1	1
192	CA	31	M	4	2	1	2	1	1	1	1	2	1	2	1	1	1	2	1	3	99	99	99	99	99	99	99	99	99	99	99	1	1	3	1	2	s	s	s	s	s	2	1
193	NY	33	M	3	2	2	2	2	1	1	2	2	1	2	1	1	2	2	1	5	p1	p2	p2	p2	p1	3	p2	p1	p3	99	p3	1	1	2	1	99	t1	t1	t2	t2	t1	3	1
194	CA	32	F	3	2	1	1	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	p1	p1	p1	p1	p1	2	1	3	1	2	s	s	s	s	s	3	1
195	OH	25	M	1,2	2	2	2	3	2	1	1	1	1	3	99	99	99	99	99	5	p1	p1	p1	p1	p1	5	p1	p1	p1	p1	1p	2	1	2	1	2	p1	p1	p1	p1	p1	3	2
196	MI	24	M	2	1	1	2	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	2	1
197	TX	26	M	1	2	1	1	1	1	1	1	2	1	1	1	1	1	2	1	3	1	1	1	1	1	2	1	1	1	1	1	3	2	1	1	1	1	1	1	1	1	3	1
198	MI	2	M	3	2	1	1	3	1	1	1	3	2	3	1	1	1	2	1	3	1	1	3	3	1	1	1	1	3	3	1	2	2	1	2	1	2	1	3	3	1	3	1
199	MA	22	F	1	2	1	1	3	1	1	1	1	1	3	1	1	1	1	1	1	99	1	99	99	99	99	1	99	1	99	99	99	1	1	2	1	2	p1	p1	p1	p1	1	1
200	OK	10	M	2	2	1	2	2	2	1	1	2	3	2	2	1	1	2	3	1	2	1	2	2	2	1	2	1	2	2	3	3	2	2	1	1	1	1	2	3	2	2	2
201	NE	30	99	1	2	1	2	2	1	1	2	2	2	2	1	1	2	2	2	1	1	1	2	3	2	5	s	s	s	s	s	1	2	1	1	1	1	1	1	1	1	1	1
202	NC	34	M	2	2	1	1	2	2	1	1	2	2	3	2	1	1	2	2	5	s	s	s	s	s	5	s	s	s	s	s	1	1	3	1	99	99	99	99	99	99	3	1
203	MN	1	F	3	2	2	1	2	2	1	1	1	1	2	2	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	3	3	1	2	1	3	1	1	1	1	2	1
204	IL	25	M	1	2	1	1	5	s	s	s	s	s	1	1	1	2	2	1	5	2	2	2	3	3	2	2	2	2	3	2	3	2	2	1	2	p2	p2	p2	p3	p2	3	1
205	CT	21	F	3	1	3	1	1	1	1	2	3	2	1	1	1	2	3	2	3	1	3	2	3	1	2	1	1	2	3	1	3	2	3	2	1	1	1	2	3	1	1	1
206	CT	24	F	3	1	3	1	2	1	1	1	3	1	3	1	99	99	99	99	1	99	1	99	99	99	1	99	1	99	99	99	3	2	2	2	1	1	1	99	99	99	3	1
207	AZ	31	M	1	2	1	2	5	s	s	s	s	s	5	s	s	s	s	s	5	p1	p1	p1	p1	p1	5	s	s	s	s	s	5	1	3	1	2	s	s	s	s	s	3	1
208	TX	26	M	1	2	2	1	2	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	s	s	s	s	s	2	1
209	TX	35	M	1	2	2	2	5	p2	p2	p2	p2	p2	5	s	s	s	s	s	5	p2	p2	p2	p2	p2	5	p2	p2	p2	p2	p2	5	1	3	1	2	p2	p2	p2	p2	p2	3	1
210	AL	1	M	3	2	2	2	1	1	1	2	1	1	3	1	1	2	1	1	2	1	1	1	1	1	3	99	99	99	99	99	1	99	99	99	99	99	99	99	99	99	3	1

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
211	WI	2	M	3	2	1	1	2	2	1	1	2	1	2	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	1	3	1	2	s	s	s	s	s	3	1
212	MT	31	M	2	2	1	2	2	1	1	1	3	2	3	1	1	1	3	3	3	1	1	1	3	3	1	1	1	1	3	3	1	2	2	1	2	p1	p1	p1	p3	p3	2	1
213	OH	8	M	3	2	1	2	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	1	1	1	2	s	s	s	s	s	2	1
214	TX	13	F	1	1	2	2	1	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	2	1	2	1	1	1	1	1	1	1	1
215	UT	2	M	99	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1	2	3	2	2	3	1	1	1	1	1	2	1	1
216	CA	24	M	1	2	1	1	1	1	99	99	99	99	1	1	1	99	99	99	2	99	99	99	99	1	2	99	99	99	99	1	2	1	3	1	2	s	s	s	s	s	2	1
217	CA	33	M	1	2	1	1	1	1	1	1	2	1	3	1	1	1	2	1	2	3	3	3	3	3	2	3	3	3	3	3	2	1	1	1	2	s	s	s	s	s	2	1
218	WI	20	M	4	2	1	1	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	1	3	1	2	s	s	s	s	s	3	1
219	CA	20	M	4	2	1	1	3	1	1	2	1	1	3	1	1	1	1	1	1	2	1	1	1	1	2	2	1	1	1	1	2	2	1	1	1	99	99	99	99	99	2	1
220	TX	3	M	1	2	2	1	2	2	1	2	2	1	2	1	2	2	2	1	3	99	1	99	1	99	1	99	1	99	1	99	3	2	2	2	1	p1	p2	p2	p2	p1	3	1
221	WA	13	F	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	1	1	2	1
222	TX	11	M	1	2	1	1	1,3	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2,3	2	2	2	1	1	1	1	1	1	1	2
223	HI	25	M	2	2	2	2	2	1	1	1	3	3	3	1	1	1	3	3	1	1	1	1	3	3	1	1	1	1	3	3	1	2	1	1	2	s	s	s	s	s	2	1
224	NC	8	M	2	2	1	1	2	1	1	1	2	2	2	1	1	1	2	2	5	p2	p2	p2	p2	p2	5	p2	p2	p2	p2	p2	3	2	1	1	1	2	2	2	2	2	2	1
225	CO	29	M	1	2	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	2	3	1	2	1	1	1	1	1	2	1
226	UT	15	M	1	2	1	1	2	2	1	1	3	1	2	2	1	1	3	1	3	2	3	3	3	1	3	2	3	3	3	1	1	2	1	1	1	2	1	1	3	1	2	1
227	MO	34	M	1	2	1	1	3	2	1	2	2	1	3	2	1	1	2	1	3	2	1	1	2	1	5	s	s	s	s	s	1	1	3	1	2	p4	p4	p4	p4	p4	3	1
228	CO	2	M	1	2	1	1	2	2	1	2	3	2	2	2	1	2	3	2	5	s	s	s	s	s	99	99	99	99	99	99	99	99	99	99	2	p2	p1	p2	p2	p2	3	2
229	TX	1	M	3	2	1	1	2	2	2	2	2	1	3	2	2	2	2	1	1	2	2	2	2	1	99	99	99	99	99	99	3	3	2	3	2	p2	p2	p2	p2	p1	2	1
230	TX	29	M	1	2	1	2	1	1	1	1	2	2	3	1	1	1	1	1	2	2	3	2	2	3	5	s	s	s	s	s	3	1	3	1	2	s	s	s	s	s	3	2
231	ID	35	M	2	1	2	2	99	1	1	1	1	1	3	1	1	1	1	1	2	99	99	99	99	99	1	99	99	99	99	99	1	3	2	1	2	p2	p1	p2	s	p1	2	1
232	HI	27	M	1	2	2	1	1	2	1	3	3	2	3	2	1	1	3	2	2	2	1	2	3	2	2	2	1	2	3	2	2	2	1	2	1	2	1	2	3	2	3	1
233	CO	7	F	1	1	2	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	s	s	s	s	s	2	2	2	1,2	1	1	1	1	1	1	1	1
234	SC	20	M	1	2	99	99	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	99	99	3	99	99	99	99	99	99	99	99	99
235	TX	24	M	1	1	1	2	99	99	99	99	99	99	99	99	99	99	99	99	99	t1	t1	t1	t3	t1	2	1	1	1	3	1	2	2	1	2	2	p1	p1	p1	s	p1	2	1
236	TX	6	F	3	2	1	1	5	s	s	s	s	s	5	s	s	s	s	s	99	p1	p1	p1	p1	p1	5	s	s	s	s	s	5	1	3	1	99	p1	p1	p1	p1	p1	3	1
237	NY	33	M	2	2	2	1	2	1	1	99	2	99		1	1	99	99	99	1	99	99	99	99	99	1	3	3	3	3	3	1	1	3	1	2	s	s	s	s	s	1	1
238	MN	53	M	99	2	99	2	1,3	1	1	1	2	1	3	1	1	1	2	1	5	s	s	s	s	s	5	s	s	s	s	s	3	1	1	1	2	p2	p2	p1	p1	p2	2	1
239	NY	23	M	1	2	1	2	2	2	1	2	1	2	2	2	2	2	1	3	3	2	1	2	1	2	3	2	1	1	1	2	2	2	2	1	2	s	s	s	s	s	3	1
240	NY	20	M	1	2	1	2	2	1	1	2	2	1	2	1	1	2	2	1	3	3	2	2	2	2	1	2	2	2	2	2	1,3	2	2	2	1	p1	p1	p2	p2	p1	3	1

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
241	MO	37	M	1	2	1	1	1	1	1	1	2	1	2	1	1	1	2	1	5	p2	p2	p2	p2	p2	3	2	2	2	2	2	2	2	2	1	2	s	s	s	s	s	1	1
242	MI	20	M	1	2	1	1	1	1	1	1	3	1	1	1	1	1	3	1	3	1	1	1	3	1	3	1	1	1	3	1	2	1	3	1	2	1	1	1	3	1	3	1
243	TX	8	M	1	1	3	1	2,3	3	1	2	3	2	2,3	3	1	2	3	2	1	3	1	2	3	2	1	3	1	2	3	2	2	2	1	2	1	3	1	2	2	3	1	1
244	TX	20	M	3	2	1	1	3	2	1	1	3	1	3	2	1	1	3	1	1	1	1	99	3	2	1	1	1	2	3	2	1	2	3	2	1	1	1	2	3	1	3	1
245	TX	34	M	1	2	1	1	1,2,	1	1	1	3	1	3	1	1	1	4	1	2	1	2	2	4	2	2	3	3	3	3	3	1,3	2	2	1	2	p1	p1	p1	p1	p1	3	1
246	HI	23	F	1	1	1	1	2	2	1	2	2	2	2	2	1	2	2	2	5	s	s	s	s	s	5	s	s	s	s	s	2	2	2	2	1	2	1	2	2	2	3	1
247	VA	32	M	1	2	1	2	2	2	1	1	2	1	3	1	1	1	2	1	3	2	2	3	3	3	2	2	1	2	2	1	1	2	2	1	2	s	s	s	s	s	2	1
248	CA	19	M	1	2	1	2	5	s	s	s	s	s	3	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	99	1	3	1	99	99	99	99	99	99	3	1
249	CA	25	M	1	1	1	1	3	1	1	1	1	1	2	1	1	1	1	1	99	t1	t1	t1	t1	t1	99	99	99	99	99	99	1	2	1	2	1	99	99	99	99	99	2	1
250	KS	33	M	1	1	2	2	1	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1	3	1	2	1	1	1	3	1	2	2	2	2	1	1	1	1	1	1	3	1
251	NH	23	M	1	2	2	2	2	1	1	2	2	1	2	1	1	2	2	1	3	1	3	3	2	1	3	1	3	3	2	1	1	1	3	1	99	99	99	99	99	99	3	1
252	NY	30	M	1	2	1	1	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	1	2	1	1	2	s	s	s	s	s	3	1
253	CA	35	M	1	2	1	2	5	s	s	s	s	s	5	s	s	s	s	s	5	p1	p1	p1	p2	p1	5	s	s	s	s	s	5	2	2	1	2	s	s	s	s	s	3	1
254	TX	30	M	1	1	2	1	1	2	1	1	2	2	2	2	1	1	2	2	3	2	2	1	2	2	2	2	1	1	2	2	1	2	1	2	1	1	1	1	2	2	3	1
255	HI	10	F	2	99	1	1	2	1	1	1	2	2	3	1	1	1	2	1	5	s	s	s	s	s	1	1	1	1	2	1	99	2	1	1	2	p1	p1	p1	p1	p1	3	1
256	HI	10	M	2	2	1	1	3	2	1	2	3	1	3	2	3	3	3	1	2	3	1	2	3	1	5	s	s	s	s	s	2	2	1	1	2	s	s	s	s	s	3	1
257	AL	10	M	1	1	1	1	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
258	MA	34	M	1	2	1	1	3	1	1	1	2	1	3	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	99	1	99	1	1	1	1	1	2	1	2	1
259	CA	29	M	1	2	1	2	1	2	1	2	3	1	3	1	1	2	2	1	3	2	1	1	2	1	5	s	s	s	s	s	3	1	3	1	99	t2	t1	t1	t3	t1	3	1
260	TX	8	M	1	1	1	1	2	1	1	1	3	1	3	1	1	1	3	1	3	1	1	1	3	1	1	1	1	1	3	1	1	2	2	2	2	p1	p1	p1	p3	p1	3	1
261	IL	23	M	1	1	1	1	1	1	1	1	3	1	1	1	1	1	3	1	3	1	1	1	3	1	3	1	1	1	3	1	2	2	1	2	2	s	s	s	s	s	3	1
262	CA	30	M	1	2	2	1	2	1	1	1	1	1	3	1	1	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1
263	NJ	15	M	1	2	1	1	1	1	1	1	3	1	3	1	1	1	3	1	3	1	1	1	3	1	2	1	1	1	3	1	3	1	3	1	99	99	99	99	99	99	2	1
264	OK	6	M	1	1	1	1	1	1	1	2	3	1	3	2	1	2	2	1	2	1	3	3	3	1	2	1	3	3	3	1	3	3	1	2	1	1	1	2	3	1	3	1
265	TX	3	M	3	2	1	2	1	1	1	1	1	1	2	1	1	1	1	1	5	p4	p4	p4	p4	p4	3	4	4	4	4	4	3	2	2	2	1	1	1	1	1	1	3	1
266	GA	35	M	1	2	1	2	1	1	1	1	2	1	3	2	2	1	1	2	3	2	2	2	1	1	1	1	99	1	1	1	1	1	3	1	2	s	s	s	s	s	2	1
267	NC	23	M	3	2	2	1	3	1	1	2	2	2	3	1	1	2	2	1	5	s	s	s	s	s	5	s	s	s	s	s	2	1	3	1	2	s	s	s	s	s	2	1
268	CA	15	F	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	2	p1	p1	p1	p1	p1	3	1
269	TX	10	M	1	2	1	1	3	2	1	1	2	2	3	2	1	1	2	2	1	2	1	2	2	2	2	2	1	1	2	99	3	2	1	2	2	2	1	1	2	2	2	1
270	NJ	20	M	1	2	1	1	2	2	1	1	2	1	3	1	1	1	2	1	5	s	s	s	s	s	5	s	s	s	s	s	1	2	1	1	2	p2	p1	p1	p2	p1	3	1

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
271	OR	22	M	1	2	1	1	3	1	1	1	2	1	3	2	2	1	2	1	3	99	99	99	1,3	1	1	99	1	99	3	99	1	1	3	1	2	s	s	s	s	s	3	1
272	CA	40	M	4	2	2	2	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
273	MI	32	M	1	2	2	2	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	1,5	1	3	1	2	s	s	s	s	s	2	1
274	MN	6	F	2	2	1	1	1	1	1	2	2	1	3	2	1	1	2	1	5	p2	p1	p1	p2	p1	5	p1	p1	p1	p2	p1	3	3	1,2	2	2	p4	p4	p4	p4	p4	3	1
275	NV	33	M	2	1	1	1	2	1	1	1	2	1	3	1	1	2	2	2	4	2	1	2	2	1	1	2	1	2	3	2	2	2	1	2	1	2	1	2	2	1	2	1
276	OR	17	F	1	2	1	1	3	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	2	1	1	2	s	s	s	s	s	2	1
277	MI	23	F	1	2	1	1	1,3	1	1	3	3	1	3	2	1	3	3	1	5	p1	p1	p3	p3	p1	5	p1	p1	p3	p3	p1	3	1	1	2	2	p1	p1	p3	p3	p1	3	1
278	NV	3	F	3	2	1	1	1	1	1	1	1	1	3	1	1	1	1	1	2	2	3	1	1	3	2	2	3	1	1	3	2	2	3	1	2	s	s	s	s	s	3	2
279	IA	26	M	1	2	2	1	1	1	1	2	2	2	3	1	1	2	2	2	2	1	1	2	2	2	2	1	1	2	2	2	1	2	1	1	99	99	99	99	99	99	3	1
280	MD	11	M	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	3	1	2	s	s	s	s	s	2	1
281	TX	3	M	1	2	1	1	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	1	3	1	2	s	s	s	s	s	3	1
282	OH	28	M	2	2	1	2	5	s	s	s	s	s	3	1	1	2	2	1	2	1	1	2	2	1	2	1	1	2	2	1	2	2	1	1	1	1	1	2	2	1	2	1
283	TX	2	M	1	1	2	1	4	1	1	2	1	1	4	1	1	2	1	1	5	p1	p1	p2	p1	p1	5	p1	p1	p2	p1	p1	3	2	2	1,2	1	1	1	2	1	1	3	1
284	MN	31	M	1	2	99	99	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	99	99	99	99	99	99	99	99	99	99	99	99
285	OK	28	M	1	1	1	1	2	2	1	2	2	2	3	2	3	2	3	2	3	4	4	4	4	4	5	s	s	s	s	s	2	2	2	2	2	p3	p1	p2	p3	p2	2	1
286	IL	25	F	1	2	2	2	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	1	3	1	99	99	99	99	99	99	2	1
287	ND	35	M	2	2	1	1	3	2	1	1	1	1	3	2	1	1	1	1	5	p2	p1	p1	p1	p1	5	p2	p1	p1	p1	p1	2	1	3	1	99	99	99	99	99	99	3	2
288	AZ	32	M	1	2	2	1	1	1	1	2	1	1	1	1	1	2	2	1	3	1	1	2	2	1	3	1	1	2	1	1	2,3	2	1	2	2	p1	p1	p2	p1	p1	3	1
289	TX	46	M	3	2	2	2	1	1	1	1	1	1	3	1	1	1	1	1	3	4	4	4	4	4	2	99	99	99	99	99	1	1	3	1	2	s	s	s	s	s	2	1
290	TX	22	M	3	2	2	1	1	1	1	1	1	1	3	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	p1	p1	p1	p1	p1	2	1
291	CA	36	M	1	2	2	2	1	2	1	1	1	2	3	1	1	2	1	1	3	2	2	2	2	2	2	99	99	99	99	99	2	2	1	2	2	s	s	s	s	s	2	1
292	TX	5	M	2	2	1	2	2	2	1	3	3	1	3	1	1	2	3	1	1	2	3	1	1	3	1	1	1	2	1	1	1	2	1	2	2	s	s	s	s	s	99	1
293	GA	27	F	4	2	2	2	5	p1	p1	p1	p1	p1	5	p1	p1	p1	p1	p1	5	s	s	s	s	s	5	s	s	s	s	s	3	1	3	1	99	99	99	99	99	99	2	1
294	MS	24	M	1	2	2	2	2	1	1	1	2	2	1	1	1	1	2	2	3	1	1	1	2	2	3	1	1	1	2	2	1	1	3	1	99	99	99	99	99	99	2	1
295	MD	30	M	3	2	1	1	5	s	s	s	s	s	5	p1	p1	p1	p2	p1	5	p1	p1	p1	p2	p1	5	p1	p1	p1	p2	p1	5	1	3	1	2	s	s	s	s	s	3	1
296	NE	44	M	1	2	1	1	99	99	99	99	99	99	99	99	99	99	99	99	99	t1	t1	t1	t1	t1	5	s	s	s	1	s	2	2	3	2	2	s	s	s	s	s	3	1
297	CA	25	M	3	2	2	2	2	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
298	AZ	3	M	2	2	2	1	2	1	1	2	2	1	2	1	1	2	2	1	3	2	2	2	2	2	3	2	2	2	2	2	1	2	2	2	2	p1	p1	p2	p2	p1	3	1
299	CO	3	M	1	2	1	1	1	1	1	2	2	1	3	1	1	2	2	1	2	1	1	2	2	1	5	s	s	s	s	s	2	2	1	2	2	s	s	s	s	s	3	1
300	TX	30	M	99	2	2	2	2	3	1	1	3	2	3	1	1	3	3	2	1	3	1	1	3	2	1	2	1	2	3	2	1	2	3	2	1	1	1	1	3	2	3	2

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
301	TX	22	M	3	2	1	1	2	1	1	1	2	2	3	2	3	3	3	2	3	1	1	1	1	1	1	2	1	2	2	2	1	2	3	1	2	s	s	s	s	s	3	1
302	TX	27	M	3	2	1	2	1	1	1	1	2	1	3	1	1	1	1	1	3	99	99	99	99	99	5	s	s	s	s	s	1	2	3	2	99	99	99	99	99	99	99	99
303	TX	20	M	1	2	2	1	5	s	s	s	s	s	5	s	s	s	s	s	3	1	1	1	1	1	3	1	1	1	1	1	3	2	2	1	2	s	s	s	s	s	2	1
304	VA	21	M	3	2	2	2	5	s	s	s	s	s	99	t2	t2	t2	t2	t2	5	s	s	s	s	s	5	s	s	s	s	s	5	1	2	1	99	99	99	99	99	99	2	1
305	NY	26	M	1	2	1	1	2	2	1	1	3	2	2	2	1	1	3	2	3	2	2	2	2	1	3	2	2	2	2	1	3	2	2	2	1	2	1	1	3	1	1	1
306	HI	23	M	1	2	1	1	1	1	1	1	1	1	3	1	1	1	1	2	3	1	1	1	1	2	1	1	1	1	1	2	1	2	1	2	2	s	s	s	s	s	2	1
307	OK	14	M	3	2	1	2	2	2	1	1	2	1	3	2	1	1	2	2	5	p2	p1	p1	p2	p1	1	2	1	1	2	1	1	2	2	1	2	p2	p1	p1	p1	p1	2	1
308	TX	20	M	1	2	1	1	2	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	4	4	4	4	4	1	1	1	1	2	s	s	s	s	s	3	1
309	TX	27	M	1	1	1	1	1	1	1	2	2	2	3	2	1	1	2	2	3	1	99	99	2	99	2	1	1	2	2	3	3	2	2	2	1	1	1	1	1	1	3	1
310	MD	8	F	1	2	2	2	1,2	1	1	1	2	2	3	1	1	1	2	2	5	s	s	s	p2	s	5	s	s	s	p2	s	2	2	1	1	1	1	1	1	1	1	3	1
311	TX	24	M	1	2	2	2	1	99	99	99	99	99	2	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	5	1	1	1	99	99	99	99	99	99	99	99
312	CA	30	99	1	2	2	1	1	1	1	1	2	1	1	1	1	1	2	1	5	p1	p1	p1	p1	p1	5	p1	p1	p1	p1	p1	1	1	3	1	1	1	1	1	1	1	2	1
313	VA	34	M	1	2	1	1	3	2	1	2	2	1	3	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	2	s	s	s	s	s	2	2
314	TX	12	M	1	2	2	1	2	1	1	1	2	1	3	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	3	2	1	1	2	p1	p1	p1	p2	p1	2	2
315	CA	38	M	1	2	1	1	2	99	1	99	99	99	3	99	1	99	99	99	2	99	1	99	99	99	1	99	99	1	99	99	1	1	2	1	99	99	99	99	99	99	99	99
316	AL	27	M	1	2	2	1	5	p1	p1	p1	p2	p1	5	p1	p1	p1	p2	p1	5	s	s	s	s	s	5	s	s	s	s	s	3	2	2	1	2	p1	p1	p1	p2	p1	3	2
317	WA	25	M	3	2	1	1	3	1	1	2	2	1	3	1	1	2	2	1	1	1	1	2	2	2	1	1	1	2	2	1	1	2	3	2	1	1	2	2	2	2	3	1
318	MI	41	M	1	2	1	2	1	2	2	2	1	99	3	2	2	2	1	99	2	2	2	2	1	99	2	3	3	3	1	99	1	1	3	1	99	t2	t1	t2	t2	t1	2	1
319	TX	3	M	3	2	2	2	2	2	1	1	2	2	3	2	1	1	2	2	5	p2	p1	p1	p2	p2	5	p2	p1	p1	p2	p2	3	99	99	2	1	2	1	1	2	2	1	1
320	SD	32	M	1	2	2	1	3	99	1	1	99	99	3	99	1	99	99	99	4	99	99	99	99	1	4	2	4	1	99	1	1	1	3	1	2	s	s	s	s	s	2	1
321	MS	48	M	1	2	1	1	5	p1	p1	p1	p1	p1	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	2	1	1	2	s	s	s	s	s	2	1
322	NM	28	M	1	2	2	1	1	1	1	2	2	1	3	1	1	1	2	2	5	s	s	s	s	s	5	s	s	s	s	s	3	1	2	1	99	99	99	99	99	99	2	2
323	IL	16	M	1	2	1	1	2,3	1	1	1	2	1	2,3	1	1	1	2	1	5	s	s	s	s	s	5	s	s	s	s	s	3	1	3	1	1	99	99	99	99	99	2	1
324	LA	22	F	1	2	1	2	3	1	1	1	1	1	3	1	1	1	1	1	1	4	4	4	4	4	1	4	4	4	4	4	3	1	3	1	2	s	s	s	s	s	3	1
325	GA	48	M	1	2	2	2	2	1	1	1	1	2	2	1	1	1	1	2	5	p2	p1	p1	p1	p2	5	p2	p2	p2	p2	p1	5	2	1	1	2	p1	p1	p1	p1	p2	2	1
326	MA	23	F	3	2	1	1	2	2	1	1	1	1	3	2	1	1	1	1	3	1	1	1	1	1	5	s	s	s	s	s	4	1	3	1	99	99	99	99	99	99	2	2
327	MI	22	M	1	2	1	1	1	1	1	2	2	2	1	1	1	2	2	2	5	s	s	s	s	s	5	s	s	s	s	s	2	2	1	1	2	s	s	s	s	s	3	1
328	NY	30	M	2	1	2	2	2	2	1	1	3	1	2	2	1	1	3	1	5	s	s	s	s	s	5	s	s	s	s	s	1	2	1	2	1	2	1	1	3	1	2	1
329	WA	22	M	1	1	1	1	1	1	1	2	3	1	3	1	1	2	3	1	3	1	1	2	3	1	2	1	1	2	3	1	2	2	1	2	2	s	s	s	s	s	3	1
330	CA	13	M	3	2	2	1	1	1	1	2	2	1	3	1	1	1	2	2	2	1	2	2	3	2	2	1	2	2	3	2	2	2	2	2	2	s	s	s	s	s	3	1

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
331	NC	35	M	1	2	2	2	3	1	1	99	3	1	3	1	1	99	3	1	2	99	1	99	3	1	2	1	1	99		3	1	1,2	1	3	1	99	99	99	99	99	2	2
332	MI	34	M	1	2	1	2	3	1	1	1	1	1	3	1	1	1	1	1	1	4	4	4	4	4	1	4	4	4	4	4	1	1	3	1	2	s	s	s	s	s	99	1
333	HI	22	M	1	1	2	2	2	1	1	2	2	1	3	1	1	2	2	1	5	s	s	s	s	s	1	99	99	99	99	99	5	2	1	1	2	s	s	s	s	s	3	1
334	WV	30	M	3	2	1	1	2	1	1	1	1	1	2	1	1	1	1	1	3	99	99	99	1	1	3	99	99	99	99	1	3	2	1	1	1	99	99	99	99	1	2	1
335	WI	41	M	3	2	1	1	4	99	99	99	99	99	2,3	1	1	1	2	1	5	s	s	s	s	s	5	s	s	s	s	s	3	2	1	1	2	p1	p1	p1	p2	p1	2	2
336	IN	11	F	1	2	2	1	3	2	1	1	2	1	3	2	1	1	2	1	4	99	99	99	99	99	4	99	99	99	99	99	3	2	1	2	1	1	1	1	2	1	1	2
337	MN	20	M	2	2	1	1	2	1	1	1	3	1	2	1	1	1	3	1	3	2	3	3	3	2	5	s	s	s	s	s	3	1	3	1	2	p1	p1	p1	p3	p1	2	2
338	KY	42	M	4	2	1	2	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	2	3	1	2	p1	p2	p2	p3	p1	2	1
339	WA	22	M	1	2	1	1	1,4	2	1	1	2	2	3	1	1	2	2	2	5	p2	s	s	s	s	2	2	99	99	99	99	2	2	2	1	2	s	s	s	s	s	2	2
340	MD	14	M	2	1	1	1	2	2	1	1	2	1	2	2	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2	1	3	2	2	1	1	2	1	1	2	1	2	1
341	TX	1	M	3	2	2	1	5	s	s	s	s	s	5	s	s	s	s	s	3	99	99	99	99	99	3	99	99	99	99	99	5	1	3	1	99	99	99	99	99	99	3	1
342	IL	20	M	1	1	1	1	2	2	1	1	1	3	3	1	1	1	1	2	5	s	s	s	s	s	1	3	1	1	1	3	2	2	1	2	1	2	1	1	1	2	2	1
343	FL	40	M	4	2	3	1	4	2	1	1	2	2	3	1	1	2	3	99	2	2	1	2	2	2	1	2	1	2	3	2	1	2	1	1	2	s	s	s	s	s	3	2
344	WA	18	F	1	2	1	1	1	1	1	1	1	3	3	1	1	1	1	3	2	1	1	1	3	1	2	1	1	1	3	1	2	2	2	1	1	1	1	1	3	2	3	1
345	MO	50	M	1	2	1	2	1	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1	1	1	3	1	1	1	1	1	3	2	2	1	1	1	1	1	1	1	3	1
346	MO	30	M	1	2	2	1	1	1	1	2	2	3	3	1	1	1	2	1	5	s	s	s	s	s	5	s	s	s	s	s	5	2	1	1	2	s	s	s	s	s	2	1
347	AZ	24	M	1	1	1	1	2	1	1	1	2	1	3	1	1	1	2	1	4	1	1	1	2	1	4	1	1	1	2	1	1	3	1	2	1	1	1	1	2	1	3	1
348	TX	1	M	3	2	2	2	1	1	1	1	2	1	3	1	1	1	2	1	3	1	1	2	2	1	5	p1	p1	p2	p2	p1	3	3	1	2	1	1	1	2	2	1	3	1
349	PA	31	M	1	2	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	2	2	1	2	2	1	2	2	1	2	2	1	1	1	1	2	p1	p1	p1	p1	p1	3	1
350	TX	1	F	3	2	1	1	1	1	1	2	3	1	3	1	1	1	3	2	5	s	s	s	s	s	5	s	s	s	s	s	1	1	3	1	99	99	99	99	99	99	3	2
351	TX	21	M	1	1	1	1	1	1	2	2	2	2	3	2	3	2	2	2	3	3	2	2	3	2	99	99	99	99	99	99	1	1	1	2	99	99	99	99	99	99	99	99
352	VA	24	M	4	2	1	2	1	1	1	1	2	1	3	1	1	1	2	1	2	3	3	3	3	3	3	3	3	3	3	3	2	2	2	1	99	t1	t1	t1	t1	t1	3	1
353	NY	2	M	4	2	1	1	1	2	1	1	2	1	2	1	1	1	2	1	3	1	2	1	1	1	5	s	s	s	s	s	2	2	2	1	2	s	s	s	s	s	3	1
354	PA	19	M	3	2	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	3	3	2	p1	p1	p1	p1	p1	2	1
355	OH	13	M	1	1	1	1	2	1	1	1	1	1	3	1	1	1	1	1	3	1	99	99	99	1	1	1	99	1	1	99	1,2	3	1	2	1	1	1	1	1	1	2	1
356	NY	25	F	1	2	1	1	1	1	1	1	2	1	1	1	1	1	2	1	5	p1	p1	p1	p2	p1	5	s	s	s	s	s	3	2	1	1	2	p1	p1	p1	p2	p1	3	1
357	CA	51	M	1	2	1	1	1	1	1	2	2	1	3	1	2	2	2	1	2	1	1	1	3	1	2	1	1	1	2	1	1	1	3	1	99	99	99	99	99	99	3	1
358	IL	26	F	1	2	1	1	2	2	1	1	2	1	3	1	1	1	1	2	5	s	s	p1	s	s	1	p1	p1	s	s	s	1	2	1	1	1	99	1	1	99	99	2	1
359	WI	31	M	2	2	1	1	1	1	1	2	2	1	3	2	1	1	2	1	2	99	99	99	99	99	2	99	99	99	99	99	3	2	1	1	1	1	1	1	1	1	3	1
360	LA	12	M	1	2	1	1	1	1	1	2	3	2	3	1	1	1	3	1	3	3	2,3	2	2	1	2	2	2	2	2	1	1	2	1	2	2	s	s	s	s	s	3	1

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
361	TX	27	M	1	1	1	1	1,2	1	1	2	2	2	3	1	1	1	3	2	5	p1	p1	p1	p2	p2	5	p1	p1	p1,2	2	2	3	1	1	2	99	t1	t1	t1	t2	t2	3	1
362	TX	25	M	4	2	3	2	3	1	1	1	1	1	3	1	1	1	1	1	2	3	3	3	3	3	2	4	4	4	4	4	5	1	3	1	2	s	s	s	s	s	2	1
363	TX	3	F	1	1	2	2	1	1	1	2	3	1	2	1	1	2	3	1	3	4	4	4	4	4	5	s	s	s	s	s	2	2	1	2	1	1	1	2	3	1	3	1
364	CT	18	F	3	2	1	1	5	p1	p1	p1	p1	p1	3	1	1	1	1	1	5	p1	p1	p1	p1	p1	5	p4	p4	p4	p4	p4	5	1	3	1	2	s	s	s	s	s	2	2
365	AK	30	M	1	1	1	2	2	1	1	1	2	1	3	1	1	1	2	1	5	p1	p1	p1	p2	p2	5	p1	p1	p1	p2	p1	1	2	2	1	2	s	s	s	s	s	3	1
366	CT	30	M	1	2	1	1	1	2	1	1	3	2	3	2	1	1	3	2	3	99	99	99	99	99	2	99	99	99	99	99	2	2	2	1	1	2	1	2	3	2	3	1
367	TX	1	M	1	2	1	1	3	1	1	1	2	1	3	1	1	1	2	1	5	s	s	s	s	s	5	s	s	s	s	s	5	2	1	2	2	p1	p1	p1	p2	p1	3	1
368	TX	30	M	1	2	2	1	1	1	2	2	2	2	3	1	2	2	2	2	5	s	s	s	s	s	5	s	s	s	s	s	3	2	2	1	2	p1	p2	p2	p2	p2	2	1
369	FL	2	M	1	2	2	2	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	3	2	2	1	2	s	s	s	s	s	1	1
370	TX	25	M	1	1	3	2	1	2	1	2	2	1	3	2	1	2	2	1	5	p2	p2	p2	p2	p2	5	p1	p1	p2	p1	p1	3	2	1	1	2	p1	p2	p1	p2	p1	2	1
371	WI	30	M	2	2	1	1	2	1	1	1	3	2	3	2	3	3	3	2	1	3	2	3	3	2	1	2	1	1	3	2	1	2	1	1	1	1	1	3	2	2	3	1
372	ME	25	M	1	2	1	2	2	2	1	2	3	2	2	2	1	2	3	2	3	2	1	2	3	2	3	2	1	2	3	2	1	2	3	1	99	99	99	99	99	99	3	1
373	TX	14	F	1	1	2	1	2	1	1	1	3	1	2	1	1	2	3	2	1	1	1	2	2	2	1	2	1	2	3	2	1	2	1	2	1	2	1	1	2	2	3	1
374	CA	1	M	3	2	2	2	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	1	3	1	2	s	s	s	s	s	2	1
375	CA	1	F	3	2	1	1	1	2	1	2	2	2	1	3	1	3	3	1	2	3	1	2	2	2	2	2	2	2	2	2	1	1	2	2	2	p2	p2	p2	p2	p2	2	2
376	OH	39	M	2	2	1	2	1	1	1	1	1	1	3	1	1	1	1	1	2	3	3	3	3	3	2	3	3	3	3	3	1	1	3	1	2	s	s	s	s	s	2	1
377	CO	45	M	1	2	1	2	3	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	p1	p1	p1	p1	p1	2	1
378	IL	36	M	2	2	1	2	3	1	1	2	2	1	3	1	1	2	2	1	1	1	1	2	2	1	1	1	1	2	2	1	1	2	1	1	1	1	1	2	2	1	3	1
379	TX	34	M	1	2	1	1	3	1	1	1	1	1	3	1	99	99	1	99	1	1	99	99	1	99	1	99	99	1	99	1	1	1	1	1	99	99	99	99	99	99	3	99
380	NC	30	M	1	2	2	2	1	1	99	99	99	99	1	1	99	99	99	99	1	1	99	99	99	99	2	2	1	1	1	1	1	2	1	3	1	1	2	1	1	1	2	1
381	FL	30	M	1	2	1	1	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	s	s	s	s	s	5	1	99	1	99	99	99	99	99	99	2	1
382	OH	32	M	1	2	1	1	3	1	1	1	3	1	3	1	1	1	3	1	1	99	99	99	99	99	1	99	99	99	99	99	2	2	1	2	1	1	1	1	3	1	2	2
383	TX	16	M	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	3	4	4	4	4	4	3	4	4	4	4	4	1	2	2	2	1	1	1	2	3	3	2	1
384	TX	29	M	1	2	1	1	2	1	1	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	99	99	99	99	99	99	99	99
385	IA	22	M	1	2	2	1	2	1	1	2	2	3	3	1	1,2	2	3	2	3	2	2	1	1	3	5	s	s	s	s	s	1	2	1	1	2	s	s	s	s	s	3	1
386	CA	29	M	1	1	1	1	99	1	1	1	1	1	3	1	1	1	1	1	5	s	s	s	s	s	1	1	1	1	3	1	1	2	1	2	2	s	s	s	s	s	3	1
387	MN	35	M	1	2	2	2	2	1	1	1	1	1	2	1	1	1	1	1	3	99	99	99	99	1	3	99	99	99	99	1	3	2	2	1	1	1	1	1	1	1	2	1
388	NC	44	M	1	1	2	1	1	1	1	2	2	1	3	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	p1	p1	p1	p1	p1	2	1
389	TX	15	F	1	2	1	1	99	99	99	99	99	99	99	99	99	99	99	99	99	t2	t1	t2	t2	t1	2	1	1	2	2	2	3	2	1	1,2	99	99	99	99	99	99	99	99
390	NC	23	M	1	2	2	1	2	1	1	1	1	1	3	1	1	1	1	1	5	p1	p2	p2	p1	p2	1	1	1	2	1	1	3	2	1	1	2	p4	p4	p4	p4	p4	2	1

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
391	TX	30	M	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	3	1	1	1	1	1	1	1	1	1
392	CA	15	M	1	2	1	1	4	2	1	1	3	1	4	2	1	1	3	1	3	2	3	3	1	3	3	2	3	3	1	3	3	3	1	1	99	99	99	99	99	99	3	1
393	FL	51	M	4	2	99	1	1	99	99	99	1	99	5	s	s	s	p1	s	5	s	s	s	p1	s	99	99	99	99	t1	99	1	2	1	1	1	99	99	99	1	99	2	1
394	MD	1	F	4	2	2	2	2	2	1	1	2	1	3	2	1	1	2	1	1	2	2	2	2	2	5	s	s	s	s	s	3	2	2	1	2	p1	p1	p1	p2	p1	3	1
395	OH	33	M	2	2	2	2	2	2	1	1	2	2	5	p2	p2	p2	p2	p2	3	2	2	2	2	2	1	2	2	2	2	2	1	2	2	1	99	t2	t2	t2	t2	t2	2	2
396	TX	16	M	1	2	2	2	1	1	1	2	3	1	1	1	1	2	3	1	2	1	1	2	3	1	2	1	1	2	3	1	3	2	1	2	1	1	1	2	3	1	3	1
397	TX	4	F	1	1	2	1	1	1	1	1	1	1	3	1	1	1	1	1	3	2	2	2	1	2	2	2	2	2	2	2	3	2	3	2	2	s	s	s	s	s	2	1
398	MO	10	F	3	2	1	1	1	1	1	1	1	1	4	1	1	1	1	1	5	s	s	s	s	s	99	99	99	99	99	99	5	2	2	3	2	s	s	s	s	s	1	1
399	PR	18	F	4	2	1	1	3	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	1	1	2	s	s	s	s	s	2	2
400	TX	35	M	1	1	2	2	1,2	2	1	1	3	2	3	1	1	1	1	1	3	3	3	3	1	3	1	3	3	3	1	3	2	2	1	1,2	1	2	1	1	3	1	3	1
401	TX	27	M	1	2	1	1	1	1	1	2	3	2	3	1	1	2	3	2	2	1	1	3	3	2	2	1	1	3	3	2	3	2	1	2	1	1	1	2	3	2	1	1
402	TX	15	F	3	2	1	1	1	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	5	1	1	1	2	s	s	s	s	s	3	1
403	OK	31	M	1	1	1	1	2	2	1	1	2	1	3	1	1	1	2	1	5	s	s	s	s	s	5	s	s	s	s	s	1	2	2	2	2	s	s	s	s	s	3	1
404	TN	21	M	2	2	1	2	2	2	1	1	2	1	3	2	1	1	2	1	3	99	99	99	99	99	1	99	99	99	99	99	5	2	1	1	2	1	1	1	1	1	2	1
405	MD	18	F	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	3	1	1	1	2	1	3	1	1	1	2	1	2	2	2	2	1	1	1	1	2	1	3	1
406	NH	20	M	3	2	1	2	2	1	1	1	2	1	1	1	1	1	2	1	3	1	1	1	2	1	3	1	1	1	2	1	2	1	3	1	99	99	99	99	99	99	2	1
407	SD	2	M	1,3	99	1	2	1,2,	1	1	2	1	2	3	1	1	1	1	99	5	p1	p1	p1	p1	p2	5	p1	p1	p1	p1	p1	3	2	1	2	1	1	2	2	1	2	3	1
408	WI	32	M	3,4	2	1	2	1	99	1	1	2	1	3	1	2	1	2	2	3	99	99	99	99	1	5	s	s	s	s	s	2	1	3	1	99	99	99	99	99	99	3	1
409	PR	18	M	1	2	1	1	1	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1	1	1	3	1	1	1	1	1	2	2	2	1	2	p1	p1	p1	p1	p1	1	1
410	TX	20	M	1	2	1	1	2	1	1	2	2	1	3	1	1	2	2	1	5	p2	p2	p2	p2	p2	5	s	s	s	s	s	3	2	1	1	2	s	s	s	s	s	3	1
411	TX	19	F	1	2	1	1	2	1	1	1	3	1	2	1	1	1	3	1	5	s	s	s	s	s	5	s	s	s	s	s	1	1	3	1	2	s	s	s	s	s	3	1
412	TX	28	M	1	1	2	1	2,3	1	1	1	1	1	3	2	1	1	3	2	5	s	s	s	s	s	4	99	99	99	99	99	2	2	1	2	2	s	s	s	s	s	2	1
413	TN	28	M	2	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	3	1	1	1	1	1	3	1	1	1	1	1	1,3	3	1	2	99	99	99	99	99	99	3	1
414	TN	28	F	2	2	1	1	2	2	1	2	2	2	2	2	1	2	2	2	1	2	1	2	2	2	1	2	1	2	2	2	1	1	3	1	2	s	s	s	s	s	2	1
415	VA	31	M	1	2	1	1	99	99	99	99	99	99	99	99	99	99	99	99	99	t1	t1	t3	t3	t1	5	s	s	s	s	s	3	1	3	1	99	99	99	99	99	99	2	1
416	TX	20	M	1	2	2	2	5	s	s	s	s	s	5	s	s	s	s	s	5	p2	p1	p2	p2	p1	5	s	s	s	s	s	1	1	3	1	2	s	s	s	s	s	2	1

Raw Data (continued)

	Location	yrs	gen	pract	orthotrt	initwear	latwear	maxbest	dur8	comp8	con8	cost8	hyg8	mandbest	dur9	comp9	con9	cost9	hyg9	maxwors	dur10	comp10	con10	cost10	hyg10	mandwors	dur11	comp11	con11	cost11	hyg11	brok	rep	fee	newret	diff	dur17	comp17	con17	cost17	hyg17	resp	bring
417	NM	6	F	1	1	1	1	4	1	1	1	2	1	4	1	1	1	2	1	4	4	4	4	4	4	4	4	4	4	4	4	3	2	2	2	1	2	1	2	3	1	3	1
418	TX	7	99	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	3	2	2	2	2	1	3	2	2	2	2	1	1	2	1	2	1	2	2	2	2	1	3	1
419	PA	33	M	1	2	1	2	1	1	1	1	1	1	3	1	1	1	1	1	5	s	s	s	s	s	2	1	99	99	99	99	5	1	2	1	2	s	s	s	s	s	3	1
420	CA	35	M	1	1	1	2	1	1	1	1	2	1	3	1	3	3	3	1	3	1	1	1	2	1	2	1	1	1	2	1	2	2	2	2	2	s	s	s	s	s	2	1
421	KY	21	M	1	2	2	2	1	1	1	2	2	1	3	1	1	1	2	2	3	2	1	2	3	3	1	2	1	2	3	3	2	2	2	1	1	2	1	1	1	1	3	1
422	MN	21	M	1	2	1	1	2	2	1	2	1	1	2	2	1	2	1	1	3	2	1	2	1	1	1	2	2	2	2	2	3	1	1,3	1	2	s	s	s	s	s	3	2
423	OR	3	M	3	2	2	2	2	1	1	1	1	1	3	1	1	1	1	1	5	s	s	s	s	s	5	s	s	s	s	s	3	2	2	1	2	s	s	s	s	s	2	2
424	NC	30	99	1	1	2	1	1	99	1	99	99	99	2	99	1	99	99	99	1	99	99	1	99	99	3	99	99	2	99	99	2	2	2	1	2	s	s	p2	s	s	2	1
425	AR	24	M	3	2	1	2	1	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	3	2	1	1	1	1	1	1	3	1

Appendix 4

Frequencies directly on survey

Frequencies of dentists who do not perform orthodontic treatment

1.Where is your primary location of practice?
43 NE
146 S
67 MW
67 W

2. How many years have you been in practice?
46 0-5
48 6-15
104 16-25
137 Over 25

3. Are you Male or Female?
268 Male
65 Female

4. Which of the following best describes your PRIMARY PRACTICE setting? (please check one)
189 Solo practice
43 Co-owner
68 An employee
27 An independent contractor

6. Patients should wear retainers **for at least 20 hours/day in the first 9 months** following active treatment. (please check one)
222 I agree
102 That is too much
7 That is not enough

7. **After the first year of retention**, patients should wear retainers at least 8 hours/day **forever**.
(please check one)
217 I agree
110 That is too much
5 That is not enough

8. a. What type of **maxillary** retainer do you think is the **MOST** beneficial to your patients?
(please check one)
121 Hawley retainer
102 Clear thermoplastic retainer
47 Fixed lingual retainer
6 Other. Please specify _____
46 Don't Know (Skip to Q 9.a)

8. b. How important are the various factors in determining the maxillary retainer type that is most beneficial to **your patients?**

	Very important	Moderately important	Not important	Don't know
Durability	201	72	2	
Compliance	270	7	277	
Convenience	188	78	6	
Cost	93	132	48	1
Hygiene issues	199	63	7	2

9.a. **What** type of **mandibular** retainer do you think is the **MOST** beneficial to **your patients**?
(please check one)

31 Hawley retainer
47 Clear thermoplastic retainer
205 Fixed lingual retainer
2 Other. Please specify _____
39 Don't know (skip to question 10 a)

9.b. How important are the various factors in determining the mandibular retainer type that is most beneficial to **your patients?**

	Very important	Moderately important	Not important	Don't know
Durability	218	62	2	
Compliance	251	21	9	
Convenience	192	69	13	
Cost	99	122	52	2
Hygiene issues	193	69	10	2

10. a.**What** type of **maxillary** retainer do you think is the **LEAST** beneficial to your patients?
(please check one)

52 Hawley retainer
58 Clear thermoplastic retainer
93 Fixed lingual retainer
3 Other. Please specify _____
122 Don't know (skip to Q 11 a)

10.b. How important are the various factors in determining the maxillary retainer type that is least beneficial to **your patients**?

	Very important	Moderately important	Not important	Don't know
Durability	93	56	18	9
Compliance	111	34	23	8
Convenience	85	56	23	9
Cost	58	64	44	12
Hygiene issues	101	49	21	10

11.a. **What** type of **mandibular** retainer do you think is the **LEAST** beneficial to **your patients**?
(please check one)
86 Hawley retainer
68 Clear thermoplastic retainer
44 Fixed lingual retainer
4 Other. Please specify _____
120 Don't know (skip to Q 12)

11.b. How important are the various factors in determining the mandibular retainer type that is least beneficial to **your patients**?

	Very important	Moderately important	Not important	Don't know
Durability	95	55	15	9
Compliance	115	28	21	10
Convenience	88	53	25	9
Cost	55	65	41	12
Hygiene issues	92	52	20	10

12. Which types of retainers do you **most** frequently see broken/damaged?
(please check one)
126 Hawley retainer
66 Clear thermoplastic retainer
73 Fixed lingual retainer
1 Other. Please specify _____
48 None of the above

13. How often do you repair/maintain/replace any type(s) of retainers?
146 never
169 1-9 times per year
9 10 or more times per year

14. Do you routinely charge your patients a fee to repair them?
120 Yes

78 No
124 N/A

15. When a patient needs a new retainer, what do you do most often? (please check one)
248 Send the patient back to an orthodontist
63 Make a new retainer yourself (or have your staff/lab make it)
11 Other

16. If you repair the retainer yourself do you ever give the patient something different than what their orthodontist gave them? (**if your answer is no, skip to question #18)**
79 Yes
194 No

17. If you do make a different retainer, how important are the various factors when making the decision on a new type of retainer?

	Very important	Moderately important	Not important	Don't know
Durability	56	17	2	
Compliance	66	8	1	
Convenience	50	22	4	
Cost	29	24	22	
Hygiene issues	57	17	1	

18. Who do you think should be responsible for retention of patients after orthodontic treatment?
21 The general dentist
130 The orthodontist
162 Both the general dentist and the orthodontist

19. Do you suggest that patients bring their retainers to their recall appointments?
277 yes
46 no

Thank you for your help in completing this survey.

Frequency of dentists who perform orthodontic treatments

1.Where is your primary location of practice?

1	NE
52	S
14	MW
17	W

2. How many years have you been in practice?

10	0-5
14	6-15
24	16-25
38	Over 25

3. Are you Male or Female?

66	Female
18	Male

4. Which of the following best describes your PRIMARY PRACTICE setting? (please check one)

62	Solo practice
17	Co-owner
6	An employee
1	An independent contractor

6. Patients should wear retainers **for at least 20 hours/day in the first 9 months** following active treatment. (please check one)

49	I agree
31	That is too much
5	That is not enough

7. **After the first year of retention**, patients should wear retainers at least 8 hours/day **forever**.
(please check one)

59	I agree
25	That is too much
1	That is not enough

8. a. What type of **maxillary** retainer do you think is the **MOST** beneficial to your patients?
(please check one)

30	Hawley retainer
34	Clear thermoplastic retainer
8	Fixed lingual retainer
3	Other. Please specify _____
2	Don't Know (Skip to Q 9.a)

8. b. How important are the various factors in determining the maxillary retainer type that is most beneficial to **your patients?**

	Very important	Moderately important	Not important	Don't know
Durability	59	20	1	
Compliance	79	2		
Convenience	55	25	80	
Cost	28	28	22	1
Hygiene issues	58	21	1	

9.a. **What** type of **mandibular** retainer do you think is the **MOST** beneficial to **your patients**?
(please check one)

7 Hawley retainer
23 Clear thermoplastic retainer
49 Fixed lingual retainer
3 Other. Please specify _____
1 Don't know (skip to question 10 a)

9.b. How important are the various factors in determining the mandibular retainer type that is most beneficial to **your patients?**

	Very important	Moderately important	Not important	Don't know
Durability	59	21	1	
Compliance	76	2	3	
Convenience	52	26	1	
Cost	30	27	22	
Hygiene issues	54	25		

10. a.**What** type of **maxillary** retainer do you think is the **LEAST** beneficial to your patients?
(please check one)

14 Hawley retainer
15 Clear thermoplastic retainer
27 Fixed lingual retainer
7 Other. Please specify _____
20 Don't know (skip to Q 11 a)

10.b. How important are the various factors in determining the maxillary retainer type that is least beneficial to **your patients**?

	Very important	Moderately important	Not important	Don't know
Durability	33	12	6	4

Compliance	35	10	5	5
Convenience	31	15	4	5
Cost	16	18	14	5
Hygiene issues	33	12	4	5

11.a. **What** type of **mandibular** retainer do you think is the **LEAST** beneficial to **your patients**?
(please check one)
31 Hawley retainer
22 Clear thermoplastic retainer
8 Fixed lingual retainer
4 Other. Please specify _____
18 Don't know (skip to Q 12)

11.b. How important are the various factors in determining the mandibular retainer type that is least beneficial to **your patients**?

	Very important	Moderately important	Not important	Don't know
Durability	35	14	4	2
Compliance	43	6	4	2
Convenience	34	15	4	2
Cost	16	21	16	2
Hygiene issues	31	15	5	2

12. Which types of retainers do you **most** frequently see broken/damaged?
(please check one)
29 Hawley retainer
27 Clear thermoplastic retainer
22 Fixed lingual retainer
0 Other. Please specify _____
3 None of the above

13. How often do you repair/maintain/replace any type(s) of retainers?
7 never
63 1-9 times per year
15 10 or more times per year

14. Do you routinely charge your patients a fee to repair them?
51 Yes
29 No
5 N/A

15. When a patient needs a new retainer, what do you do most often? (please check one)

12 Send the patient back to an orthodontist
67 Make a new retainer yourself (or have your staff/lab make it)
3 Other

16. If you repair the retainer yourself do you ever give the patient something different than what their orthodontist gave them? **(if your answer is no, skip to question #18)**
45 Yes
136 No

17. If you do make a different retainer, how important are the various factors when making the decision on a new type of retainer?

	Very important	Moderately important	Not important	Don't know
Durability	32	13	1	
Compliance	45	2	47	
Convenience	30	15	45	
Cost	18	14	13	
Hygiene issues	31	12	3	

18. Who do you think should be responsible for retention of patients after orthodontic treatment?
7 The general dentist
26 The orthodontist
49 Both the general dentist and the orthodontist

19. Do you suggest that patients bring their retainers to their recall appointments?
81 yes
3 no

Thank you for your help in completing this survey.

Frequencies of dentists who do and do not perform orthodontic treatment combined

1.Where is your primary location of practice?

44	NE
199	S
81	MW
85	W

2. How many years have you been in practice?

57	0-5
63	6-15
128	16-25
175	Over 25

3. Are you Male or Female?

84	Female
335	Male

4. Which of the following best describes your PRIMARY PRACTICE setting? (please check one)

251	Solo practice
61	Co-owner
74	An employee
28	An independent contractor

6. Patients should wear retainers **for at least 20 hours/day in the first 9 months** following active treatment. (please check one)

273	I agree
133	That is too much
12	That is not enough

7. **After the first year of retention**, patients should wear retainers at least 8 hours/day **forever**.
(please check one)

277	I agree
136	That is too much
6	That is not enough

8. a. What type of **maxillary** retainer do you think is the **MOST** beneficial to your patients?
(please check one)

151	Hawley retainer
137	Clear thermoplastic retainer
55	Fixed lingual retainer

9 Other. Please specify _____
48 Don't Know (Skip to Q 9.a)

8. b. How important are the various factors in determining the maxillary retainer type that is most beneficial to **your patients?**

	Very important	Moderately important	Not important	Don't know
Durability	262	92	3	
Compliance	351	9		
Convenience	244	104	6	
Cost	122	161	70	2
Hygiene issues	257	86	8	2

9.a. **What** type of **mandibular** retainer do you think is the **MOST** beneficial to **your patients**?
(please check one)
38 Hawley retainer
70 Clear thermoplastic retainer
256 Fixed lingual retainer
5 Other. Please specify _____
40 Don't know (skip to question 10 a)

9.b. How important are the various factors in determining the mandibular retainer type that is most beneficial to **your patients?**

	Very important	Moderately important	Not important	Don't know
Durability	279	83	3	
Compliance	329	23	12	
Convenience	246	95	14	
Cost	130	150	74	2
Hygiene issues	248	94	10	2

10. a.**What** type of **maxillary** retainer do you think is the **LEAST** beneficial to your patients?
(please check one)
66 Hawley retainer
73 Clear thermoplastic retainer
120 Fixed lingual retainer
10 Other. Please specify _____
144 Don't know (skip to Q 11 a)

10.b. How important are the various factors in determining the maxillary retainer type that is least beneficial to **your patients**?

	Very	Moderately	Not	Don't know

	important	important	important	
Durability	126	68	24	13
Compliance	146	44	28	13
Convenience	116	71	27	14
Cost	74	82	58	17
Hygiene issues	134	61	25	15

11.a. **What** type of **mandibular** retainer do you think is the **LEAST** beneficial to **your patients**?
(please check one)
118 Hawley retainer
90 Clear thermoplastic retainer
52 Fixed lingual retainer
8 Other. Please specify _____
139 Don't know (skip to Q 12)

11.b. How important are the various factors in determining the mandibular retainer type that is least beneficial to **your patients**?

	Very important	Moderately important	Not important	Don't know
Durability	131	69	19	11
Compliance	159	34	25	12
Convenience	123	68	29	11
Cost	71	87	57	14
Hygiene issues	124	67	25	12

12. Which types of retainers do you **most** frequently see broken/damaged?
(please check one)
155 Hawley retainer
93 Clear thermoplastic retainer
96 Fixed lingual retainer
1 Other. Please specify _____
51 None of the above

13. How often do you repair/maintain/replace any type(s) of retainers?
153 never
234 1-9 times per year
24 10 or more times per year

14. Do you routinely charge your patients a fee to repair them?
173 Yes
107 No
129 N/A

15. When a patient needs a new retainer, what do you do most often? (please check one)

261 Send the patient back to an orthodontist
131 Make a new retainer yourself (or have your staff/lab make it)
14 Other

16. If you repair the retainer yourself do you ever give the patient something different than what their orthodontist gave them? (**if your answer is no, skip to question #18)**

125 Yes
231 No

17. If you do make a different retainer, how important are the various factors when making the decision on a new type of retainer?

	Very important	Moderately important	Not important	Don't know
Durability	89	30	3	
Compliance	111	11	1	
Convenience	80	38	4	
Cost	48	38	35	
Hygiene issues	88	30	4	

18. Who do you think should be responsible for retention of patients after orthodontic treatment?

28 The general dentist
156 The orthodontist
213 Both the general dentist and the orthodontist

19. Do you suggest that patients bring their retainers to their recall appointments?

360 yes
49 no

Thank you for your help in completing this survey.