2008 JCO Study of Orthodontic Diagnosis and Treatment Procedures
Part 2 Breakdowns of Selected Variables

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Last month, the first installment of our report on the 2008 JCO Study of Orthodontic Diagnosis and Treatment Procedures examined trends in the specialty over the five surveys we have conducted since 1986, along with the methodology used in this Study. In the final two articles, we will present breakdowns of the most important diagnostic and treatment methods for three different groupings of respondents: by number of years in practice, geographic region, and gross income level.

Patient Demographics

There was no apparent relationship between the age of the practice and the age of patients treated (Table 20). Respondents in practice for 6-10 years reported the highest percentages of adult and two-phase cases, but the oldest practices reported the highest percentage of extraction cases. The oldest practices also showed the greatest mean numbers of surgical, TMJ, and Invisalign patients. On the other hand, the 16-to-20-year-old practices had the most skeletal-anchorage patients.

Pacific orthodontists reported the oldest current patients on average and the highest percentage of adult cases (Table 21). West North Central orthodontists tended to recommend initial exams later than their colleagues, at a mean age of 9, and also treated the highest percentage of two-phase cases. East South Central respondents were the only ones to approach 25% in extraction cases. Mean numbers of surgical-orthodontic patients ranged from 3.3 in New England to 7.6 in the Pacific and West North Central regions; of TMJ cases, from 8.1 in the Mountain region to 18.8 in the East and West North Central regions; of Invisalign cases, from 15.8 in the Mountain region to 27.5 in the Pacific region; and of skeletal-anchorage cases, from 4.8 in the Middle Atlantic and West North Central regions to 16.8 in the East South Central region.

Practices with the highest gross income reported both the youngest and oldest patients and, as would be expected, the greatest mean numbers of patients in every category—with an especially wide gap in Invisalign patients (Table 22). They also treated the lowest percentage of extraction cases. The smallest practices in terms of gross income showed the highest percentages of two-phase cases.

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TABLE 20
PATIENT DISTRIBUTION (MEANS) BY YEARS IN PRACTICE

	1-5	6-10	11-15	16-20	21-25	26+
Age of youngest current patient	6.5	6.6	6.4	7.0	6.6	6.6
Age of oldest current patient	66.3	67.9	68.4	67.5	67.7	65.5
Age recommended for first ortho exam	7.2	7.2	7.5	7.7	8.0	7.4
Age recommended to begin treatment	11.1	11.2	11.4	10.9	10.8	10.9
Adult active cases	23.8%	25.4%	25.0%	21.3%	20.9%	24.1%
Two-phase treatment cases	18.0%	21.9%	20.5%	21.3%	15.6%	16.5%
Extraction cases	16.5%	17.8%	17.6%	15.6%	19.9%	21.4%
Surgical-orthodontic cases*	5.2	6.6	4.9	5.8	6.8	6.9
TMJ cases*	7.0	8.8	11.7	11.3	13.7	18.2
Invisalign cases*	18.0	21.4	17.2	20.1	20.1	28.8
Skeletal-anchorage cases*	5.8	8.5	7.3	9.4	8.1	5.6

TABLE 21
PATIENT DISTRIBUTION (MEANS) BY GEOGRAPHIC REGION

	NE	MA	SA	ESC	ENC	WNC	MTN	WSC	PAC
Age of youngest current patient	6.6	6.6	6.9	6.7	6.5	6.6	6.5	6.8	6.5
Age of oldest current patient	63.9	65.2	67.9	65.3	67.2	66.2	65.9	65.5	69.2
Age for first ortho exam	7.4	7.3	7.5	7.3	7.3	9.0	7.4	7.4	7.8
Age to begin treatment	11.2	11.2	10.8	11.2	10.8	11.3	11.0	11.5	10.5
Adult active cases	20.3%	18.7%	26.3%	23.9%	21.9%	18.2%	23.5%	23.4%	27.5%
Two-phase treatment cases	15.1%	21.4%	19.5%	15.7%	19.8%	23.6%	16.9%	15.0%	19.7%
Extraction cases	21.2%	17.7%	18.6%	24.6%	17.6%	18.0%	16.1%	21.1%	18.7%
Surgical-orthodontic cases*	3.3	5.1	5.5	7.3	6.9	7.6	6.0	6.2	7.6
TMJ cases*	10.2	12.8	14.4	17.4	18.8	18.8	8.1	11.6	8.7
Invisalign cases*	25.6	20.8	22.8	22.8	22.8	21.0	15.8	20.7	27.5
Skeletal-anchorage cases*	8.1	4.8	6.1	16.8	9.1	4.8	7.6	7.2	7.9

TABLE 22
PATIENT DISTRIBUTION (MEANS) BY GROSS INCOME LEVEL

	Less than $200,000	$201,000-400,000	$401,000-600,000	$601,000-850,000	$851,000-1,100,000	More than $1,100,000
Age of youngest current patient	7.2	7.1	6.8	6.7	6.5	6.5
Age of oldest current patient	61.3	62.6	61.2	65.6	67.6	70.1
Age for first ortho exam	7.2	7.3	7.2	7.2	7.3	7.8
Age to begin treatment	10.4	11.1	11.4	10.9	10.9	11.1
Adult active cases	26.6%	22.6%	23.7%	22.7%	22.6%	23.6%
Two-phase treatment cases	21.8%	13.8%	16.1%	19.3%	19.9%	19.9%
Extraction cases	18.6%	24.5%	20.0%	21.0%	17.8%	17.1%
Surgical-orthodontic cases*	3.9	3.4	5.7	5.3	4.9	7.8
TMJ cases*	14.3	8.3	5.5	13.0	16.1	14.8
Invisalign cases*	7.8	9.3	12.0	13.2	19.4	31.9
Skeletal-anchorage cases*	3.7	3.4	5.4	8.1	6.1	8.1

*Mean numbers of 2007 patients for respondents who treated any patients in these categories.

Diagnostic Records

Older practices were more likely to use pretreatment and progress cephalometric analyses, but younger practices were slightly more likely to perform routine post-treatment analyses (Table 23). The oldest practices reported the least routine use of computerized tracings and imaging and the most routine use of manual tracings. The newest practices were less likely than others to use traditional analyses such as Downs, Ricketts, Steiner, and Tweed, and more likely to use their own analyses.

As in past surveys, there were obvious regional differences in the routine use of ceph-

KEY TO GEOGRAPHIC REGIONS

NE = New England (CT, ME, MA, NH, RI, VT)
MA = Middle Atlantic (NJ, NY, PA)
SA = South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV)
ESC = East South Central (AL, KY, MS, TN)
ENC = East North Central (IL, IN, MI, OH, WI)
WNC = West North Central (IA, KS, MN, MO, NE, ND, SD)
MTN = Mountain (AZ, CO, ID, MT, NV, NM, UT, WY)
WSC = West South Central (AR, LA, OK, TX)
PAC = Pacific (AK, CA, HI, OR, WA)

TABLE 23
ROUTINE USE OF CEPHALOMETRIC ANALYSES BY YEARS IN PRACTICE

	1-5	6-10	11-15	16-20	21-25	26+
Pretreatment	69.7%	68.6%	74.4%	75.9%	78.5%	75.9%
Progress	6.7	9.3	11.0	12.0	10.3	14.0
Post-treatment	31.5	31.4	28.0	25.0	26.2	30.1
Alabama	0.0	1.2	1.2	0.0	0.0	0.0
Alexander	3.4	1.2	3.7	1.9	0.9	2.4
Burstone	3.4	0.0	1.2	0.9	1.9	1.4
Downs	5.6	15.1	9.8	12.0	12.1	11.2
Eastman	1.1	0.0	0.0	1.9	0.0	0.0
Holdaway	1.1	4.7	2.4	4.6	5.6	5.9
Jarabak	4.5	1.2	1.2	1.9	12.1	4.9
McNamara	6.7	11.6	9.8	12.0	9.3	10.5
Northwestern	0.0	1.2	0.0	0.9	0.9	1.7
Ricketts	9.0	17.4	18.3	17.6	22.4	26.9
Sassouni	0.0	5.8	4.9	3.7	4.7	3.8
Steiner	23.6	37.2	35.4	38.9	35.5	32.2
Tweed	10.1	22.1	17.1	16.7	16.8	18.2
Viazis	0.0	1.2	1.2	0.0	0.9	0.3
Wits	20.2	26.7	14.6	23.1	23.4	18.2
“Eyeball”	21.3	19.8	24.4	13.9	15.9	15.7
Own analysis	31.5	26.7	14.6	29.6	19.6	21.0
Manual tracing	20.2	16.3	19.5	27.8	30.8	37.8
Computerized tracing	50.6	41.9	45.1	49.1	47.7	31.1
Computer imaging and analysis	21.3	22.1	34.1	23.1	21.5	16.1
Templates	1.1	3.5	1.2	3.7	0.9	2.4
VTO	2.2	0.0	3.7	1.9	6.5	4.9

alometric analyses, at least partly based on the home of the originator (Table 24). The Alabama and Tweed analyses were used most routinely in the East South Central region; the Alexander and Ricketts analyses in the West South Central region; the Burstone and Wits analyses in New England; the Downs, Eastman, Sassouni, and Steiner analyses in the Middle Atlantic region; the Holdaway and Viazis analyses in the Mountain region; the Jarabak analysis in the Pacific region; and the McNamara and Northwestern analyses in the East North Central region.

Respondents with higher gross income were generally more likely to use computerized tracings and less likely to use manual tracings and routine post-treatment tracings (Table 25). There were no noticeable patterns in the use of specific analyses according to income level.

Fixed Appliances

The newest practices were generally more likely than older practices to use self-ligating brackets rather than standard edgewise appliances (Table 26). The youngest practices were by far the most routine users of the MBT prescription; the Orthos prescription was used most routinely by respondents who had been in practice for 6-10 years, and the Roth prescription by those who had been in practice for 16-25 years.

TABLE 24
ROUTINE USE OF CEPHALOMETRIC ANALYSES BY GEOGRAPHIC REGION

	NE	MA	SA	ESC	ENC	WNC	MTN	WSC	PAC
Pretreatment	83.7%	69.6%	69.1%	70.6%	73.1%	82.6%	78.0%	82.1%	71.4%
Progress	11.6	13.7	10.8	11.8	12.0	4.3	8.5	14.3	10.3
Post-treatment	20.9	17.6	23.0	38.2	27.8	30.4	27.1	40.5	34.1
Alabama	2.3	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0
Alexander	2.3	2.0	1.4	2.9	0.9	0.0	3.4	7.1	1.6
Burstone	4.7	2.9	0.7	0.0	0.0	2.2	3.4	0.0	0.8
Downs	11.6	18.6	6.5	8.8	18.5	4.3	13.6	2.4	11.1
Eastman	0.0	1.0	0.7	0.0	0.9	0.0	0.0	0.0	0.8
Holdaway	2.3	5.9	3.6	2.9	3.7	2.2	8.5	3.6	4.8
Jarabak	0.0	2.9	4.3	2.9	5.6	2.2	5.1	4.8	7.1
McNamara	7.0	10.8	12.2	2.9	17.6	2.2	6.8	4.8	8.7
Northwestern	0.0	1.0	0.7	0.0	2.8	0.0	0.0	1.2	1.6
Ricketts	11.6	11.8	22.3	5.9	16.7	15.2	18.6	34.5	28.6
Sassouni	4.7	8.8	5.8	0.0	3.7	0.0	1.7	0.0	4.8
Steiner	41.9	44.1	28.8	29.4	30.6	13.0	37.3	28.6	38.1
Tweed	20.9	22.5	15.1	23.5	15.7	10.9	18.6	15.5	15.9
Viazis	0.0	1.0	0.0	2.9	0.9	0.0	3.4	0.0	0.0
Wits	34.9	26.5	14.4	14.7	20.4	6.5	27.1	16.7	19.8
“Eyeball”	25.6	17.6	17.3	14.7	24.1	17.4	23.7	10.7	15.9
Own analysis	16.3	13.7	18.7	29.4	29.6	41.3	25.4	22.6	21.4
Manual tracing	27.9	35.3	26.6	23.5	27.8	21.7	28.8	27.4	28.6
Computerized tracing	44.2	33.3	43.2	44.1	36.1	50.0	45.8	42.9	45.2
Computer imaging and analysis	16.3	11.8	20.1	20.6	18.5	28.3	25.4	29.8	23.0
Templates	0.0	2.0	1.4	0.0	3.7	10.9	0.0	0.0	2.4
VTO	2.3	2.0	5.0	8.8	3.7	0.0	0.0	2.4	8.7

TABLE 25
ROUTINE USE OF CEPHALOMETRIC ANALYSES BY GROSS INCOME LEVEL

	Less than $200,000	$201,000-400,000	$401,000-600,000	$601,000-850,000	$851,000-1,100,000	More than $1,100,000
Pretreatment	77.1%	72.3%	77.0%	82.2%	66.4%	72.9%
Progress	8.6	10.8	13.5	12.7	13.4	10.3
Post-treatment	37.1	38.6	33.8	30.5	24.4	24.9
Alabama	0.0	0.0	0.0	0.0	0.0	0.6
Alexander	0.0	1.2	2.7	6.8	0.8	1.5
Burstone	2.9	0.0	2.7	1.7	0.0	1.8
Downs	20.0	4.8	6.8	16.9	9.2	10.9
Eastman	0.0	0.0	0.0	0.0	1.7	0.6
Holdaway	0.0	6.0	2.7	5.1	2.5	5.5
Jarabak	0.0	6.0	4.1	5.9	4.2	4.9
McNamara	2.9	8.4	5.4	17.8	10.1	9.7
Northwestern	0.0	2.4	1.4	0.8	0.8	0.6
Ricketts	5.7	19.3	25.7	28.0	18.5	19.8
Sassouni	0.0	1.2	2.7	4.2	5.9	4.0
Steiner	28.6	26.5	25.7	44.1	32.8	33.7
Tweed	25.7	16.9	16.2	27.1	11.8	14.6
Viazis	0.0	1.2	0.0	0.0	0.0	0.6
Wits	22.9	14.5	18.9	29.7	16.0	19.5
“Eyeball”	8.6	15.7	12.2	17.8	16.8	20.7
Own analysis	17.1	18.1	27.0	27.1	17.6	24.9
Manual tracing	45.7	33.7	45.9	34.7	21.0	21.6
Computerized tracing	25.7	34.9	29.7	45.8	44.5	45.0
Computer imaging and analysis	22.9	21.7	13.5	24.6	23.5	21.0
Templates	2.9	1.2	1.4	5.1	2.5	1.2
VTO	5.7	7.2	2.7	1.7	2.5	4.6

TABLE 26
ROUTINE USE OF FIXED APPLIANCES BY YEARS IN PRACTICE

	1-5	6-10	11-15	16-20	21-25	26+
Begg	0.0%	0.0%	0.0%	0.0%	0.9%	0.7%
Bidimensional	8.9	5.8	3.5	1.9	7.5	3.5
Bioprogressive	4.4	1.2	2.4	2.8	4.7	5.2
Lingual	0.0	1.2	1.2	0.9	0.9	3.5
MEAW	0.0	0.0	0.0	0.9	0.0	0.3
Preadjusted prescription						
Alexander	1.1	3.5	4.7	6.5	2.8	7.3
Andrews	0.0	1.2	1.2	3.7	6.5	3.1
Hilgers	2.2	1.2	1.2	0.0	1.9	1.7
MBT	41.1	36.0	24.7	17.6	13.2	8.3
Orthos	2.2	10.5	5.9	8.3	2.8	3.5
Roth	35.6	31.4	42.4	51.9	57.9	46.2
Self-ligating						
Carrière	1.1	0.0	0.0	0.9	0.0	0.7
Damon	18.9	24.4	14.1	11.1	8.4	17.0
In-Ovation	23.3	19.8	18.8	17.6	19.6	16.7
SmartClip	7.8	9.3	7.1	1.9	4.7	2.1
SPEED	3.3	0.0	1.2	4.6	4.7	2.8
Standard edgewise	18.9	24.4	25.9	22.2	24.3	24.3
Tip-Edge	0.0	0.0	0.0	1.9	0.9	1.7

TABLE 27
ROUTINE USE OF FIXED APPLIANCES BY GEOGRAPHIC REGION

	NE	MA	SA	ESC	ENC	WNC	MTN	WSC	PAC
Begg	0.0%	0.0%	0.7%	0.0%	0.9%	0.0%	1.7%	0.0%	0.0%
Bidimensional	30.2	4.9	4.3	2.8	5.6	0.0	0.0	2.4	0.8
Bioprogressive	2.3	2.0	5.0	0.0	3.7	0.0	3.3	2.4	7.9
Lingual	4.7	0.0	1.4	0.0	3.7	0.0	1.7	4.8	0.8
MEAW	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0
Preadjusted prescription									
Alexander	2.3	2.0	2.1	5.6	2.8	6.4	5.0	17.9	2.4
Andrews	4.7	2.9	2.1	5.6	4.6	6.4	3.3	0.0	3.1
Hilgers	0.0	0.0	0.7	0.0	4.6	0.0	0.0	3.6	1.6
MBT	11.6	12.7	19.4	25.0	16.7	34.0	35.0	26.2	15.7
Orthos	2.3	1.0	5.0	5.6	9.3	2.1	5.0	2.4	8.7
Roth	46.5	57.8	50.7	50.0	41.7	36.2	43.3	26.2	44.9
Self-ligating									
Carrière	0.0	1.0	0.7	0.0	0.9	0.0	0.0	1.2	0.0
Damon	11.6	9.8	17.1	13.9	14.8	10.6	16.7	22.6	19.7
In-Ovation	7.0	12.7	21.4	16.7	21.3	25.5	18.3	22.6	21.3
SmartClip	9.3	2.0	5.0	5.6	3.7	4.3	5.0	3.6	6.3
SPEED	0.0	6.9	4.3	0.0	3.7	0.0	1.7	1.2	2.4
Standard edgewise	23.3	17.6	30.7	33.3	20.4	19.1	20.0	25.0	19.7
Tip-Edge	2.3	1.0	0.0	0.0	2.8	2.1	1.7	1.2	0.0

TABLE 28
ROUTINE USE OF FIXED APPLIANCES BY GROSS INCOME LEVEL

	Less than $200,000	$201,000-400,000	$401,000-600,000	$601,000-850,000	$851,000-1,100,000	More than $1,100,000
Begg	2.9%	0.0%	0.0%	0.8%	0.0%	0.6%
Bidimensional	0.0	7.2	4.1	2.5	3.3	6.0
Bioprogressive	2.9	8.4	6.8	5.0	4.2	1.8
Lingual	2.9	0.0	4.1	0.0	3.3	1.8
MEAW	0.0	0.0	0.0	0.0	0.8	0.3
Preadjusted prescription						
Alexander	0.0	6.0	6.8	6.7	5.0	4.2
Andrews	0.0	2.4	1.4	3.3	2.5	3.6
Hilgers	0.0	1.2	1.4	1.7	0.8	1.5
MBT	22.9	21.7	20.3	20.8	15.0	20.5
Orthos	5.7	3.6	4.1	2.5	1.7	7.2
Roth	51.4	43.4	44.6	48.3	50.8	40.7
Self-ligating						
Carrière	0.0	0.0	1.4	0.8	0.0	0.6
Damon	8.6	6.0	10.8	9.2	20.8	20.5
In-Ovation	11.4	16.9	16.2	20.0	19.2	20.2
SmartClip	5.7	6.0	1.4	3.3	3.3	5.7
SPEED	2.9	2.4	5.4	3.3	4.2	1.5
Standard edgewise	37.1	38.6	23.0	24.2	16.7	21.4
Tip-Edge	2.9	3.6	1.4	2.5	0.0	0.0

Regional differences could also be seen in the routine use of fixed appliances (Table 27). Bidimensional appliances were used by far the most commonly in New England. Of the other fixed appliances employed by at least 5% of the respondents in any region, the Bioprogressive system was used most routinely in the Pacific region; Alexander and Damon in the West South Central region; Andrews and In-Ovation in the West North Central region; MBT in the Mountain region; Orthos in the East North Central region; Roth and SPEED in the Middle Atlantic region; SmartClip in New England; and standard edgewise in the East South Central region.

TABLE 29
BRACKET TYPES USED (MEANS) BY YEARS IN PRACTICE

	1-5	6-10	11-15	16-20	21-25	26+
Stainless steel	80.0%	74.9%	82.1%	85.4%	82.4%	84.7%
Ceramic	19.8	14.8	14.8	11.3	11.6	12.6
Plastic	0.0	0.2	0.2	0.6	0.0	0.5
Gold	0.5	0.6	1.1	0.8	1.0	1.0
Titanium	0.3	3.6	0.1	1.2	1.2	0.8
Combination	1.0	8.2	2.1	3.3	3.5	3.4
Slot size						
.018"	18.5	29.9	36.3	35.6	33.6	36.1
.022"	74.1	63.8	61.2	60.4	61.3	60.0
Bidimensional	7.6	6.3	3.8	2.1	4.1	2.6
Other	2.6	2.7	1.2	3.0	2.5	9.7
Recycling						
Metal	2.3	3.4	0.0	3.0	2.5	7.1
Ceramic	0.0	1.3	0.0	0.5	0.2	0.9

TABLE 30
BRACKET TYPES USED (MEANS) BY GEOGRAPHIC REGION

	NE	MA	SA	ESC	ENC	WNC	MTN	WSC	PAC
Stainless steel	84.7%	84.4%	82.1%	82.3%	83.6%	79.0%	84.0%	84.7%	80.1%
Ceramic	17.8	13.0	13.6	19.4	15.4	12.7	14.5	11.2	11.9
Plastic	0.2	0.4	0.4	0.0	0.2	0.0	0.0	0.7	0.6
Gold	0.4	0.2	0.4	1.5	0.9	0.8	1.0	0.4	2.0
Titanium	0.3	0.0	1.5	3.0	2.0	0.1	0.2	1.4	1.3
Combination	0.8	2.4	4.7	0.0	1.9	5.1	4.5	5.1	4.7
Slot size									
.018"	24.8	30.8	27.9	35.4	30.3	43.0	27.6	38.2	33.0
.022"	45.6	65.4	66.9	64.9	65.6	57.0	70.6	57.8	64.8
Bidimensional	27.6	4.9	4.0	0.0	3.0	0.0	1.8	0.6	0.2
Other	1.1	6.3	5.5	8.6	3.5	2.4	7.7	4.8	5.5
Recycling									
Metal	5.7	3.6	4.4	2.5	6.2	4.3	3.2	1.4	4.0
Ceramic	0.0	1.3	0.7	0.2	0.7	0.5	0.0	0.0	0.0

TABLE 31
BRACKET TYPES USED (MEANS) BY GROSS INCOME LEVEL

	Less than $200,000	$201,000-400,000	$401,000-600,000	$601,000-850,000	$851,000-1,100,000	More than $1,100,000
Stainless steel	84.4%	82.7%	88.5%	83.6%	81.2%	81.3%
Ceramic	12.2	15.0	10.4	10.9	11.2	16.6
Plastic	0.1	0.4	0.9	0.2	0.5	0.3
Gold	0.4	0.2	0.6	1.5	0.5	1.1
Titanium	1.9	0.2	0.1	1.0	1.0	1.5
Combination	3.8	3.6	2.0	3.2	4.7	3.5
Slot size						
.018"	13.0	28.4	35.0	38.4	33.4	33.4
.022"	83.0	66.5	60.2	58.7	60.4	61.6
Bidimensional	1.5	6.3	1.5	2.7	2.9	4.8
Other	6.7	7.8	2.6	3.2	8.1	3.9
Recycling						
Metal	6.6	7.6	9.6	6.1	3.6	1.2
Ceramic	3.0	0.0	1.7	0.4	0.9	0.2

TABLE 32
ROUTINE USE OF ADHESIVES BY YEARS IN PRACTICE

	1-5	6-10	11-15	16-20	21-25	26+
Direct bonding	93.3%	88.2%	92.9%	86.9%	90.5%	88.2%
Indirect bonding						
Labial	8.9	15.3	12.9	16.8	10.5	13.2
Lingual	3.3	5.9	4.7	4.7	1.0	5.2
Two-part chemical-cure sealant	10.0	10.6	7.1	17.8	19.0	21.2
Light-cured flowable microfill	50.0	57.6	57.6	49.5	55.2	56.3
Glass ionomer for bonding	7.8	7.1	8.2	9.3	5.7	6.9
Enamel-protective sealant	14.4	23.5	29.4	29.9	31.4	29.2
Fluoride varnish	14.4	12.9	9.4	7.5	6.7	8.0
Adhesion booster	16.7	20.8	18.8	14.0	22.9	21.9
Self-etching primer	40.0	39.4	36.5	28.0	24.8	20.6
Phosphoric acid etchant	67.8	64.7	60.0	64.5	68.6	69.1
Type of adhesive (chemically cured)						
No-mix	27.8	36.5	33.3	35.5	33.3	35.4
Two-paste	5.6	8.2	8.2	15.0	18.1	17.1
Type of adhesive (light-cured)						
No-mix	78.9	80.0	79.8	73.8	72.4	67.7
Two-paste	4.4	4.7	2.4	4.7	5.7	7.6
Precoated	20.0	17.6	12.9	14.0	13.3	9.4
Type of band cement						
Glass ionomer	40.0	36.5	31.8	45.8	40.0	34.4
Light-cured glass ionomer	44.4	41.2	40.0	30.8	30.5	28.1
One-paste compomer (light-cured)	17.8	14.1	17.6	10.3	10.5	17.0
Two-paste compomer	1.1	7.1	2.4	6.5	7.6	4.5
Zinc phosphate	2.2	1.2	1.2	0.9	7.6	9.4

In general, the practices with lower gross income were more likely than practices with higher gross income to use standard edgewise appliances, and less likely to use self-ligating brackets (Table 28). Practices with the lowest gross income were also the most routine users of MBT and Roth prescriptions.

Brackets

The youngest practices tended to use ceramic brackets more routinely and stainless steel brackets less routinely than the oldest practices (Table 29). They were also far more likely than others to use .022" and Bidimensional slots.

There was not much difference in the use of stainless steel brackets by region, although West North Central orthodontists used them the least routinely (Table 30). Ceramic brackets were most popular among East South Central and New England practices. The .018" slot was used most routinely in the West North Central region, the .022" slot was most favored in the Mountain region, and the Bidimensional slot was used almost exclusively in New England. The most recycling was done by East North Central and New England orthodontists, and the least by West South Central practices.

TABLE 33
ROUTINE USE OF ADHESIVES BY GEOGRAPHIC REGION

	NE	MA	SA	ESC	ENC	WNC	MTN	WSC	PAC
Direct bonding	95.3%	92.2%	90.7%	91.7%	86.1%	80.9%	88.1%	88.0%	90.5%
Indirect bonding									
Labial	7.0	9.8	12.1	13.9	13.9	25.5	13.6	16.9	12.7
Lingual	4.7	4.9	1.4	5.6	2.8	4.3	6.8	8.4	4.0
Two-part chemical-cure sealant	14.0	27.5	13.6	11.1	16.7	10.6	18.6	8.4	16.7
Light-cured flowable microfill	53.5	55.9	57.1	58.3	58.3	53.2	44.1	44.6	59.5
Glass ionomer for bonding	4.7	4.9	7.9	13.9	6.5	10.6	8.5	4.8	9.5
Enamel-protective sealant	20.9	35.3	22.9	33.3	28.7	17.0	18.6	30.1	32.5
Fluoride varnish	14.0	5.9	6.4	19.4	6.5	14.9	13.6	9.6	10.3
Adhesion booster	27.9	19.6	22.9	8.3	21.3	10.6	11.9	24.1	21.4
Self-etching primer	20.9	22.8	33.6	27.8	28.7	36.2	30.5	36.6	27.8
Phosphoric acid etchant	60.5	62.7	65.7	75.0	73.1	51.1	71.2	67.5	65.9
Type of adhesive (chemically cured)									
No-mix	30.2	47.5	32.9	30.6	34.3	21.3	28.8	31.3	34.9
Two-paste	20.7	13.7	13.6	11.1	14.8	12.8	10.2	10.8	11.2
Type of adhesive (light-cured)									
No-mix	67.4	74.5	75.0	61.1	75.0	65.2	67.8	75.9	79.4
Two-paste	9.3	4.9	4.3	8.3	7.4	6.4	10.2	3.6	2.4
Precoated	18.6	10.8	11.4	11.1	14.8	17.0	18.6	10.8	13.5
Type of band cement									
Glass ionomer	37.2	44.1	32.9	44.4	32.4	29.8	37.3	32.5	45.2
Light-cured glass ionomer	27.9	32.4	37.9	36.1	26.9	40.4	35.6	33.7	33.3
One-paste compomer (light-cured)	11.6	13.7	17.1	11.1	12.0	14.9	11.9	24.1	13.5
Two-paste compomer	7.0	2.9	4.3	2.8	6.5	10.6	6.8	1.2	4.0
Zinc phosphate	11.6	3.9	6.4	2.8	10.2	2.1	3.4	2.4	3.2

Respondents with the lowest gross income were by far the most likely to use .022" bracket slots (Table 31). Middle-income practices tended to use more stainless steel brackets and fewer ceramic brackets than their colleagues did, and they also reported recycling a higher percentage of their metal brackets.

Adhesives

The newest practices were somewhat more likely to use direct bonding as opposed to indirect bonding (Table 32). Older practices were much more likely than others to use sealants and chemically cured adhesives, while newer practices made more routine use of self-etching primers and light-cured adhesives. Zinc phosphate band cements were seldom used routinely by respondents who had been in practice for less than 21 years; these clinicians apparently preferred glass ionomer cements.

Direct bonding was used most frequently in New England; indirect bonding was most popular in the West North Central region (Table 33). Middle Atlantic respondents were most likely to use sealants and chemically cured adhesives.

Higher-income practices were more likely than others to bond indirectly rather than directly

TABLE 34
ROUTINE USE OF ADHESIVES BY GROSS INCOME LEVEL

	Less than $200,000	$201,000-400,000	$401,000-600,000	$601,000-850,000	$851,000-1,100,000	More than $1,100,000
Direct bonding	94.1%	95.2%	89.2%	85.8%	89.1%	88.8%
Indirect bonding						
Labial	8.8	4.8	12.2	14.2	11.8	16.3
Lingual	2.9	3.6	5.4	2.5	4.2	4.5
Two-part chemical-cure sealant	11.8	24.1	13.5	21.7	11.8	15.4
Light-cured flowable microfill	58.8	48.2	52.7	51.7	52.1	58.9
Glass ionomer for bonding	5.9	4.8	9.5	5.8	10.1	7.3
Enamel-protective sealant	26.5	22.9	23.0	29.2	28.6	27.8
Fluoride varnish	5.9	10.8	10.8	9.2	5.0	11.2
Adhesion booster	11.8	18.1	23.0	15.8	16.8	22.7
Self-etching primer	26.5	27.7	24.3	27.5	28.6	32.5
Phosphoric acid etchant	58.8	75.9	62.2	65.0	64.7	67.7
Type of adhesive (chemically cured)						
No-mix	20.6	33.7	35.1	38.3	37.8	33.3
Two-paste	17.6	20.5	13.5	15.8	10.1	12.1
Type of adhesive (light-cured)						
No-mix	64.7	68.7	77.0	68.3	74.8	74.8
Two-paste	2.9	8.4	6.8	8.3	6.7	3.6
Precoated	17.6	8.4	5.4	15.0	12.6	15.4
Type of band cement						
Glass ionomer	35.3	32.5	48.6	35.0	37.8	38.4
Light-cured glass ionomer	38.2	30.1	29.7	31.7	31.9	34.1
One-paste compomer (light-cured)	5.9	18.1	14.9	20.0	17.6	11.8
Two-paste compomer	5.9	4.8	5.4	5.8	2.5	4.8
Zinc phosphate	8.8	15.7	8.1	1.7	2.5	4.2

TABLE 35
ROUTINE USE OF ARCHWIRES BY YEARS IN PRACTICE

	1-5	6-10	11-15	16-20	21-25	26+
Early wires						
Stainless steel	27.8%	35.3%	32.9%	51.9%	52.8%	43.8%
Multistranded/braided stainless steel	5.6	8.2	5.9	13.0	11.3	9.7
Nickel titanium	95.6	89.4	95.3	85.0	85.8	82.3
Multistranded/braided nickel titanium	2.2	4.7	2.4	1.9	2.8	3.8
Chrome cobalt nickel	1.1	5.9	1.2	9.3	8.5	7.6
Titanium molybdenum	12.2	18.8	14.1	20.4	15.1	15.6
Titanium niobium	1.1	1.2	1.2	0.9	1.9	1.0
Thermally activated titanium	10.0	14.1	24.7	13.9	18.9	14.6
Coated	1.1	1.2	0.0	0.9	1.9	1.4
Finishing wires						
Stainless steel	75.6	81.2	76.5	76.9	72.6	68.4
Multistranded/braided stainless steel	7.8	5.9	1.2	3.7	2.8	2.1
Nickel titanium	12.2	10.6	15.3	13.9	13.3	15.3
Multistranded/braided nickel titanium	0.0	1.2	2.4	1.9	2.8	1.0
Chrome cobalt nickel	1.1	1.2	0.0	0.9	3.8	4.2
Titanium molybdenum	30.0	31.8	32.9	22.2	24.5	17.4
Titanium niobium	2.2	2.4	0.0	0.9	0.0	1.0
Thermally activated titanium	2.2	3.5	1.2	1.9	3.8	2.1
Coated	0.0	0.0	0.0	0.9	0.0	0.3

TABLE 36
ROUTINE USE OF ARCHWIRES BY GEOGRAPHIC REGION

	NE	MA	SA	ESC	ENC	WNC	MTN	WSC	PAC
Early wires									
Stainless steel	44.2%	44.1%	45.7%	47.2%	39.3%	36.2%	37.3%	45.2%	37.8%
Multistranded/braided stainless steel	11.6	16.7	5.7	13.9	8.4	8.5	15.3	8.3	6.3
Nickel titanium	92.9	87.3	87.9	91.7	89.7	83.0	84.7	90.5	81.9
Multistranded/braided nickel titanium	2.3	5.9	4.3	0.0	1.9	4.3	1.7	4.8	1.6
Chrome cobalt nickel	7.0	5.9	7.1	5.6	2.8	0.0	6.8	4.8	11.8
Titanium molybdenum	9.3	15.7	19.3	8.3	15.9	19.1	15.3	19.0	13.4
Titanium niobium	0.0	1.0	2.1	2.8	3.7	0.0	0.0	0.0	0.0
Thermally activated titanium	18.6	18.6	17.1	5.6	17.8	12.8	13.6	11.9	16.5
Coated	2.3	2.9	0.0	2.8	0.0	0.0	0.0	2.4	0.0
Finishing wires									
Stainless steel	88.4	68.6	65.7	86.1	65.4	70.2	72.9	77.4	77.2
Multistranded/braided stainless steel	4.7	5.9	2.9	2.8	2.8	2.1	5.1	4.8	3.1
Nickel titanium	14.0	21.6	14.3	14.3	15.9	8.5	10.2	7.1	15.0
Multistranded/braided nickel titanium	2.3	1.0	0.7	0.0	1.9	2.1	1.7	0.0	3.1
Chrome cobalt nickel	2.3	2.9	2.9	5.6	0.0	0.0	1.7	1.2	4.7
Titanium molybdenum	14.0	22.5	29.3	22.2	29.9	27.7	23.7	17.9	22.0
Titanium niobium	0.0	1.0	2.1	0.0	0.9	0.0	0.0	0.0	2.4
Thermally activated titanium	4.7	2.0	3.6	0.0	1.9	0.0	5.1	0.0	2.4
Coated	0.0	1.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0

TABLE 37
ROUTINE USE OF ARCHWIRES BY GROSS INCOME LEVEL

	Less than $200,000	$201,000-400,000	$401,000-600,000	$601,000-850,000	$851,000-1,100,000	More than $1,100,000
Early wires						
Stainless steel	57.1%	49.4%	33.8%	44.5%	37.0%	42.0%
Multistranded/braided stainless steel	2.9	12.0	12.2	10.1	8.4	8.8
Nickel titanium	82.9	83.1	85.1	84.9	85.7	90.3
Multistranded/braided nickel titanium	2.9	1.2	6.8	4.2	2.5	2.7
Chrome cobalt nickel	8.6	4.8	10.8	7.6	6.7	4.8
Titanium molybdenum	11.4	15.7	14.9	12.6	13.4	18.7
Titanium niobium	0.0	2.4	1.4	0.8	1.7	0.9
Thermally activated titanium	2.9	14.5	21.6	12.6	16.8	17.8
Coated	0.0	1.2	0.0	2.5	0.0	1.2
Finishing wires						
Stainless steel	68.6	78.3	79.7	78.2	62.2	72.2
Multistranded/braided stainless steel	0.0	4.8	4.1	4.2	1.7	4.2
Nickel titanium	20.0	9.6	17.6	18.5	15.1	11.8
Multistranded/braided nickel titanium	0.0	0.0	1.4	0.0	1.7	2.4
Chrome cobalt nickel	5.7	4.8	2.7	2.5	1.7	2.1
Titanium molybdenum	5.7	21.7	25.7	21.8	26.1	25.7
Titanium niobium	0.0	0.0	0.0	1.7	0.8	1.5
Thermally activated titanium	0.0	1.2	1.4	1.7	3.4	3.0
Coated	0.0	0.0	0.0	0.8	0.0	0.3

(Table 34). Use of other adhesive methods did not appear related to gross income level.

Archwires

Compared to older respondents, younger orthodontists used nickel titanium archwires in the early stages of treatment much more routinely than stainless steel archwires (Table 35). They were also more likely to use titanium molybdenum (TMA) finishing archwires.

New England practices were the most routine users of nickel titanium initial archwires, but also of stainless steel finishing archwires (Table 36). East North Central practices were the least likely to use stainless steel finishing wires and the most likely to use TMA finishing wires. East South Central practices used stainless steel wires most routinely in the early stages, and were second to New England in the routine use of stainless steel finishing wires.

Respondents with the lowest gross income were the most likely to use stainless steel initial archwires and the least likely to use nickel titanium initial archwires (Table 37). On the other hand, they were the most likely to use nickel titanium finishing archwires (although only 20% of them used these wires routinely). Practices with higher gross income tended to use TMA wires more often for finishing.

(TO BE CONTINUED)