The influence of demographic factors of Nigerian dentists on their satisfaction with duration of orthodontic treatment and knowledge of accelerated orthodontics

ABSTRACT

Background: The duration of orthodontic treatment and the knowledge of accelerated orthodontics are very important to the dental practitioner butthere are limited information on the relationship between their satisfaction with duration of orthodontic treatment and knowledge of accelerated orthodontics. **Aim**: To assess the associations between satisfactions of Nigerian dental practitioners with the duration of orthodontic treatment and their knowledge of accelerated orthodontics. **Materials and Methods**: Electronic and physical methods of surveying the Nigerian dental practitioners were carried out between January and June 2023. The contents of the questionnaire involving satisfaction with duration of orthodontic treatment and the knowledge of accelerated orthodontics were analysed for associations with the participants' demographics, using the IBM SPSS version 25. Descriptive statistics, the ANOVA and independent t-test were used with the significance level set at $P < .05$. **Results**: No statistically significant associations were found between the dentists' satisfaction with duration of orthodontic treatment and their age, gender and years of practice as dentists ($P > .05$). Also, nostatistically significant associations were found between the dentists' knowledge of the methods of accelerated orthodontics and age ($P > .05$). Statistically significant associations were found between the male gender and knowledge of administration of biological substances and piezocision, while the highest number of methods of accelerated orthodontics was statistically significantly associated with the years of practice of dentistry ($P < .05$). **Conclusion**: Although no significant associations were found between the participants' demographics and satisfaction with duration of orthodontic treatment, gender gave significant associations with knowledge of two methods of accelerated orthodontics, while years of practice of dentistry revealed the most significant associations with knowledge of accelerated orthodontics.

Keywords: Associations, Dentists' Demographics, Duration of Orthodontic Treatment, Knowledge, Accelerated Orthodontics

1. INTRODUCTION

According to Al-Attar et al [1], no consensus about the duration of orthodontic treatment has been reached. However, a long term of orthodontic treatment is considered as a primary concern for most orthodontists and patients looking for treatment [2].

Accelerated orthodontics could be possible by mechanical stimulation or device assisted therapy, surgical therapy and by the use of pharmacological agents [3]. Both orthodontists and patients were interested in techniques that can decrease the treatment duration. Non-invasive accelerating procedures were more preferable by orthodontists and patients than invasive surgical procedures [1].

Not much is known about the role of socioeconomic and psychosocial factors in the predictions of the duration of orthodontic treatment [4]. Maternal emotional support was found to be an important predictor of duration of orthodontic treatment. This was attributed to higher maternal involvement in the orthodontic treatment, which could have facilitated achieving the required orthodontic treatment outcome in shorter treatment duration [4]. According to Mavreas and Athanasiou [5], various factors, such as the technique employed, the skill and number of operators involved, the compliance of the patients, and the severity of the initial malocclusion, all seem to play a role. Moresca [6] concluded that treatment time varies according to the type of malocclusion and treatment options, and orthodontist's influence, patient's characteristics and compliance are all decisive in determining treatment time, while the effects provided by orthodontic appliances and methods used to speed tooth movement up seem little effective. Based on the results of a recent study [7], missed sessions, treatment plan, and bracket debonding gave the greatest effect on the duration of fixed orthodontic treatment.

Although much progress has been made concerning accelerated orthodontics globally [1-3, 6-25], only two related reports have come from Nigeria [26, 27]. In addition, not much is known about the impact or influence of gender, age and years of practice experience could have on dental practitioners' view on the relatively long periodof orthodontic treatment and the new methods of shortening it. Therefore, this study aimed at assessing the influence of gender, age and years of practice as dental practitioners on the satisfaction of some Nigerian dental practitionerswith duration of orthodontic treatment, as well astheir knowledge of accelerated orthodontics. It was hypothesized that there would not be any statistically significant associations between their satisfaction with duration of orthodontic treatment and the demographic factors, as well as between their knowledge of accelerated orthodontics and the same demographic factors.

2. MATERIALS AND METHODS

2.1. Study Design

A national self-administered questionnaire-based cross-sectional survey of Nigerian dentists was carried out, which targeted the teaching hospitals across the nation, as well as other hospitals where dentists work.

2.2. Data Collection

This national survey was carried out using Google forms through the Nigerian Dental Association social platform and other different social platforms of Nigerian dentists such as the Consultants' and Resident doctors' platforms. According to the Nigerian Dental Association (NDA), the estimated number of dentists in Nigeria is currently about 4000 to 4500. While ensuring that no dentist filled the questionnaire more than once, some of the teaching hospitals were visited with the questionnaire physically. In all, one hundred and twenty five (125) dentists filled and returned the questionnaire, giving a response rate of 50% previously reported [27]. This report is part of a major Nigerian study part of which has earlier been published [27]. The aspect of the questionnaire used in the present report is attached as an Appendix.

2.3. Null Hypotheses

The following null hypotheses were generated and tested:

Ho1 - that there would not be any statistically significant association between the dentists' satisfaction with duration of orthodontic treatment and their demographic factors (age group, gender and their years of practice as dentists)

Ho2 – that there would not be any statistically significant association between theirknowledge of accelerated orthodontics and the same demographic factors (age group, gender and their years of practice as dentists)

2.4. Data Analysis

Using the SPSS version 25, the whole data was analysed descriptively, as well as using independent t-test and ANOVA statistics for the hypotheses. The significance level was set at $P < .05$.

3. RESULTS and Discuaaion

Table 1 below provides the descriptive statistics of the participants' demographics, which shows that majority of the Nigerian dentists, were aged between 30 and 39, followed by the 40-49 age groups. Slightly over 55% were male, while 36% of them have practiced over 10 years.

Table 1: Descriptive statistics of the participants' demographics

		n	%
Age group	20-29	21	16.8
	30-39	62	49.6
	40-49	30	24.0
	50-59	10	8.0
	60-69	2	1.6
Gender	Male	69	55.2
	Female	56	44.8
Years of Practice	0-5	36	28.8
	6-10	44	35.2
	>10	45	36.0
	Total	**125**	**100.0**

Below is Table 2 which shows the participants' demographics against their satisfaction with duration of orthodontic treatment, which did not reveal any statistically significant relationships or associations (P >.05).

Table 2: Statistical analysis of the participants' demographics against satisfaction with duration of orthodontic treatment using ANOVA and Independent T-test

		Satisfied with duration of active orthodontic treatment		p-value
		Mean (SD)		
Age group	20-29	2.71 (1.06)		
	30-39	2.81 (1.11)	0.418	0.796
	40-49	2.87 (1.04)		
	50-59	3.20 (1.03)		
	60above	2.50 (.71)		
Gender	Male	2.91 (1.16)	0.886	0.348
	Female	2.73 (.94)		

Year of Practice	0-5	2.61 (1.13)		
	6-10	2.98 (1.05)	1.204	0.303
	>10	2.87 (1.04)		

1…very satisfied, 5……very dissatisfied

Table 3 has the ANOVA statistics of the age groups of the participants against their knowledge of the different methods of accelerated orthodontics with no statistically significant relationship observed (P >.05).

Table 3: ANOVA statistics of the age groups of the participants against their knowledge of the different methods of accelerated orthodontics

	Age group										F	P-value
	20-29		30-39		40-49		50-59		60-69			
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)		
Use of some medications	.48	(.51)	.61	(.49)	.80	(.41)	.80	(.42)	.50	(.71)	1.86	.122
Administration of biological substances	.67	(.48)	.48	(.50)	.63	(.49)	.70	(.48)	.50	(.71)	0.96	.430
Direct light electric current	.43	(.51)	.39	(.49)	.57	(.50)	.30	(.48)	.50	(.71)	0.86	.491
Low level laser therapy	.52	(.51)	.55	(.50)	.67	(.48)	.50	(.53)	.50	(.71)	0.41	.802
Resonance vibration	.52	(.51)	.71	(.46)	.80	(.41)	.60	(.52)	.50	(.71)	1.31	.272
Corticotomies	.57	(.51)	.73	(.45)	.80	(.41)	.70	(.48)	.50	(.71)	0.91	.464
Piezocision	.6	(.50)	.6	(.50)	.6	(.50)	.8	(.42)	.5	(.71)	0.54	.709

0=No, 1=Yes

The T-test analysis of the gender of the participants against their knowledge of the different methods of accelerated orthodontics is provided in table 4 below, which reveals statistically significant associations in relation to administration of substances (P = .035) and piezocision (P =.001) for male gender.

Table 4: Independent T-test statistics of the gender of the participants against their knowledge of the different methods of accelerated orthodontics

	Gender		T-Test	P-value
	Male	Female		
	Mean (SD)	Mean (SD)		
Use of some medications	.70 (.46)	.59 (.50)	1.52	0.219
Administration of biological substances	.65 (.48)	.46 (.50)	4.53	0.035*
Direct light electric current	.51 (.50)	.34 (.48)	3.59	0.060
Low level laser therapy	.58 (.50)	.55 (.50)	.08	0.771
Resonance vibration	.68 (.47)	.70 (.46)	.03	0.856
Corticotomies	.77 (.43)	.64 (.48)	2.37	0.126
Piezocision	.7 (.45)	.4 (.50)	12.12	0.001*

0=No, 1=Yes; *statistically significant

Table 5 below provides the ANOVAstatistics of the years of practice of the participants against their knowledge of the different methods of accelerated orthodontics, confirming statistically significant associations (P <.05) in four out of the seven methods of accelerated orthodontics tested.

Table 5: ANOVA statistics of the years of practice of the participants against their knowledge of the different methods of accelerated orthodontics

	Year of practice			F	P-value
	0-5	6-10	>10		
	Mean (SD)	Mean (SD)	Mean (SD)		
Use of some medications	.50 (.51)	.59 (.50)	.82 (.39)	5.35	0.006*
Administration of biological substances	.61 (.49)	.50 (.51)	.60 (.50)	0.64	0.531
Direct light electric current	.42 (.50)	.39 (.49)	.49 (.51)	0.49	0.612
Low level laser therapy	.39 (.49)	.59 (.50)	.69 (.47)	3.88	0.023*
Resonance vibration	.47 (.51)	.77 (.42)	.78 (.42)	5.86	0.004*
Corticotomies	.58 (.50)	.68 (.47)	.84 (.37)	3.59	0.030*
Piezocision	.6 (.50)	.6 (.49)	.6 (.50)	0.14	0.866

0=No, 1=Yes; *statistically significant

This first African study that examined the influence or impact of some demographic factors of Nigerian dentists on their satisfaction with duration of orthodontic treatment and their knowledge of accelerated orthodonticshas revealed no significant associations between gender, age and years of practice as dentists with their satisfaction with the duration of orthodontic treatment. It has also revealed no significant association between the participants' age and their knowledge of accelerated orthodontics but some significant associations were found with knowledge of some the methods of accelerated orthodontics (administration of some biological substances and piezocision) with male gender. Over 10 years of practice as dentists produced significant associations with knowledge of some of the methods of accelerated orthodontics (use of some medications, low level laser therapy, resonance vibration and corticotomies).

A systemic review of factors affecting orthodontic treatment duration by Mavreas and Athanasiou [5] revealed that, among other factors, the technique employed, the skill and number of operators involved, the compliance of the patients, and the severity of the initial malocclusion, all seem to play a role. In addition, Moresca [6] found that treatment time varied according to the type of malocclusion and treatment options, and orthodontist's influence, patient's characteristics and compliance were all decisive in determining treatment time, while the effects provided by orthodontic appliances and methods used to speed tooth movement up seemed little effective. The present Nigerian study did not find any of the assessed dentists' demographic factors playing any significant role in their satisfaction level with the duration of active orthodontic treatment. According to Gabada et al [28], the protracted timeline associated with conventional orthodontic care has been a persistent concern for both patients and practitioners. In this comprehensive review, we embark on an exploration of innovative strategies aimed at expediting orthodontic tooth movement (OTM). By doing so, we aspire to curtail treatment duration and mitigate potential risks, ultimately culminating in an elevated and more fulfilling patient experience. Onyeaso and BeGole [29] found statistically significant associations between orthodontic treatment outcomes and pre-treatment age ($p = 0.010$), as well as between orthodontic treatment outcome and treatment time ($p = 0.035$).

Mitwally et al [30],in their review article, concluded that increasing knowledge and experience of the orthodontist might increase the level of satisfaction as it has been reported to reduce the treatment duration significantly. However, this should be accompanied by adequate patient compliance, which was also reported to be a significant predictor for prolonged treatment duration. The finding in this present first Nigerian and African study that the dentists with over 10years of practice had significantly better knowledge of the different methods of accelerated orthodontics seems to suggest that the senior dentists who are most likely to be consultants and senior registrars must have out of experience and further studies and readings come to have learnt of the accelerated orthodontics methods. It is important to note that not all the methods of accelerated orthodontics were indicated in the questionnaire for this investigation. A recent review by Gabada et al [28] put these methods or techniques of accelerated orthodontics into categories and subcategories as follows: Invasive techniques - Interseptal alveolar surgery (Distraction Osteogenesis), Conventional Corticotomy, regional

acceleratory phenomenon (RAP) or periodontally accelerated osteogenic orthodontics (PAOO)) (Wilckodontics); Minimally invasive techniques – piezocision and discision, microosteoperforation (alveocentesis); Non-invasive techniques (subcategory – Device-assisted treatments) – cyclic vibrations, low-level laser therapy (photobiomodulation), direct light electric current, and static or pulsed magnetic field), (subcategory – Biologic Approach) - systemic and local administration of biological substances and hormones such as Parathyroid hormone, prostaglandins, thyroxine, and calcitonin, relaxin, 1,25 dihydroxycalciferol (vit D3 or calciferol), Neurotransmitters; (subcategory – medications) – NSAIDS, Acetaminophen (paracetamol), corticosteroids, Bisphosphonates, Herbal medicine biomaterials (Asperosaponin VI), (subcategory – synthetic biomaterials) – Graphene oxide.

It is noteworthy that there is paucity of literature on impact or association of dentists or orthodontists' demographics with their views on duration of active orthodontic treatment or their knowledge of accelerated orthodontics for comparison with this present Nigerian study. However, Al-Attar et al [1] reported that both orthodontists and patients were interested in techniques that can decrease the treatment duration, and non-invasive accelerating procedures were more preferable by orthodontists and patients than invasive surgical procedures. The current Nigerian study has shown that male gender gave significant association with knowledge of administration of biological substances as well as with piezocision. Also, dentists with over 10 years of working experience in this present Nigerian study gave significant associations with the use of some medications orally locally, low level laser therapy, resonance vibration and corticotomies. According to Paul et al [31], most of the orthodontists were not very satisfied with the conventional orthodontic treatment time duration, and they were familiar and aware of the accelerated orthodontic procedures. However, these accelerated techniques were less adopted in their clinical practice possibly due to patient compliance, cost, invasiveness, complications, etc. The present Nigerian study did not find any significant associations between any of the demographic factors of the dentists and their satisfaction with duration of active orthodontic treatment.

Meanwhile, the findings of this present Nigeria study has affirmed the first null hypothesis, while the second hypothesis was accepted by age and partly accepted by gender because significant associations were found with respect to age and two out of the seven methods investigated, and much more by years of practice as dentists.

4.1 Strengths and Challenges of this present study

This present first Nigerian and African study on the impact or association of dentists' demographics on their satisfaction with conventional orthodontic treatment duration and their knowledge of the methods of accelerated orthodontics has the strength of originality, as well as the good representativeness of the study sample. As mentioned earlier, this study has the challenge of not having much previous literature for discussion and comparison of data.

5. CONCLUSIONS

1. No statistically significant association was found between the dentists' satisfaction with duration of orthodontic treatment and their age, gender and their years of practice as dentists.

2. No statistically significant association was found between the dentists' knowledge of the methods of accelerated orthodontics and their age.

3. Statistically significant associations were found between the male gender with knowledge of two methods of accelerated orthodontics – administration of biological substances and piezocision.

4. Much more statistically significant associations were found in relation to the number of years of practice of the profession – highest number of associations (three methods of accelerated orthodontics – low level laser therapy, resonance vibration and corticotomies) was found between the dentists who have practiced dentistry for over 10 years, followed by those who have been in practice between 6 and 10 years with one significant association for the use of some medications.

Consent

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

6. RECOMMENDATION

There is need to carry out similar studies in the dental community across the globe involving both the dental practitioners and the orthodontic patients for purposes of comparison of data, at least.

REFERENCES

1. Al-Attar AM, Al-Shaham S, Abid M. Perception of Iraqi Orthodontists and Patients toward Accelerated Orthodontics Int J Dent Vol 2021, Article ID 5512455, 7 pages https://doi.org/10.1155/2021/5512455

2. Abbing A, Koretsi V, Eliades T, Papageorgiou SN. Duration of orthodontic treatment with fixed appliances in adolescents and adults: a systematic review with meta-analysis. Prog Orthod 2020; 21(1): 1–11.

3. Unnam D, Singaraju GS, Mandava P, Reddy GV, Mallineni SK, et al. Accelerated Orthodontics– An overview. J Dent Craniofac Res 2018: 3(1):4

4. Nakhleh K, Joury E, Dean R, Marcenes W, Johal A. Can socioeconomic and psychosocial factors predict the duration of orthodontic treatment? Eur J Orthod 2020; (42(3): 263-269.

5. Mavreas D, Athanasiou AE. Factors affecting the duration of orthodontic treatment: A systemic review. Eur J Orthod 30(4): 386-95. DOI: 10.1093/ejo/cjn018

6. Moresca R. Orthodontic treatment time: can it be shortened? Dental Press J Orthod. 2018 Nov-Dec; 23(6): 90–105.doi: 10.1590/2177-6709.23.6.090-105.sar

7. Kihamehr Z, Razeghinejad HM, Rahbar M, Oskouel SG, Vafael A. Factors affecting the duration of fixed orthodontic treatment in patients treated in a University Department between 2016 and 2020. Maedica (Bucur). 2022 Jun; 17(2): 380–386. doi: 10.26574/maedica.2022.17.2.380

8. Uribe F, Padala S, Allareddy V, Nanda R. Patients', parents', and orthodontists' perceptions of the need for and costs of additional procedures to reduce treatment time. Am J Orthod Dentofacial Orthop. 2014; 145(4):S65–S73. doi:10.1016/j.ajodo.2013.12.015

9. Linjawi AI, Abushal AM, Al-Zahrani AM, Bakhamis BA. Patients' Perceptions To Reduced Orthodontic Treatment Time In Saudi Arabia. Patient Preference and Adherence 2019; 13: 1973–1981.

10. Kim Y. Study on the perception of orthodontic treatment according to age: a questionnaire survey. Korean J Orthod. 2017; 47(4):215–221. doi:10.4041/kjod.2017.47.4.215

11. Procedure Cost and Advantages of Accelerated Orthodontics in Toronto. Downtown Dentistry. Last accessed on March 23, 2023.

12. Kale S, Kocadereli I, Atilla P, Asan E. Comparison of the effects of 1, 25 dihydroxycholecalciferol and prostaglandin E2 on orthodontic tooth movement. Am J Orthod Dentofacial Orthop2004; 125(5): 607–614.

13. Varughese ST, Shamanna PU, Goyal N, et al. Effect of vitamin D on canine distalization and alveolar bone density using multi-slice spiral CT: a randomized controlled trial. J Contemp Dent Pract 2019; 20(12):1430–1435.

14. Iosub Ciur MD, Zetu, IN, Haba D, Viennot S, Bourgeois D, Andrian S. Evaluation of the influence of local administration of vitamin D on the rate of orthodontic tooth movement. Revista Medico ChirurgicalaSocietatii de Medici siNaturalisti din Iasi 2016; 120(3): 694–699.

15. Al-Hasani NR, Al-Bustani AI, Ghareeb MM, Hussain SA. Clinical efficacy of locally injected calcitriol in orthodontic tooth movement. Int J Pharm Pharmaceutical Sci 2011; 3: 139–143.

16. Mandall N, Lowe C, Worthington H, et al. Which orthodontic archwire sequence? A randomized clinical trial. Eur J Orthod 2006; 28(6): 561–566.

17. Davidovitch Z, Finkelson MD, Steigman S, Shanfeld JL, Montgomery PC, Korostoff E. Electric currents, bone remodeling, and orthodontic tooth movement. Am J Orthod 1980; 77(1): 33–47.

18. Stark TM, Sinclair PM. Effect of pulsed electromagnetic fields on orthodontic tooth movement. Am J Orthod Dentofacial Orthop 1987; 91(2):91–104.

19. Nishimura M, Chiba M, Ohashi T, et al. Periodontal tissue activation by vibration: intermittent stimulation by resonance vibration accelerates experimental tooth movement in rats. Am J Orthod Dentofacial Orthop 2008; 133(4): 572–583.

20. Imani M, GolshahSafariFaramani AR, Sadeghi M. Effect of low-level laser therapy on orthodontic movement of human canine: a systematic review and meta-analysis of randomized clinical trials. Acta Informatica Medica 2018; 26(2): 139–143.

21. Kawasaki K, Shimizu N. Effects of low-energy laser irradiation on bone remodeling during experimental tooth movement in rats. Lasers Surg Med 2000; 26(3):282–291.

22. Abdelhameed AN, Refai WMM. Evaluation of the effect of combined low energy laser application and microosteoperforations versus the effect of application of each technique separately on the rate of orthodontic tooth movement. Open Access Macedonian J Med Sci 2018; 6(11): 2180–2185.

23. Chen SH, Greenlee GM, Kim JE, Smith CL, Huang GJ. Systematic review of self-ligating brackets. Am J Orthod Dentofacial Orthop 2010; 137(6):

24. Eberting JJ, Straja SR, Tuncay OC .Treatment time, outcome, and patient satisfaction comparisons of Damon and conventional brackets. Clin Orthod Res vol. 4, no. 4, pp. 228–234, 2001.

25. Papageorgiou SN, Konstantinidis I, Papadopoulou K, Jager A, Bourauel C. A systematic review and meta-analysis of experimental clinical evidence on initial aligning archwires and archwire sequences. Orthod Craniofac Res. 2014 Nov; 17(4):197-215.doi: 10.1111/ocr.12048.

26. Umeh OD, Isiekwe IG, daCosta OO, Sanu OO, Utomi IL, Izuka M. Attitude and perception of orthodontic patients to orthodontic treatment time and accelerated orthodontics. Afr J Oral Health 2020; 9(2): 28-39.

27. Ututu C, Orikpete M, Okino BO, Okino CO,Onyeaso CO. Satisfaction with Duration of Orthodontic Treatment, Knowledge and Perception of Accelerated Orthodontics by Nigerian Dental Practitioners: A Questionnaire Study. Asian J Med Health 2023; 21(12): 1-11.

28. Gabada D, Reche A, Saoji K P, Deshmukh R, Rathi N, Manthri A. Accelerated Orthodontics: Stepping Into the Future Orthodontics. Cureus 2023; 15(10): e46824. DOI 10.7759/cureus.46824

29. Onyeaso CO, BeGole EA. Associations between pretreatment age and treatment time with orthodontic treatment outcome: A comparison by means of two orthodontic indices. Hellenic Orthod Rev. 2008; 11:9-11.

30. Mitwally RA, Alesawi LM, Arishi TQ, Humedi AY, Al Baaltahin SS, Saeedi YA et al. Factors affecting orthodontic treatment time and how to predict it. Int J Community Med Public Health 2022; 9(1): 1-5.

31. Paul A, Mongia JP, Kumar DA, Mahobia YK, Kupta S, Mukherjee M. Perception of orthodontists & post graduates regarding techniques to reduce orthodontic treatment duration: A prospective questionnaire study. Int Dent J Student's Res 2021; 9(3): 129-132.

APPENDIX

QUESTIONNAIRE ON ACCELERATED ORTHODONTICS

Please, we need your help to respond to the questions below. This is purely for academic purposes and your responses will be confidentially handled. Questions 7 and 8 are for Orthodontists or orthodontic residents only. Please, provide honest responses as much as possible. Thank you.

SECTION A (Please, tick your choice out of any of the options)

(1)Age ----- (2) Gender: Male / Female (3) Duration of Practice ------- (4) Specialty. ----------

(5) Qualification: (a) BDS only (b) Part I or Membership/Masters (c) Fellowship

SECTION B

(6) Are you satisfied with the duration of active orthodontic treatment for patients?

(a) very satisfied (b) somewhat satisfied (c) neutral (d) somewhat dissatisfied (e) very dissatisfied

(7) Which of these do you know form(s) part of accelerated orthodontics?

Procedure	**Yes**	**No**
Use of some medications injected locally intraoral:		
Administration of Biological Substance and Hormones (local or systemic):		
Direct Light Electric Current-electric current application of about 20 μA for 5 h daily:		
Low Level Laser Therapy (LLLT):		
Resonance Vibration:		
Corticotomies:		
Piezocision:		