Surveys of Current Teaching and Practice for Impressions for Complete Dentures

Keywords

Prosthodontic
Denture
Impression
General Dental Practice
Removable Prosthesis

Authors

Dr. Naveed Hussain [§]
(BChD, MChD, BSc)

Dr. Hummaid Jabbar *
(BChD, MChD, BSc)

Dr. Mohammed Hayati ^
(BChD, MChD, BSc, MFD (RCSI))

Dr. Jianhua Wu [ǂ]
(MSc, PhD)

Dr. T Paul Hyde [ǂ]
(BChD, PhD, DGDP RCS (Eng), MGDS RCS(Eng), FHEA)

Address for Correspondence

Dr. T Paul Hyde [ǂ]

Email: t.p.hyde@leeds.ac.uk

[ǂ] *University of Leeds*

[§] *General Dental Practitioner, 11 Broomfield Road, Marsh, Huddersfield, UK*

* *General Dental Practitioner, 137 Lonsdale Street, Bradford, UK*

^ *General Dental Practitioner, Sha'ab, Block 1, St. 14 , House 4 , Kuwait*

Received: 16.08.2017
Accepted: 17.01.2018

doi: 10.1922/EJPRD_01749Hussain08

ABSTRACT

Objectives: The 3 objectives are to assess current preferences for impressions for complete dentures, audit practice and compare practice to current UK teaching. Methods: Three surveys where undertaken; a survey of GDPs preferences, an audit of practice and a survey of teaching in UK dental schools. Results: UK Universities advocate border moulded custom trays. In stated preferences, 99% of practitioners used custom trays for private practice; 67% for NHS work. In actual use, the audit found 91% practitioners in private practice used custom trays; in NHS practice 78% did so. The most widely taught materials were silicone (43%), alginate (29%), & zinc oxide eugenol paste (19%). In practitioners stated preferences, 97% of NHS and 53% of private dentists listed alginate as an option; however the audit showed only 74% (NHS) and 52% (private) actually used alginate, with 20% (NHS) and 48% (private) using silicone. Conclusions: Definitive impressions in custom trays are used by GDPs for both private and NHS work; they are universally taught at UK dental schools. Alginate is popular in NHS practice; however, silicone is more widely taught in UK Universities. The use of silicone materials for definitive impressions has increased since 1999. In UK private practice silicone usage is aligned in popularity with alginate.

INTRODUCTION

Within the academic dental literature, there has been a debate on impression materials and techniques for complete dentures for over a century. The first material flexible enough to be removed undistorted from undercuts was the colloid agar-agar.[1] New materials and techniques have since increased the choice available to General Dental Practitioners (GDPs), but the changes in practice have been slow and were often the subject of fierce historic academic debate.[2-8] As Boucher stated in 1951, "There are far too many impression techniques to consider each one separately"; however his critical overview of twentieth century impression techniques is still relevant today.[9] In this century, surveys showed the contemporary list of possible impression materials now encompasses polyvinylsiloxanes (silicones), irreversible hydrocolloids (alginates), zinc oxide/eugenol, polysulphides, and polyethers.[10-12]

Much of the historical debate over the choice of the techniques used for impressions centred on the pressure generated by or distributed within the impression. Mucodisplacive, mucostatic, differential pressure and functional impression techniques have been advocated through the decades.[2,3,4,7,13] The published papers were often argued from first principles in the rhetorical style of the period, often without accompanying experimental evidence or clinical studies.[2,4,7,14]

It is only with the development and application of the methodology of Randomised Controlled Trials (RCTs) that an adequate clinical research tool has become available for a comparison to be made between impression materials and techniques. The systematic reviews of Jokstad and of Harwood showed that at the time they were published, earlier this century, there still remained a particular paucity of high quality RCTs.[15,16] Within this century, before RCT methodology was applied to this topic, General Dental Practitioners (GDPs) lacked sound clinical evidence for best practice. Surveys of dentists' current practice attempted to fill this knowledge gap by providing peer opinion on current practice. [17-19]

The historical lack of RCT research was highlighted by Carlsson who, in 2006, went on to state "it is not probable that comparisons between dentures made with varying impression materials and methods would lead to significant differences in clinical long term results".[20] At that time it was clearly felt this would be a difficult area to undertake RCT's and indeed subsequent parallel sided protocols have repeatedly failed to differentiate between the 2 sides of clinical trials involving complete denture impressions.[21-24]

It is worth noting here the particular difficulties with denture impression trials that Carlsson[20] alludes to. The difficulties are due to the unusually high number of confounding variables[25]. In denture trials, parallel sided protocols can allow multiple, often uncontrolled, co-variants which are capable of influencing the dependant variable. The problem for a trial with numerous confounders, is that a Stratified Randomization protocol would require very large numbers of participants, but a traditional Block Randomisation results in uneven distribution for at least some of the potential confounders. A potential solution for parallel sided denture trials could be Covariate Adaptive Randomization; however this methodology has not yet been applied within published trials. Fortunately a more elegant solution to this problem can be found in the use of a cross over protocol which eliminates many of the problematic confounding variables.[25]

The repeated failure of block-randomised parallel-sided trials [21-24] to detect a difference may be because there is no real difference or because these parallel sided protocols were incapable of detecting any difference; absence of proof is not proof of absence[26]. In contrast those RCTs of denture impressions which have successfully detected a difference between the 2 sides of the trial, have invariably used a cross over design.[27-30]

The evidence from the successful RCTs has the potential to change practice; however, a question remains over the impact of such RCT evidence on both current teaching and GDP practice. An objective of this study was to investigate if practice has changed since a baseline was established in 1999.[19] The evidence for change was gathered by repeating the questionnaire survey that was first carried out in 1999.[19]

In order to further investigate the current practice of those practitioners who did not respond to the questionnaire and to audit the replies of those who did respond, a structured examination of impressions at dental laboratories was also undertaken.

Alongside the GDP questionnaire and the dental laboratory audit, a survey of the current UK dental school teaching on this subject was undertaken to investigate contemporary recommendations.

The primary research question is "What is the contemporary practice for impressions for complete dentures in GDP in the UK?" Secondary research questions are "Has practice changed since 1999", "Do GDPs practice as they report in the returned questionnaires?" and "Does current practice align with current teaching?"

MATERIAL AND METHODS

Three surveys were initiated. First, a survey of GDPs to establish the stated preferences of practitioners. Secondly, an audit within dental laboratories to establish current practice of GDP's. Thirdly, a survey of the teaching on the subject in UK dental schools.

SURVEY OF GDP'S REPORTED PRACTICE

The questionnaire from Hyde and McCord's survey published in 1999 was re-formatted and sent to 475 General Dental Practitioners. The format change allowed the questions to be asked separately for dentures made under the UK National Health Service (NHS) financial contract and dentures made by private funding (i.e. financed directly by the patient). The questions asked are listed in Table 1. The selection of GDPs was generated from the UK General Dental Council published lists. The questionnaires were posted out to all GDPs in the Yorkshire area. A self-addressed and stamped envelope was included for the return of the questionnaires.

SURVEY OF GDP'S PRACTICE BY AUDITING THEIR WORK WITHIN DENTAL LABORATORIES

7 Dental Laboratories who were known to have a large prosthetic workload were contacted. 5 Dental Laboratories consented to a visitation and were visited to collect data. A structured examination of the impressions was undertaken using a pre-formed data collection sheets.

SURVEY OF CURRENT TEACHING

A questionnaire was drawn up and piloted at the University of Leeds. After editing, the consolidated questionnaire was sent to the head of each prosthodontics/restorative department in the 16 undergraduate dental schools in the UK. The questionnaire comprised of 10 questions regarding the teaching of complete denture definitive impressions in the undergraduate curriculums (see Table 2).

Table 1. Survey of Dentists' preferences (where there are listed options, more than one answer was allowed)

Questions	Response Options	NHS contract % of those eligible* (n)	Private Contract % of those eligible* (n)	P-value of differences between NHS and private contract
Do you routinely provide complete (full) dentures in the normal course of your NHS practice?	Yes	79% (181)	-	
	No	21% (48)		
Do you routinely provide complete (full) dentures in the normal course of your Private practice?	Yes	-	65% (148)	
	No		35% (81)	
Which of the following materials would you routinely use for NHS primary impressions?	Alginate	97% (176)	61% (90)	< 0.001
	Silicone	5% (9)	13% (19)	
	Compound+/-alginate	9% (17)	32% (48)	
	ZnO	2% (3)	3% (5)	
	Plaster	<1% (1)	1% (2)	
Do you routinely use laboratory constructed special trays to take NHS definitive impressions?	Yes	67% (121)	99% (146)	< 0.001
	No	33% (60)	1% (2)	
If yes, which type of special tray do you routinely ask for?	spaced perforated	46% (56)	51% (74)	0.499
	close fitting perforated	33% (40)	33% (48)	
	close non-perforated	18% (22)	13% (19)	
	spaced non-perforated	2% (3)	5% (7)	
Regarding your special tray prescription, do you specify the type of handles?	protruding handles	47% (57)	50% (73)	0.989
	stub handles	43% (52)	42% (66)	
	No handles	<1% (1)	<1% (1)	
Which of the following materials would you use in a special tray for the definitive impression?	Alginate	97% (118)	53% (77)	< 0.001
	Silicone	7% (9)	50% (73)	
	ZnO	6% (7)	9% (13)	
	Other	9% (11)	20% (29)	
What percentage of your practice is private?	Less than 25% private dentistry	55% (125)		
	25% - 50% private dentistry	11% (25)		
	50% - 75% private practice	5% (12)		
	75% - 100% private dentistry	29% (67)		

*these results are the percentage of those dentists who are eligible to answer each question. There were a total of 229 responders, eligible in the first two rows of the table. For the question on primary impressions there were 181 eligible dentists under the NHS contract column and 148 eligible dentists in the private contract column. For the questions related to custom trays and secondary impression, 121 dentists were eligible in the NHS column and 146 in the Private contract column. Where the dentists have given multiple answers to a question each answer has been counted and included in the figures represented in the table.

Table 2. Survey of teaching in UK dental schools

Questions	Response Options	Response % (n)
Are you teaching students to use a special (custom) tray to obtain the definitive impressions of edentulous arches?	Yes	100% (12)
	No	0% (0)
What material is used for the construction of special (custom) trays?	light cured acrylic resin	83% (10)
	cold curing acrylic resin	17% (2)
Are students taught to use stops in the special (custom) trays?	adding stops during the construction	41% (5)
	add stops at the chairside	17% (2)
	add stop at chairside if the lab fails to add them	17% (2)
	No (do not teach adding stops)	25% (3)
Are students taught to place vent holes in the special (custom) trays?	Yes	25% (3)
	No	75% (9)
What material is used for border moulding of the definitive impressions' trays?	Tracing compounds" only	67% (8)
	Tracing compounds or high viscosity silicone	33% (4)
Are you teaching students to use a spaced or a close fitting special (custom) tray?	Spaced (1-3mm)	41% (5)
	Close fitting	17% (2)
	Other (open answers giving specific 2+ options)	41% (5)
What materials are taught for the definitive impression for complete dentures?	Alginate; Addition cured silicone rubbers	33% (4)
	Addition cured silicone rubbers; ZnO eugenol	25% (3)
	Alginate; Condensation cured silicone	8% (1)
	Addition cured silicone rubbers; Polyethers	8% (1)
	Alginate only	8% (1)
	Addition cured silicone rubbers only	8% (1)
	Zinc-Oxide eugenol paste only	8% (1)
Which impression technique is taught for obtaining the definitive impression of the edentulous arch?	Low pressure (relatively mucostatic)	58% (7)
	High pressure (mucodisplacive) technique	8% (1)
	Other (open answer)	34% (4)
Are students taught the closed-mouth or open-mouth technique to obtain the final working impression of the edentulous arch?	Open-mouth	66% (6)
	Closed-mouth	17% (2)
	Other (open answer)	17% (2)
Please could you give a succinct explanation of the teaching at your institute on impressions for complete dentures?	Open answer	N/A

For the questionnaire completed by GDPs and the audit within dental laboratories the differences between NHS contracts and private contracts were analysed for statistical significance. Fisher exact test was used in the analysis of binary results and Chi squared test for questions where multiple results were possible.

RESULTS

SURVEY OF GDP'S REPORTED PRACTICE

The response rate from the survey was 49% with a total of 229 questionnaires returned. Where multiple answers to individual questions were received, each answer was included and counted. The results are shown in Table 1. There were highly significant differences between dentists working under an NHS contract and those working under a private contract (see p values in Table 1).

In the answer to the questions on definitive impression materials (see Figure 1) respondents often mentioned more than one option; it is therefore particularly interesting to look at what dentists actually use by observing the impressions that they sent to commercial dental laboratories in the results below.

SURVEY AT DENTAL LABORATORIES AUDITING ACTUAL PRACTICE

73 complete denture impressions were inspected. 50 of these impressions were made on the NHS, 23 of the impressions were carried out on a private basis.

The different materials used for definitive impressions are indicated in Figure 2. It is useful to compare these results to similar results from the questionnaire survey *(Figure 1)*; see discussion section for comment.

For the final impression (the definitive impression for the denture) 78% (39 out of 50) of impressions from NHS practices were taken with custom trays ('special trays') compared to 91% (21 out of 23) impressions from private practices. This corresponds to an overall usage of custom trays and secondary impression in 82% of all cases. Of those cases who used custom trays, 81% (n=59) of custom trays were spaced with stops (this is the combined figure for NHS and private practices) the rest were close fitting.

In private practices, 48% (n=11) of secondary (custom tray) impressions were taken with silicone and 52% (n=12) taken with Alginate. This contrasts with impressions from NHS practices where 20% (n=10) of secondary (custom tray) impressions taken with silicone, 74% (n=37) were taken using alginate and 6% (n=3) taken using Zinc Oxide Eugenol. Chi-square test yielded a highly significant difference ($p<0.001$) between NHS practice and private practice in the materials used for secondary impressions.

57% (n=13) of impressions from private practices were border moulded with a separate material from the definitive impression, compared to 42% (n=21) of impressions from NHS practices.

Voids were present in 61% (n=14) of impressions from private practices and 52% (n=26) of impressions from NHS practices.

SURVEY OF CURRENT TEACHING

12 of the 16 undergraduate dental schools responded, providing a response rate of 75%. All respondents (100%) agreed on teaching students to use custom trays for obtaining definitive impressions. The majority (83%) of schools reported using Visible Light Cured (VLC) acrylic resin for construction of custom trays. All schools (100%) taught students to border mould the custom tray with a separate material before the definitive impression; tracing compounds were always an option with 67% of schools using only tracing compounds for border moulding.

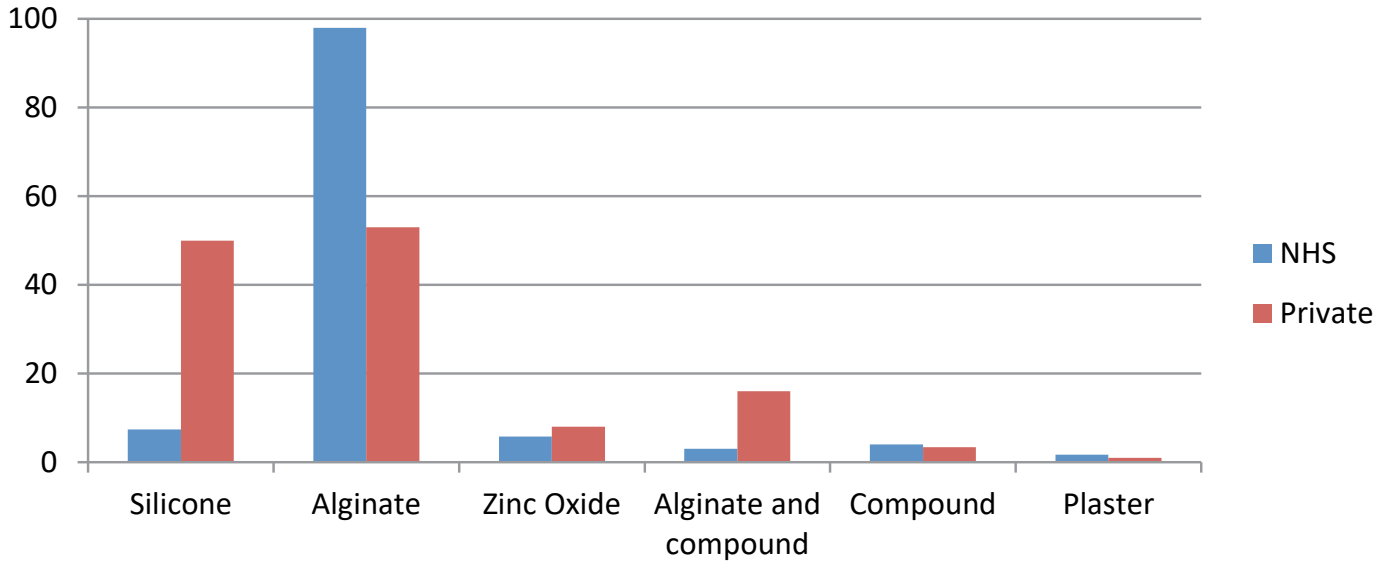

Figure 1: Differences in GDP choices between NHS and private contract impression materials for definitive impressions for complete dentures (multiple answers possible)

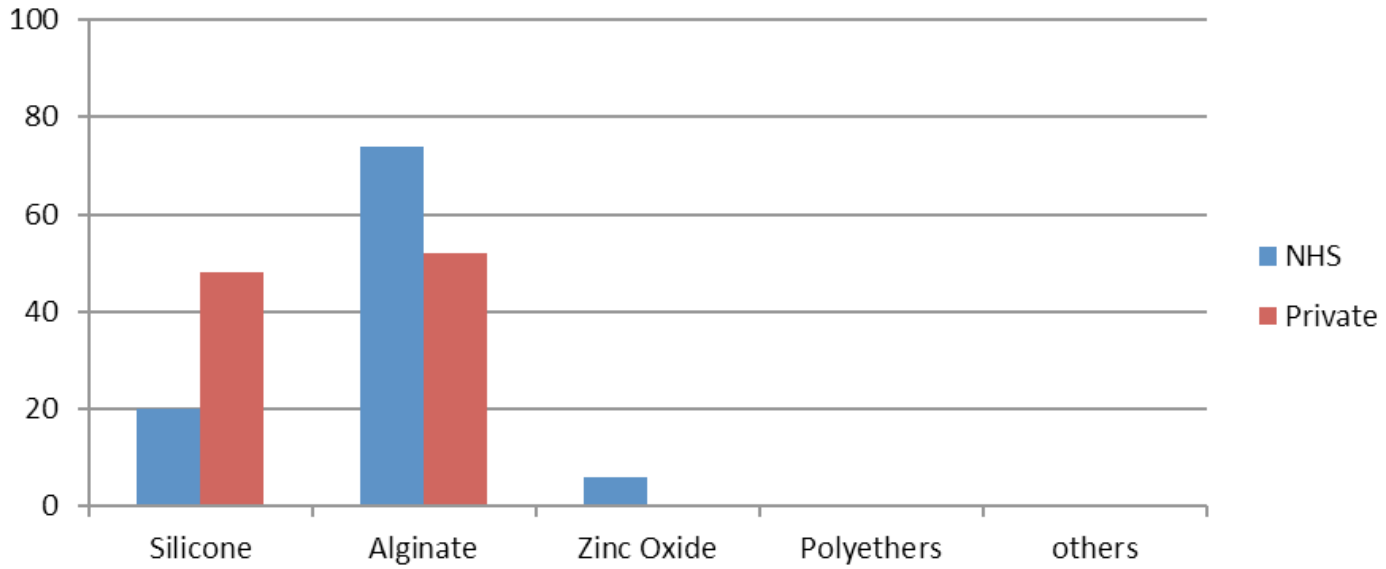

Figure 2: Laboratory audit of impression materials actually used for definitive impressions.

The majority of schools agreed on teaching students to use a spaced tray if using alginate or silicone, and to use a close fitting tray if using zinc oxide eugenol paste. The most widely reported impression material taught was addition cured silicone (43%), followed by alginate (29%) and zinc oxide eugenol paste (19%); more than one option could be selected in the questionnaire. 6 (50%) Schools included alginate as an option, 8 (67%) included either addition cured or condensation cured silicone as an option. 75% of schools did not include vent holes (perforations) in the fabrication of custom trays, while a minority (25%) of schools did advocate perforations (see Table 2).

DISCUSSION

The use of surveys to investigate current practice has potential validation issues. Bias may be introduced with "demand characteristics" where practitioners may give the answer that they believe to be 'correct' rather than a true reflection of their current practice. Questions may also be raised over the issue of non-respondents to questionnaires. It cannot be assumed that non-respondents views are identical to those given by dentists who have responded. For example the responders maybe the keen, knowledgeable practitioners and the non-responders may be less responsible practitioners, or vice-a-versa. This is particularly a problem where the response rate to the questionnaire is low. In this study the response rate was 48%. The addition of the independent audit of current practice within dental laboratories addresses this issue. The correlation between the questionnaire survey and the laboratory audit confirms both the veracity of the questionnaire answers and practice of the non-responders.

Although 21% of dentists did not provide complete dentures under the NHS contract and 35% do not provide dentures under a private contract *(Table 1)*; in the UK it is normal for GDPs to offer a two tier practice. Dentures are available at the majority of dental practices under either the fixed price NHS contract or under a private contract (at a higher cost to the patient). Dentists are able to offer a choice to their patients, with an enhanced product available at an increased price. Differences in the options for impressions between the NHS dentures and the private dentures may therefore reflect those changes that the dentists believe will increase the quality of the end product when price is less restricted. It is therefore pertinent to examine the differences between NHS and private practice to understand what dentists believe will increase the quality of the final denture.

For example, there is a distinct difference in the preferences for custom trays between NHS contracts (67%) and private contracts (99%). The audit in dental laboratories, showing the actual use of custom trays, broadly correlates with these figures indicating a custom tray usage of 78% for NHS contracts and 91% for private contracts. This would indicate that when dentists wish to increase the quality of dentures for their private patients, a greater proportion of the dentists choose to use custom trays. This aligns with the recommendation to use custom trays for secondary definitive impressions by all the surveyed UK dental schools. Thus the study has found that experienced GDPs assume and academic leaders teach that custom trays improve the quality of dentures; this alignment of practice and expectation is clear and gives an important insight to best practice.

Both the laboratory audit results and the results of the questionnaire confirm that the use of custom trays for NHS and private contracts, continues to be normal practice among the clear majority of UK GDPs despite the additional cost of the custom tray. The number of dentists using custom trays has increased dramatically from a similar audit by Basker in 1993.[31]

For both the 1999 and the 2016 surveys of GDP preferences, multiple answers were possible for the questions on the materials used for impressions. This complicates interpretation of the results from the questionnaire. The addition of the laboratory audit in 2016 clarifies the actual use by GDP's, strengthening the results.

The splitting of the 2016 questionnaire into private and NHS contract makes direct comparisons with the 1999 survey problematic. With the benefit of hindsight this issue should have been addressed before sending out of the questionnaire. Notwithstanding this issue, it is safe to say that in 1999 the dentists' preferences were heavily in favour of alginate with 94% of the responders giving alginate as an option for definitive impressions, whereas in 2016 results from both the questionnaire of preferences and the laboratory audit indicate a decrease in the usage of alginate and an increase in the use of silicone. In 2016 in the laboratory audit only 67% (49) of all the definitive impressions examined were taken in alginate with 29% (21) taken with silicone and 4% (3) taken in zinc oxide eugenol.

The increase in the use of silicone for private dentures compared to NHS dentures, indicates that when dentists wish to improve the quality of their impressions they are more likely to use silicone as their impression material. Thus the survey suggests that experienced GDPs assume that the use of silicone for definitive secondary impressions improves the quality of the dentures that they produce. Academic teachers teach silicone and we can speculate this is because they believe it produces superior dentures.

Contemporary teaching and the changes in primary care practice since 1999 align with the results from recent cross over RCT's.[27,30] Thus indicating the impact of research at primary care level.[27,30]

The clinical implications of these surveys are that despite their expense, custom trays and secondary impressions are the stated preferred option of GDPs for their definitive impression for complete dentures. The audit reported here shows how they are routinely used by dentists constructing complete dentures in the UK. In UK dental schools, teaching has moved towards silicone as the preferred material for definitive impressions for complete dentures. Although in primary care alginate still dominates the market for definitive impressions, silicone has increased in popularity since 1999; this is particularly so in UK private practice.

CONCLUSIONS

Definitive impressions in custom trays are the preferred option of choice for complete dentures under both private and NHS contracts in the UK. Border moulded custom tray impression are universally taught at UK dental schools. Alginate still dominates the market for definitive impressions in NHS practice. However, silicone has become the material that is most widely taught within the UK dental schools. The overall usage of silicone materials for definitive impressions has increased since 1999. In private practice silicone usage is now aligned in popularity to the use of alginate for definitive impressions by UK GDPs.

CLINICAL SIGNIFICANCE

GDPs state they prefer custom trays and secondary impressions for complete dentures; audit shows they are routinely used. In UK Universities, teaching has moved towards silicone for definitive impressions. GDP's often use Alginate for definitive impressions, but silicone use has increased since 1999; this is particularly so for private contracts.

REFERENCES

1. Lufkin AW. 1948. A History of Dentistry. London, Henry Kimpton.
2. Stansbury CJ. The negative pressure method of impression taking. *J Am Dent Assoc* 1925;**12**:438.
3. Fournet SC, Tuller CS. A revolutionary mechanical principle utilized to produce full lower dentures surpassing in stability the best modern upper dentures. *J Am Dent Assoc* 1936;**23**:1028-30.
4. Addison PI. Mucostatic impressions. *J Am Dent Assoc* 1944;**31**:941-946.
5. Page HL. Mucostatics-a principle, not a technique. 1946; Chicago, Ruggles Press.
6. Lytle RB. The Management of Abused Oral Tissues in Complete Denture Construction. *J Prosthet Dent* 1957;**7**:27-42.
7. Chase WW. Tissue conditioning utilizing dynamic adaptive stress. *J Prosthet Dent* 1961;**11**:804-15.
8. Vig RG. A modified chew-in and functional impression technique. *J Prosthet Dent* 1964;**14**:214-220.
9. Boucher CO. A critical analysis of mid-century impression techniques for full dentures. *J Prosthet Dent* 1951;**1**:472-91.
10. Hyde TP, McCord JF. Survey of prosthodontic impression procedures for complete dentures in general dental practice in the United Kingdom. *J Prosthet Dent* 1999;**81**:295-9.
11. Petrie CS, Walker MP, Williams K. A Survey of U.S. Prosthodontists and Dental Schools on the Current Materials and Methods for Final Impressions for Complete Denture Prosthodontics. *J Prosthodont* 2005;**14**:253-262.
12. Petropoulos VC, Rashedi B. Current Concepts and Techniques in Complete Denture Final Impression Procedures. *J Prosthodont* 2003;**12**:280-287.
13. Lee RE. Mucostatics. Dent Clin North Am1980;**24**:81-96.
14. Page HL. Mucostatics- a capsule explanation. *Chronicle of the Omaha District Dental Society* 1951;**14**:95-196.
15. Jokstad A, Esposito M, Coulthard P, Worthington HV. The Reporting of Randomized Controlled Trials in Prosthodontics. *International J Prosthodont* 2002;**15**:230-242.
16. Harwood CL. The evidence base for current practices in prosthodontics. *Eur J Prosthodont Restor Dent* 2008;**16**:24-34.
17. Petrie CS, Walker MP, Williams K. A Survey of U.S. Prosthodontists and Dental Schools on the Current Materials and Methods for Final Impressions for Complete Denture Prosthodontics. *J Prosthodont* 2005;**14**:253-262.
18. Petropoulos VC, Rashedi B. Current Concepts and Techniques in Complete Denture Final Impression Procedures. *J Prosthodont* 2003;**12**:280-287.
19. Hyde TP, McCord JF. Survey of prosthodontic impression procedures for complete dentures in general dental practice in the United Kingdom. *J Prosthet Dent* 1999; **81**:295-9.
20. Carlsson GE, Facts and fallacies: an evidence base for complete dentures. *Dent Update* 2006;**33**:134-42.
21. Kawai Y, Murakami H, Shariati B, Klemetti E, Blomfield JV, Billette L, Lund JP, Feine JS. Do traditional techniques produce better conventional complete dentures than simplified techniques? *J Dent* 2005;Sep:659-68.

22. Nuñez MC, Silva DC, Barcelos BA, Leles CR. Patient satisfaction and oral health-related quality of life after treatment with traditional and simplified protocols for complete denture construction. *Gerodontology* 2015;**32**:247-53.
23. Omar R, Al-Tarakemah Y, Akbar J, Al-Awadhi S, Behbehani Y, Lamontagne P. Influence of procedural variations during the laboratory phase of complete denture fabrication on patient satisfaction and denture quality. *J Dent* 2013;**41**:852-60.
24. Regis RR, Cunha TR, Della Vecchia MP, Ribeiro AB, Silva-Lovato CH, de Souza RF. A randomised trial of a simplified method for complete denture fabrication: patient perception and quality. *J Oral Rehabil* 2013;**40**:535-45.
25. Gray JC, Navarro-Coy N, Pavitt SH, Hulme C, Godfrey M, Craddock HL, Brunton PA, Brown S, Dillon S, Dukanovic G, Fernandez C, Wright J, Collier H, Swithenbank S, Lee C, Hyde TP. IMPROVDENT: improving dentures for patient benefit. A crossover randomised clinical trial comparing impression materials for complete dentures. *BMC Oral Health* 2012;**12**:37
26. Altman DG, Bland JM. Absence of evidence is not evidence of absence. *BMJ* 1995;**311**:485.
27. Jo A, Kanazawa M, Sato Y, Iwaki M, Akiba N, Minakuchi S. A randomized controlled trial of the different impression methods for the complete denture fabrication: Patient reported outcomes. *J Dent* 2015;**43**:989-96.
28. Hyde TP, Craddock HL, Blance A, Brunton PA. A cross-over Randomised Controlled Trial of selective pressure impressions for lower complete dentures. *J Dent* 2010;**38**:853-8.
29. McCord JF, McNally LM, Smith PW, Grey NJ. Does the nature of the definitive impression material influence the outcome of (mandibular) complete dentures? *Eur J Prosthodont Restor Dent* 2005;**13**:105-8.
30. Hyde TP, Craddock HL, Gray JC, Pavitt SH, Hulme C, Godfrey M, Fernandez C, Navarro-Coy N, Dillon S, Wright J, Brown S, Dukanovic G, Brunton PA. A randomised controlled trial of complete denture impression materials. *J Dent* 2014;**42**:895-901.
31. Basker RM, Ogden AR, Ralph JP. Complete denture prescription—an audit of performance. *BDJ* 1993;**174**:278-84.