

An Audit into Metal Denture Frameworks That Require a Laboratory Remake at Birmingham Dental Hospital



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Introduction

- Metal Denture Frameworks (MDF) are more expensive to construct than acrylic dentures, however, offer significant clinical advantages
- MDFs are a commonly made dental prosthesis, with more than 66,000 metal based dentures being made by GDPs in England 2019/20¹
- MDF remakes have financial, clinical and treatment provision implications

Aim

Identify the reasons for MDF remakes in order to minimise the incidence of MDF remakes

Standard

< 10% of all MDFs should be remakes

Methodology



2 cycle retrospective audit



Data collection from on-site laboratory and clinical records

Cycle:



1 = 1st January-30th June 2017

2 = 1st April-30th September 2019

Implemented Changes

1. **5-Day Stable Alginate** – explore its utility in clinical and laboratory processes
2. **Clinical Proforma** – to record the MDF fit assessment in the clinical records
3. **Reinforce Disinfection Protocols** – include chairside timers to prevent impression warping
4. **Impression Quality Check** – prior to casting MDF
5. **Disseminate Findings** - at Clinical Governance meetings and within undergraduate education

Results

Category Investigated		First Cycle	Second Cycle
MDF	Total	265*	186*
	Remakes	33 (12.5%)	25 (13.4%)
Data below based on clinical notes:		n=32	n=22
Clinician	BDS	21 (66%)	12 (55%)
	DCT	4 (12%)	5 (22.5%)
	StR	5 (16%)	5 (22.5%)
	Associate Specialist	2 (6%)	0 (0%)
Denture Type	Upper	19 (59%)	9 (41%)
	Lower	13 (41%)	13 (59%)
Tooth Preparation	Yes	15 (47%)	19 (86%)
	No	13 (41%)	3 (14%)
	Not Documented	4 (12%)	0 (0%)
Impression Material	Alginate	27 (84%)	20 (91%)
	Silicone	5 (16%)	1 (4.5%)
	Polyether	0 (0%)	1 (4.5%)
Stage Remake Decision	MDF Try In	25 (78%)	22 (100%)
	MDF & Wax Try In	6 (19%)	0 (0%)
	Delivery	1 (3%)	0 (0%)

* No. excluded due to no clinical notes: First Cycle n=1, Second Cycle n=3

Days from Impression to Try In (Mean, Range):
 Cycle 1 34, 14-114
 Cycle 2 37, 14-195

- Total of 58 remakes in 12 month period
- Students accounted for 57% remakes
- Alginate most frequently used impression material requiring a remake (81% cases)

REASONS FOR MDF REMAKE



Discussion



Material manipulation, storage temperature and humidity, disinfection protocol and rapid pour up must be considered to minimise alginate distortion due to the poor dimensional stability of the alginate gel phase².



Students make the majority of primary MDFs which may explain why they have the highest number of remakes. Less dentures were made in the second cycle which could be accountable to the undergraduate BDS programme holidays.



Remakes cost the trust £2,900 across the 2 cycles. This is a suspected underestimate due to patients who had more than two remakes not being identified within a 6 month cycle.



Excellent laboratory communication is crucial to ensure accurate MDF prescriptions; Barsby and Schwarz³ found only 50% of the laboratories provided a casting which conformed to the prescription.

Conclusion

- Regular revalidation of implemented changes to ensure minimisation of MDF remakes and ensure optimum patient care
- Recommend further research to be conducted to identify clinical factors that significantly increase the incidence of MDF remakes

References

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3. Barsby M, Schwarz W. The qualitative assessment of cobalt chromium castings for partial dentures. *British Dental Journal.* 1989; 166: 211-216

