

Removable prosthodontic services, including implant-supported overdentures, provided by dentists and denturists

J. G. EGAN*, A. G. T. PAYNE† & W. M. THOMSON‡ **Department of Oral Rehabilitation, †Oral Implantology Research Group, Sir John Walsh Research Institute and ‡Oral Implantology Research Group, Sir John Walsh Research Institute, School of Dentistry, The University of Otago, Dunedin, New Zealand*

SUMMARY The aim of this study was to evaluate the provision of removable prosthodontic services, including implant-supported overdentures, by dentists and denturists. A structured questionnaire was mailed to 474 randomly chosen dentists and 156 denturists registered to practise in New Zealand. Information was sought on the range of removable prosthodontic services provided (including implant-supported overdentures) and the professional fees charged for them. From 410 respondents, there was an overall response rate of 67.43%; 290 came from the dentists (males 78.6%, $n = 228$; females 21.48%, $n = 62$) and 120 from denturists (males 91.7%, $n = 110$; females 8.3%, $n = 10$). Most respondents were over 40 years of age, with one in three denturists (but only one in seven dentists) over 60 years of age. The extent of removable prosthodontic services varied. One-third of dentists referred complete denture patients and denturists referred a similar number of immediate denture cases. Denturists' complete denture, immediate denture and single reline prices were generally lower than those from

dentists. Removable partial denture prices were similar. Implant-supported overdentures were recommended for edentulous patients by one-third of the dentists and three out of four denturists. Forty per cent of denturists (but only 10% of dentists) charged <NZ\$1000 for complete dentures. (1NZ\$ = US\$ 0.75; 1NZ\$ = € 0.56; 1NZ\$ = GBP 0.38) Implant-supported overdenture fees were predominantly in the range of NZ\$1500–3000 for both groups, but one in four dentists and one in six denturists charged more than NZ\$3000. Although both denturists and dentists both provide prosthodontic services, there is a professional fee differential between them. Denturists' lower fees provide a more economic option. Denturists are likely to steadily develop further inroads into the implant-supported overdenture market.

KEYWORDS: prosthodontic services, denturism, implant-supported overdentures

Accepted for publication 4 July 2007

Introduction

Denturism can be defined as the fabrication and delivery of removable complete and partial dentures by non-dentists directly to the public. Known most commonly internationally as 'denturists', they are also known as clinical dental technicians (in the UK and New Zealand) and dental prosthetists (Australia). Training in New Zealand is via a university-based 1-year post-graduate diploma, with an entrance requirement of needing to be qualified for 2 years

beforehand as a dental technician. Clinical dental technicians in New Zealand are registered to deal directly with the public in fabricating, repairing and inserting removable complete dentures for edentulous patients, but only when there is no diseased or unhealed denture-bearing mucosa. They also fabricate, repair and insert removable partial dentures, but only after an oral health certificate for the patient has been obtained from a dentist.

Some countries, including New Zealand, permit denturists to undertake 'additional scopes' of activities,

including implant-supported overdentures. In New Zealand, this becomes possible after presenting to the registration council a competency related to completing at least eight documented cases of patients with implant-supported overdentures, guided by a suitably qualified prosthodontist, oral surgeon, periodontist or general dentist. These clinical dental technicians can make and repair implant-supported overdentures, but only on prescription of a dentist or dental specialist who is responsible for the final insertion and the patients' clinical care outcomes. Clinical dental technicians supply surgical guides for proposed implant positions to the oral surgeons, periodontists and general dentists when they place the implants for the denturists.

Since its first legal recognition in Canada in 1961, the profession of denturism has developed and grown, not only in terms of the number of practitioners, but also in terms of its expanding scope of practice. Where they are permitted to practise, denturists' activities tend to be closely regulated, albeit with some international differences. Denturists have provided a popular service to the public in Canada, Finland and Denmark (1). Competition between dentists and denturists in British Columbia, Canada has inevitably curtailed the rising cost to the public of dentures (2, 3), and a similar phenomenon was observed in the USA when denturism was legalized in 1978 (4). Tuominen (5) found that denturists in Finland tended to treat people from lower socio-economic status (SES) groups; moreover, there was no correlation between the level of patient satisfaction and the price paid for denture-related treatment. Hazelkorn and Christoffel (6) argued that the introduction of denturism internationally would enhance denture care because of its more cost-effective service. This assumption is based on the theory that, at the lower price offered by denturists, more people in low SES groups would be able to access denture treatment. Gerughty (7) indicated that a two-tier system (of dentists and denturists) would attract 'the other 50%' of Americans who are irregular dental attenders and who may not seek denture treatment (or proceed with any recommended denture treatment) because of the high cost of care.

In New Zealand, the cost of dental treatment is a major barrier for adults (8). Stanley (9) found that dentist fees are mostly unknown (or unavailable) to patients prior to their appointment, thus creating uncertainty about the price of using such services. The advent of denturism has been described as a

positive initiative for the consumer, as it provides an alternative option (10). Abrams' survey of denturists in Ontario, Canada found that most were of the opinion that they provided more affordable care than dentists (11). However, when this assertion was analysed, it was found that, although average dentist procedure fees were 15% higher than those of denturists overall, there was a range of prosthodontic services (including removable partial dentures) that were less expensive when obtained from dentists. Based on this analysis, Abrams questioned whether the cheaper service claimed by denturists was, in fact, being provided. Similarly, Friedrichsen *et al.* (12) also found no statistically significant price differences between the two professional groups in the USA. Devlin (13) tested the hypothesis that New Zealand dentists had responded to competition from denturists by lowering their fees. Her findings indicated no significant change in fees, mainly because of consumers' lack of information and the dentists themselves not being willing to modify their fees.

The use of implant-supported overdentures has improved outcomes for edentulous patients compared with conventional dentures. These are reduced residual ridge resorption, improved retention and support of the prostheses resulting in better quality of life, function, chewing, nutritional status and general health (14, 15). This has therefore resulted in denturists as well as dentists acknowledging a shift in the accepted treatment paradigm from conventional dentures to implant-supported overdentures for edentulous patients (16, 17). Implant-supported overdentures may be cost-effective in the long term, but the initial outlay can still be as much as three times that for conventional dentures, depending on the number of implants used (18). MacEntee and Walton (19) suggested that if past experiences of the inroads denturists have made into conventional dentures are used as a guide, then their impact on implant-supported overdentures is likely to be significant.

The aim of this study was to describe and compare the provision of removable prosthodontic services by dentists and denturists in New Zealand, to determine the answers to questions such as: (i) do dentists and denturists differ with respect to their range of denture services and associated professional fees; and (ii) do dentists and denturists differ in the frequency with which they recommend implant-supported overdentures for edentulous patients?

Materials and methods

Sampling procedure

Local ethical approval for the study was obtained from the Human Ethics Committee of the University of Otago, Dunedin, New Zealand. Following a pilot test with small number of local denturists, a structured questionnaire and covering letter were mailed to 630 participants in New Zealand (all the 156 registered denturists and 474 randomly selected dentists). The sampling frames were the two registers maintained the Dental Council of New Zealand. Total confidentiality was assured to the respondents, who gave implied consent by returning their completed questionnaires. The information which was collected from both samples included their gender and age, and their practice characteristics. Information was also sought on the range of removable prosthodontic services provided, the professional fees charged and the extent to which implant-supported overdentures were offered to patients. A number of accepted strategies were used to maximize the response rate; these included entry into a prize draw (sponsored by a local dental laboratory), reply-paid envelopes and a second mail-out to those who had failed to respond to the first mail-out within 5 weeks. After this period, a phone call or electronic mail was used (where practicable) to further improve the response.

Data analysis

Data were entered into a MICROSOFT EXCEL spreadsheet and analysed using the Statistical Package for the Social Sciences* (SPSS) (Version 13.0). After the computation of descriptive statistics, bivariate analyses examined the associations between occupational type (the main independent variable) and the dependent variables. ANOVA was used to compare mean values, while chi-squared tests were used to test the statistical significance of differences between proportions. *P*-values of <0.05 were considered to be statistically significant.

Results

From the 630 participants (474 dentists and 156 denturists) who were sent the questionnaire, 22 were

out of frame because of database inaccuracies. This left a total of 608 participants (458 dentists and 150 denturists) who were within the sampling frame. Overall, data were available from 410 respondents, for an overall response rate of 67.43%. From these 410 respondents, 290 came from the dentists (males 78.6%, *n* = 228; females 21.48%, *n* = 62) and 120 from denturists (males 91.7%, *n* = 110; females 8.3%, *n* = 10). The mean age of dentists was 48 years (s.d. 11), while that for denturists was 53 years (s.d. 14; *P* < 0.01). Most respondents (78% of dentists; *n* = 226 and 81% of denturists; *n* = 98) were over 40 years of age, with one in three denturists (but only one in seven dentists) over 60 years of age. One in three denturists were over 60 years of age, while the equivalent for dentists was one in seven. There was more experience among the dentists in removable prosthodontics than denturists.

Professional services and fees

Bearing in mind that the respondents only ticked the service on the structured questionnaire if they provided it, the data on fee ranges for prosthodontic services are presented by (occupational type) in Table 1. One in four of the denturists had offered prosthodontic services for <5 years, while the equivalent estimate for the dentist respondents was approximately one in 20. There were significant differences between dentists and denturists only with respect to charging <NZ\$ 1000 for complete dentures, single complete dentures and implant-supported overdentures. Denturists' complete denture fees were generally lower than those from dentists, and similar differences were apparent for immediate dentures and single relines/rebases. Partial denture fees (whether cobalt-chromium or acrylic) were similar. Some respondents indicated a fee range (in all cases <NZ\$1000), while others just noted that they provided that service (1NZ\$ = US\$ 0.75; 1NZ\$ = € 0.56; 1NZ\$ = GBP 0.38).

Referral of removable prosthodontic patients

As is indicated in Table 2 with regard to the referral of denture patients, almost 50% (*n* = 137) of denturists reported referring patients to dentists, while nearly 70% (*n* = 81) of the dentists referred patients to denturists. One in three dentists (*n* = 100) did not refer at all, while the equivalent for denturists was one in 10 (*n* = 12). One-third of dentists (34.5%; *n* = 100)

*SPSS Inc., Chicago, IL, USA.

Table 1. Fee ranges by occupational type for prosthodontic services (percentages in brackets)

	Occupational type		
	Dentist	Denturist	Both combined
Complete dentures			
<NZ\$1000	19 (8.3)	43 (38.7)*	62 (18.3)
NZ\$1000–\$1500	121 (53.1)	52 (46.8)	173 (51.0)
NZ\$1501–\$2000	69 (30.3)	12 (10.8)	81 (23.9)
NZ\$2001–\$3000	13 (5.7)	4 (3.6)	17 (5.0)
>NZ\$3000	6 (2.6)	0 (0.0)	6 (1.8)
Total	228 (100.0)	111 (100.0)	339 (100.0)
Immediate dentures			
<NZ\$1000	44 (19.6)	29 (29.3)	73 (22.5)
NZ\$1000–\$1500	87 (38.7)	42 (42.4)	129 (39.8)
NZ\$1501–\$2000	78 (34.7)	24 (24.2)	102 (31.5)
NZ\$2001–\$3000	13 (5.8)	4 (4.0)	17 (5.2)
>NZ\$3000	3 (1.3)	0 (0.0)	3 (0.9)
Total	225 (100.0)	99 (100.0)	324 (100.0)
Single denture reline/rebase			
<NZ\$100	4 (1.7)	3 (2.7)*	7 (2.0)
\$NZ100–\$200	36 (15.5)	42 (37.8)	78 (22.7)
\$NZ201–300	130 (56.0)	55 (49.5)	185 (53.9)
\$NZ301–400	52 (22.4)	11 (9.9)	63 (18.4)
>\$NZ400	10 (4.3)	0 (0.0)	10 (2.9)
Total	232 (100.0)	111 (100.0)	343 (100.0)
Implant-supported overdentures			
<NZ\$1000	4 (4.7)	5 (15.6)*	9 (7.6)
NZ\$1000–\$1500	17 (19.8)	4 (12.5)	21 (17.8)
NZ\$1501–\$2000	20 (23.3)	10 (31.3)	30 (25.4)
NZ\$2001–\$3000	23 (26.7)	8 (25.0)	31 (26.3)
>NZ\$3000	22 (25.6)	5 (15.6)	27 (22.9)
Total	86 (100.0)	32 (100.0)	118 (100.0)
Cobalt chromium partial dentures			
<NZ\$1000	52 (20.6)	52 (52.5)*	104 (29.5)
NZ\$1000–\$1500	123 (48.6)	33 (33.3)	156 (44.3)
NZ\$1501–\$2000	66 (26.1)	14 (14.1)	80 (22.7)
NZ\$2001–\$3000	9 (3.6)	0 (0.0)	9 (2.6)
>NZ\$3000	3 (1.2)	0 (0.0)	3 (0.9)
Total	253 (100.0)	99 (100.0)	352 (100.0)
Acrylic partial dentures			
<NZ\$1000	234 (93.6)	97 (93.3)	331 (93.5)
NZ\$1000–\$1500	13 (5.2)	7 (6.7)	20 (5.6)
NZ\$1501–\$2000	3 (1.2)	0 (0.0)	3 (0.8)
Total	250 (100.0)	104 (100.0)	354 (100.0)

* $P < 0.05$ (1NZ\$ = US\$ 0.75; 1NZ\$ = € 0.56; 1NZ\$ = GBP 0.38).

Totals of each prosthodontic service reflect positive responses from respondents.

referred their complete denture patients, while one in eight denturists (13.3%; $n = 16$) referred to other colleagues. Conversely, denturists referred more than one-third of immediate dentures (37.5%; $n = 45$) and one-quarter of cobalt chromium partial dentures cases

Table 2. Referral of denture patients and services by occupational type (percentages in brackets)

	Occupational type		
	Dentist	Denturist	Both combined
Routinely refer denture patients to			
Dentists	30 (10.3)	81 (67.9)*	111 (27.1)
Denturists	137 (47.2)	9 (7.5)	146 (35.6)
Prosthodontists/specialists	71 (24.5)	49 (40.8)	120 (29.3)
No referrals made	100 (34.5)	12 (10.0)	112 (27.3)
Denture service referred			
Complete dentures	100 (34.5)	16 (13.3)	116 (28.3)
Immediate dentures	32 (11.0)	45 (37.5)	77 (18.8)
Acrylic partial dentures	34 (11.7)	20 (16.7)	54 (13.2)
Denture relines	45 (15.5)	10 (8.3)	55 (13.4)
Cobalt chromium partial dentures	17 (5.9)	31 (25.8)	48 (11.7)
Implant-supported overdentures	66 (22.8)	43 (35.8)	109 (26.6)
All dentures services	31 (10.7)	5 (4.2)	36 (8.8)
No referrals made	33 (11.4)	4 (3.3)	37 (9.0)

* $P < 0.05$.

(25.8%; $n = 31$). One in four of the dentists referred implant-supported overdentures, while one-third of denturists referred these cases. Just over 10% of the dentists referred all of their denture cases.

Implant-supported overdenture treatment

More than 50% ($n = 55$) of denturists were routinely recommending implant-supported overdentures (Table 3). The mandibular implant-supported overdenture option was recommended by a higher proportion of the denturists. The mandibular implant-supported overdenture design used in New Zealand is more often than not two unsplinted implants with ball abutment patrices using different gold, titanium, plastic or nylon matrices on the undersurface of the prostheses. Neither occupational group recommended a maxillary implant-supported overdenture to oppose a dentate mandibular arch. Over half of each occupational type informed 'very few' patients of the available implant-supported overdenture treatment options. Implant-supported overdenture relines were more commonly provided by denturists than dentists. Over three-quarters of either occupational group were not required to insert implant-supported overdentures in the previous year; the equivalent estimate for the previous

	Occupational type		
	Dentist	Denturist	Both combined
Recommendation of implant-supported overdentures			
Yes	100 (36.1)	55 (50.5)*	155 (40.2)
No	177 (63.9)	54 (49.5)	231 (59.8)
Total	277 (100.0)	109 (100.0)	386 (100.0)
Missing data	13	11	24
The implant-supported overdenture option recommended			
Mandibular implant-supported overdenture only	32 (34.0)	35 (71.4)*	67 (46.9)
Maxillary implant-supported overdenture only	0 (0.0)	0 (0.0)	0 (0.0)
Maxillary and mandibular implant-supported overdentures	62 (66.0)	14 (28.6)*	76 (53.1)
Total	94 (100.0)	49 (100.0)	143 (100.0)
Informing patients of the implant-supported overdenture treatment option			
None	49 (17.9)	19 (16.7)	68 (17.5)
Very few (1–40)	138 (50.4)	60 (52.6)	198 (51.0)*
A few (41–60)	40 (14.6)	19 (16.7)	59 (15.2)
Quite a lot (61–80)	21 (7.7)	9 (7.9)	30 (7.7)
Most/all (81–100)	26 (9.5)	7 (6.1)	33 (8.5)
Total	274 (100.0)	114 (100.0)	388 (100.0)
Missing data	16	6	22
Implant-supported overdenture service offered			
Mandibular overdenture only	42 (14.5)	25 (20.8)	67 (16.2)
Maxillary overdenture only	6 (2.1)	3 (2.5)	9 (2.2)
Maxillary and mandibular implant-supported overdentures	67 (23.1)	21 (17.5)	88 (21.5)
Relined overdentures	15 (5.2)	26 (21.7)	41 (10.0)
Other	0 (0.0)	3 (2.5)	3 (0.7)

* $P < 0.05$.

5 years was two-thirds. One in five of the dentists and one in six of the denturists had inserted fewer than five implant-supported overdentures in the past 5 years.

Discussion

This survey of denturists and dentists was conducted to investigate the impact of denturists on prosthodontic services and fees in New Zealand. It has been found that denturists' fees tended to be generally lower for most prosthodontic services. Before discussing the study's findings, it is appropriate to consider their generalizability. The sample appears to be largely representative of dentists (if slightly under-representative of females and younger practitioners) when the estimates are compared with those for the most recent New Zealand workforce analysis (20). However, the sample is highly likely to be representative of denturists, given that the entire active workforce was sampled, and the response rate was high. Thus, it is possible to cautiously generalize the study findings to the source populations.

Table 3. Promotion of implant-supported overdentures (percentages in brackets)

Consistent with earlier findings in Canada (20), denturists appear to be having an impact on prosthodontic fees charged by dentists in New Zealand by providing an element of competition to the market. Our findings indicate that denturists were predominantly in the lower fee ranges for prosthodontic procedures, and this is consistent with the prediction of Friedrichsen *et al.* (12), who hypothesized that legalizing denturists' practice would make dentures more affordable for the public. Devlin (13) examined the perceived benefits for consumers soon after the 1988 Dental Act legalized denturism (and professional advertizing) in New Zealand, and concluded that 'the competitive process appears to have generated few of the benefits anticipated by the policy makers in terms of market prices'. Now, nearly two decades later, benefits to the consumer are observable, as dentists appear to have also kept their fees moderate (although they average 25% more than those of denturists). The findings of this survey draw parallels with those of Abrams (11), in that there are some services offered by each oral health

practitioner group that are priced either the same as or lower than those of the other. This also matches the assertion of Kushman (9) that the introduction of denturism was appropriate because it was likely to introduce an element of competition into the oral health services market, with potential economic benefits for the consumer. With the introduction of denturism and professional advertising, more information on removable prosthodontic services and alternatives is now available for New Zealand consumers.

The 34.5% ($n = 100$) of dentists who were referring their complete denture patients reflects the changing nature of general dental practice in New Zealand, away from removable prosthodontics. Conversely, with the denturists in New Zealand not being able to deal with patients with unhealed denture-bearing mucosa, it is encouraging that 37.5% ($n = 45$) of the denturists were referring their immediate denture cases. Our data indicate that the requirement for an oral health certificate issued by a dentist before denturists can commence treating patients with removable partial dentures appears not to have been a deterrent for New Zealand denturists, with more than four out of five denturists reporting that they provide both cobalt-chromium and acrylic partial dentures. The economic benefits for the consumer are underlined by the finding that, for cobalt-chromium partial dentures, a greater proportion of denturists than dentists charged <NZ\$1000. However, the pattern of economic benefit was less clear with removable acrylic partial dentures, as the most common fee for both denturists and dentists was <NZ\$1000.

The findings of the current study suggest that a good relationship does exist between dentists and denturists in New Zealand, with a relatively high proportion now referring cases to each other (with one-third of immediate denture cases, one-quarter of cobalt-chromium partial dentures and one-third of implant-supported overdenture cases being referred to dentists by denturists). The referrals from dentists to denturists support an earlier New Zealand finding that a large percentage of dentists felt that denturists could handle the simpler denture cases (21) (a high proportion of whom are likely to be low-income patients). The extent of such referrals tends to support the findings of earlier Canadian and Finnish work: that dentists and denturists can improve oral health quality of life for older people through a co-operative and mutually supportive relationship (2, 10, 19).

Significantly, there was a high percentage of dentists who did not refer to any other health practitioners at all, including specialists. With only one-quarter of the dentist respondents involved in implant-supported overdenture delivery, and two-thirds not routinely recommending them, one wonders what treatment options are recommended for patients with severe residual ridge resorption. Though denturists' involvement in implant-supported overdentures in New Zealand is still in its infancy, a professional attitude appears to be developing, as evidenced by the fact that over half of the respondents indicated that they recommended this treatment option, with three out of four recommending the mandibular implant-supported overdenture. The explanation for this may be that, as qualified dental technicians, denturists would be inclined to recommend an area they understood can be easily be both clinically and technically compromised. As indicated in the UK, this may not be the case for dental students who undergo training to be dentists, where the technical training and understanding, not only implant-supported overdentures, but also all facets of removable prosthodontics, have been changing (22, 23).

The findings of the current survey suggest and confirm that the number of dentists offering implant-supported overdenture services in New Zealand is limited (24). Regrettably, this indicates that the dental professions in New Zealand still continue to view conventional dentures as the first option for edentulous patients, as opposed to implant-supported overdentures to improve their quality of life (25).

In conclusion, the study findings suggest that denturists have gained more than parity with dentists with respect to the denture market in New Zealand. The activities of denturists are having a major impact as they increase their share of the removable prosthodontics market.

Acknowledgments

We greatly appreciate the support provided by registered dentists and clinical dental technicians in New Zealand, by responding to the survey. We acknowledge editorial assistance from Shirley Claxton and Nicole Gorman of the Department of Oral Rehabilitation, School of Dentistry, University of Otago, Dunedin, New Zealand. This research was facilitated by departmental funds made available by Mr David Purton, Head of

Department of Oral Rehabilitation, School of Dentistry, University of Otago, Dunedin, New Zealand.

References

- Knazan Y, McCarthy JA. Comparison of complete dentures fabricated by professional and non-professional personnel. *J Can Dent Assoc.* 1987;53:557–560.
- MacEntee M, Pierce CA, Williamson MF. Removable prosthodontic services for dentists in B.C. *J Can Dent Assoc.* 1980;46:764–767.
- Morin C, Lund JP, Sioufi C, Feine JS. Patient satisfaction with dentures made by dentists and denturologists. *Brit Dent J.* 1998;54:205–212.
- Rosenstein DI, Empey G, Chiodo GT, Phillips D. The effects of denturism on denture prices. *Am J Public Health.* 1985;75:671–672.
- Tuominen R. Clinical quality of removable dentures provided by dentists, denturists and laboratory technicians. *J Oral Rehab.* 2003;30:347–352.
- Hazelkorn HM, Christoffel T. Denturism's challenge to the licensure system. *J Public Health Policy.* 1984;58:643–646.
- Gerughty RM. Keynote Address to National Denturists Association. Phoenix, Arizona: January 20th, 1984.
- Jamieson LM, Thomson WM. Dental health, dental neglect, and use of services in an adult Dunedin population sample. *NZ Dent J.* 2002;98:4–28.
- Stanley B. The consumer-provider partnership. *NZ Dent J.* 2000;96:106–108.
- Kushman JE. Consumers and competition in health care: the case of denturism. *J Consum Aff.* 1984;18:1–21.
- Abrams SH. Denturists: do they really provide more affordable care in Ontario? *J Can Dent Assoc.* 1997;63:771–774.
- Friedrichsen S, Herzog A, Christie C. A socioeconomic comparison of patients receiving prostheses in a two-tier delivery system. *J Prosthet Dent.* 1992;67:348–357.
- Devlin NJ. The effects of denturism: New Zealand dentists' response to competition. *Am J Public Health.* 1994;84:1675–1677.
- Zarb GA. The edentulous predicament. In: Zarb GA, Bolender CL, Carlsson CE, eds. *Boucher's Prosthodontic Treatment for Edentulous Patients*, 12th ed. Mosby: St Louis; 2004:4–5.
- Albrektsson T, Wennerberg A. The impact of oral implants-past and future 1966-2042. *J Can Dent Assoc.* 2005;71:327.
- Davis DM. The shift in the therapeutic paradigm: osseointegration. *J Prosthet Dent.* 1998;79:37–42.
- Carlsson GE. Future directions. In: Feine JS, Carlsson GE, eds. *Implant Overdentures: The Standard of Care for Edentulous Patients*. Illinois: Quintessence, 2003:145–154.
- Zitzmann NU, Marinello CP, Sendi P. A cost-effectiveness analysis of implant overdentures. *J Dent Res.* 2006;85:717–721.
- MacEntee M, Walton JN. The economics of complete dentures and implant-related services: a framework for analysis and preliminary outcomes. *J Prosthet Dent.* 1998;79:24–30.
- MacEntee M. Denturists and oral health in the aged. *J Prosthet Dent.* 1994;71:192–196.
- Ong CT, Pan N, Tiang R, Payne AGT, Thomson WM. General dental practitioners' perceptions of removable prosthodontics in the undergraduate curriculum. *NZ Dent J.* 1999;95:80–83.
- Clark RKF. The future teaching of complete denture construction to undergraduates. *Brit Dent J.* 2002;193:13–14.
- McCord F. Understanding prosthodontics-where did it all go wrong? *Int J Prosthodont.* 2003;5:335–339.
- Reid D, Leichter JW, Thomson WM. Dental implant use in New Zealand in 2004. *NZ Dent J.* 2005;101:12–16.
- MacEntee M. The impact of edentulism on function and quality of life. In: Feine J, Carlsson GE, eds. *Implant Overdentures: The Standard of Care for Edentulous Patients*. London: Quintessence; 2003:23–28.

Correspondence: Associate Professor Alan G. T. Payne, Oral Implantology Research Group, Sir John Walsh Research Institute, School of Dentistry, 280 Great King Street, Dunedin, New Zealand.
E-mail: alan.payne@dent.otago.ac.nz