

## IN BRIEF

- Increased longevity and retention of natural dentition will mean the increased demand for domiciliary dental care will continue.
- CDOs and GDPs provide a different level and breadth of domiciliary dental care, with particular problems identified in the GDS.
- The suitability, safety and provision of equipment and supplies were especially problematic.
- An urgent need for training in relation to health & safety issues was identified.
- The development of national guidelines for domiciliary dental care is recommended.

# Provision of domiciliary dental care by Scottish dentists: a national survey

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Demand for domiciliary dental care is increasing as a result of a growing population of elderly and functionally dependent patients, legislative pressure and an increasingly dentate population.

**Objective** To estimate the amount and types of dental care currently being undertaken on a domiciliary basis in Scotland and to examine the barriers to the provision of such care.

**Method** A descriptive study, involving a self-administered postal questionnaire was employed. All general dental practitioners ( $n = 1,995$ ) and community dental officers ( $n = 200$ ) in all Health Board areas across Scotland were included in the postal survey. Data were analysed in SPSS.

**Results** The valid response rate was 66%. Sixty-seven percent of dentists undertook at least one domiciliary visit per year, mainly for elderly patients. Prosthetic treatment was undertaken most commonly. Other types of treatment were delivered mainly by the community dental service. Many dentists did not carry a light source or emergency essential drugs and half of the dentists overall were not confident to administer emergency drugs. Significant problems were identified in relation to the packaging and carriage of contaminated instruments and clinical waste. Of those respondents not providing domiciliary care, 19% stated that they would never consider doing so. Barriers to the provision of domiciliary care included time, poor remuneration, concerns about infection control, emergency drugs and lack of suitable equipment, and the difficulties of carrying equipment.

**Conclusion** Staff training, specialist equipment and new service models for the delivery of domiciliary care are required.

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## INTRODUCTION

Domiciliary dental care is defined as the provision of dental care in an environment where a person is resident either permanently or temporarily, as opposed to dental care delivered in a fixed dental clinic or a mobile dental unit.<sup>1</sup> The number of people requiring domiciliary dental care services is increasing for a variety of reasons<sup>2-4</sup> and it is often unreasonable or impractical for them to attend a dental surgery for treatment. The increasingly dentate elderly population requires more complex treatment than has previously been provided in this way, which presents the dental profession with a major challenge, as the delivery of domiciliary care requires greater commitment of staff time, equipment and expertise. Previous studies have shown that dentists felt unable to deal with the provision of even routine dental procedures in the home setting and that the level of remuneration offered was inadequate.<sup>5-8</sup> There were also issues with the quantity and cost of equipment required.<sup>9</sup> It is important that those planning the delivery of oral health-care services for the future have a clear understanding of the extent of the need for domiciliary care and the barriers to its implementation.

The aims of this study were:

- To estimate the level of domiciliary care being provided in Scotland, both in terms of the numbers and designation of the practitioners providing such care, as well as the numbers of domiciliary patients served
- To identify the nature of the service in terms of patient groups served, clinical procedures undertaken, and equipment used
- To investigate any differences in the care provided by general dental practitioners and community dental officers
- To examine barriers to the current and future provision of such care.

## MATERIALS AND METHODS

### Study design

In this descriptive study, questionnaires were sent to all general dental practitioners (GDPs) and community dental officers (CDOs) in all Scottish Health Board areas. A

reply-paid envelope and an explanatory letter were also included. A second mail shot was sent eight weeks later to encourage a fuller response.

The questionnaire was divided into three sections. Section A was pertinent to all respondents and collected mainly demographic information. Section B related to those respondents who reported undertaking domiciliary care. Information was sought on issues such as current provision for domiciliary services across the 'special needs' groups of patients and perceived difficulties with the provision of such services. Respondents were requested to provide information about the equipment normally taken on routine domiciliary visits by ticking the relevant boxes in an equipment list provided. Section C was for those dentists who did not routinely provide domiciliary care and requested reasons for non-provision and suggestions for changes which might improve the service.

#### Data entry and statistical analysis

Data were entered into a database and analysed in SPSS (SPSS (UK) Ltd, Woking, Surrey). Differences in proportions of dichotomous and categorical variables were tested using the Pearson Chi-square statistic (Fisher's Exact Test for 2 x 2 tables where a cell has an expected frequency <5). Tests of differences in means of numbers of patients seen were tested using the t-test of independent samples. Spearman's rho was used to examine the relationship between ordinal variables.

## RESULTS

### Response rate

Of the 2,195 questionnaires posted, 1,494 were returned, giving a response rate of 68%. When the returned questionnaires were examined, 135 were excluded because they were from retired practitioners, those on maternity leave, or the practitioner was no longer at the same address. This gave a final count of 1,359 returned questionnaires from a corrected total of 2,060, providing a final response rate of 66% (62% of GDPs and 85% of CDOs).

### Demographics of respondents

Of the dentists who returned the questionnaires, 1% were aged under 25 years, 68% were 25–45, and 31% were over 45. Sixty-three percent were male. Responses were received from all NHS Board regions in Scotland, with 71% of respondents working in an urban environment, 19% rural and 10% in a mixed rural/urban environment. Eighty-five percent of respondents were GDPs and 15% CDOs.

### Providers of domiciliary dental care

Of the 1,359 respondents, 914 (67%) reported providing some domiciliary care. Providers\* were more likely to be CDOs and to be working in a rural/mixed practice (see Table 1). Thus 88% of the 97 CDOs in rural/mixed areas were providers, as were 72% of the 278 GDPs in rural/mixed areas, 67% of the 105 CDOs in urban areas, and 64% of the 814 GDPs in urban areas. The difference between CDOs and GDPs was significant in non-urban areas ( $p < 0.001$ ), but not in urban areas ( $p = 0.625$ ). There was no association between domiciliary care provision and dentist age-group or gender.

### Workload

While the mean reported number of domiciliary patients seen per month was 4.11 (SD = 7.30), the distribution was skewed towards zero, with 7% seeing fewer than one patient per month, 46% one per month, 27% two to four per month, 8% five to nine per month, and 13% ten or more per month.

CDOs tended to see more patients than GDPs, with more than half of CDOs seeing 10 or more patients per month, compared with only 4% of GDPs ( $p < 0.001$ ). In terms of total patient numbers seen, 710 GDPs reported seeing a total of 1,581 patients on average per month, whilst 151 CDOs saw a total of 1,978 patients. Table 2 shows that dentists who provided care to elderly patients in residential care homes tended to have a higher workload than those who did not, with 15% of such dentists seeing ten or more patients per month compared with only 1% of those who did not serve such patients. Providers in rural or mixed areas reported higher domiciliary workloads compared to those in urban practices (Table 2). This is explained by the concentration of CDOs and the number of visits to residential care homes, both of which were more common in non-urban areas. Thus, the highest workload was reported by CDOs serving elderly care home residents, followed by CDOs with no elderly residential care workload, then GDPs with an elderly residential care workload and GDPs without.

Table 3 shows the patient categories reported by GDPs and CDOs. GDPs were more likely to provide domiciliary care exclusively to elderly patients (62% of GDPs compared with 33% of CDOs ( $p < 0.001$ )). Apart from elderly patients living in their own home, CDOs were more likely to see all categories of patients.

CDOs were more likely to make domiciliary visits during normal surgery hours, with 83% (127) of responding CDOs saying that domiciliary care was always undertaken during these hours, compared with 32% of GDPs ( $p < 0.001$ ). Domiciliary visits by GDPs tended to be after surgery hours, with 27% reporting visits always being after hours compared with just one CDO ( $p < 0.001$ ). Most (83%) of CDOs said they were always accompanied on domiciliary care visits, compared with 35% of GDPs ( $p < 0.001$ ).

### Carriage of equipment and drugs

Equipment and emergency drugs routinely carried on domiciliary visits are listed in Table 4. A prosthetics kit and an inspection kit were the most common items carried by both GDPs and CDOs. Forty-three percent did not carry an inspection light, including 39% of dentists who routinely performed check-ups and 37% of those who routinely did mucosal lesion examinations. Very few carried a fire extinguisher or personal alarm. As Table 4 shows, many of the items were significantly less likely to be carried by GDPs. There was also a tendency for both GDPs and CDOs who saw fewer patients to report carrying fewer items of equipment ( $p < 0.001$  for GDPs,  $p < 0.05$  for CDOs).

Dentists were asked which emergency drugs they routinely carried on domiciliary care visits (Table 4). Whilst 44–52% of CDOs reported carrying each of the five specified drugs, only 12–22% of GDPs did so. Forty percent of CDOs and 73% of GDPs

\* To aid interpretation, the term 'providers' is used to refer to those who reported providing domiciliary care, and 'non-providers' to those who reported that they did not.

**Table 1 Dentists' characteristics and domiciliary care provision**

	Providers	Non-providers	n	p value
GDPs	66%	34%	1,149	<0.01
CDOs	76%	24%	209	
Aged under 45	68%	32%	924	0.399 (n.s.)
Aged over 45	66%	34%	422	
Male	70%	30%	747	0.195 (n.s.)
Female	66%	34%	441	
Mainly urban practice	65%	35%	919	<0.001
Rural/mixed practice		24%	375	

n.s.: not significant (p>0.05)

**Table 2 Numbers of domiciliary patients seen per month by practitioner status, elderly residential care workload and type of practice**

Number of domiciliary patients per month	Practitioner		Elderly in residential care seen		Type of practice	
	CDO (n = 151)	GDP (n = 716)	Yes (n = 722)	No (n = 145)	Rural/mixed (n = 263)	Urban (n = 568)
0-4	33%	89%	76%	96%	74%	82%
5-9	12%	7%	9%	3%	9%	7%
10 or more	54%	4%	15%	1%	17%	11%
p value	<0.001		<0.001		<0.01	

**Table 3 Reported domiciliary care patient categories**

Patient category	GDPs (n = 755)	CDOs (n = 159)	p value
Elderly patients in own home	94%	94%	0.771 (n.s.)
Elderly patients in residential care	81%	91%	<0.01
Stroke patients	31%	70%	<0.001
Terminally ill patients	30%	58%	<0.001
Psychiatric patients	8%	59%	<0.001
Spinal injuries patients	9%	29%	<0.001
Learning disabilities patients	5%	60%	<0.001
Child patients	2%	20%	<0.001

reported that they did not routinely carry *any* of the five drugs recommended in the Scottish National Dental Advisory Committee (NDAC) guidelines.<sup>9</sup> Of those who reported routinely carrying at least one drug, 30% of CDOs and 45% of GDPs said they did not feel confident administering emergency drugs. Training in CPR had been received by 96% of dentists within the previous three years, 67% within the previous 12 months.

#### Types of treatment provided

Nine hundred and five dentists provided information on the types of treatment routinely undertaken on domiciliary visits (Table 5). GDPs were less likely to provide most of the treatments listed. Prosthetic procedures, including provision of complete and partial dentures, denture repairs and temporary denture base relines, were the most common treatment type for both groups of dentists. Dental and mucosal examinations

**Table 4 Equipment and emergency drugs routinely taken on domiciliary visits by GDPs (n = 755) and CDOs (n = 159)**

	GDPs	CDOs	p value
Prosthetics kit	87%	91%	0.175 (n.s.)
Inspection kit	85%	93%	<0.01
Dental materials	60%	82%	<0.001
Mobile phone	62%	69%	0.105 (n.s.)
Light source	52%	82%	<0.001
Protective clothing	50%	62%	<0.01
Infection control items	45%	78%	<0.001
Portable handpiece	41%	59%	<0.001
Conservation kit	24%	57%	<0.001
Perio kit	19%	31%	<0.001
Hypodermic needles	20%	43%	<0.001
Laerdal mask	13%	56%	<0.001
Oropharyngeal airways	8%	35%	<0.001
Safeair	8%	33%	<0.001
Portable suction	7%	30%	<0.001
Surgical kit	5%	9%	<0.05
Fire extinguisher	1%	5%	<0.001
Personal alarm	0%	8%	<0.001
Portable headrest	0%	2%	0.069 (n.s.)
Other equipment	2%	6%	<0.01
<b>Emergency drugs</b>			
Adrenaline	22%	52%	<0.001
GTN spray	12%	46%	<0.001
Glucagon	12%	44%	<0.001
Oxygen	13%	48%	<0.001
Salbutamol inhaler	13%	46%	<0.001

**Table 5 Types of treatment routinely provided by GDPs (n = 748) and CDOs (n = 157)**

	GDPs	CDOs	p value
Complete denture construction	93%	96%	0.158 (n.s.)
Check-up	80%	91%	<0.01
Partial denture construction	73%	86%	<0.001
Denture repair	69%	80%	<0.01
Sore mouth – mucosal lesion exam	68%	84%	<0.001
Temporary dressing	65%	87%	<0.001
Temporary reline	60%	78%	<0.001
Simple extraction	61%	67%	0.157 (n.s.)
Glass ionomer restoration	46%	74%	<0.001
Scale and polish	42%	52%	<0.05
Replacement crown	10%	18%	<0.01
Composite restoration	6%	29%	<0.001
Amalgam restoration	2%	16%	<0.001
Surgical extraction	3%	3%	0.788 (ns)
Endodontics	0%	1%	0.080 (ns)

were also carried out regularly. The majority of both groups also reported temporary dressings and simple extractions.

**Table 6 Barriers to domiciliary care provision**

<b>(a) Providers' views on barriers to provision</b>		
	<b>GDPs (n = 377)</b>	<b>CDOs (n = 104)</b>
Access issues, lighting	19%	17%
Lack of time	19%	9%
Provision of equipment	10%	9%
Poor quality of service	8%	8%
Patient/staff co-operation	6%	7%
Legal requirements re drugs, resuscitation	6%	4%
Remuneration	5%	-
Health and safety issues	2%	10%
Combination of these factors	23%	32%
<b>(b) Non-providers' reasons for non-provision</b>		
	<b>GDPs (n = 394)</b>	<b>CDOs (n = 50)</b>
Lack of time	59%	28%
Poor remuneration	54%	4%
Quality of work concerns	47%	20%
Insufficient demand	42%	28%
Infection control concerns	35%	12%
Personal safety concerns	28%	6%
Equipment concerns	18%	8%

**Table 7 Facilitating domiciliary care**

<b>(a) Providers' views on changes to facilitate domiciliary care provision</b>		
	<b>GDPs (n = 300)</b>	<b>CDOs (n = 61)</b>
Better remuneration	35%	3%
Better equipment provision	26%	53%
Dedicated paid time	3%	18%
Practice guidelines	7%	7%
Combination of these factors	21%	18%
None	6%	-
<b>(b) Non-providers' views on what would encourage them to provide domiciliary care</b>		
	<b>GDPs (n = 296)</b>	<b>CDOs (n = 25)</b>
Better remuneration	24%	4%
Time away from surgery	7%	20%
Combination of factors	23%	16%
Nothing	31%	32%

As expected, the percentage of dentists routinely providing conservation treatment, such as amalgam and composite restorations, was fairly small.

#### Health and safety issues

The study identified a number of infection control issues, particularly concerning GDPs. The transport of clinical waste using a clinical waste bag was reported by 68% of CDOs but only 8% of GDPs ( $p < 0.001$ ). Fifty-six percent of GDPs reported using a polythene bag for this purpose. Use of a dedicated plastic container

for contaminated instruments was reported by 49% of CDOs and 20% of GDPs ( $p < 0.001$ ). Most GDPs (60%) used a plastic bag for contaminated instruments. A dedicated sharps box was used by 80% of CDOs and 11% of GDPs ( $p < 0.001$ ), 46% of GDPs using a polythene bag. Only 26% of CDOs and fewer than 1% of GDPs used dedicated containers for all three purposes (clinical waste, contaminated instruments and sharps), while 10% of CDOs and 71% of GDPs did not use them for any.

#### Barriers to provision of domiciliary care

Dentists providing domiciliary care were asked if there were particular problems with its delivery, and non-providers were asked about the reasons they did not undertake domiciliary care (Table 6 parts a and b).

Lack of time, access issues, lighting and equipment were the most common barriers identified by providers responding to this question (Table 6a). Of the non-providers, both GDPs and CDOs commonly cited lack of time and concerns over the quality of domiciliary care provision. Only 38 dentists (32 of them GDPs) gave lack of demand as the *only* reason for non-provision (Table 6b).

Male non-providers were more likely than females to give poor remuneration as a reason (57% for men, 30% for females,  $p < 0.001$ ). Non-providers in urban practices were more likely to cite personal safety concerns (28% of urban practice dentists, 13% of rural/mixed practice dentists;  $p < 0.01$ ), as were those aged under 45 (28% of under 45s, 19% of over 45s;  $p < 0.05$ ). No other significant associations were found.

#### Facilitating domiciliary care

Providers were asked what factors might facilitate greater provision of domiciliary care, whilst non-providers were asked what might encourage them to provide such care (Table 7 parts a and b). Thirty-five percent of provider GDPs thought higher or specific remuneration would encourage domiciliary care, while equipment provision was commonly cited by both GDPs and CDOs (Table 7a).

Among non-providers, 31% of GDPs and 32% of CDOs said nothing would encourage them to provide domiciliary care. However, 29% of GDPs and 12% of CDOs said better remuneration, either alone or in conjunction with other changes, would encourage them to do so (Table 7b).

#### DISCUSSION

This study investigated the level and delivery of domiciliary dental care and the barriers to its provision in the NHS in Scotland. All Scottish primary care NHS dentists were sent a questionnaire, and 62% of GDPs and 85% of CDOs responded. Responses from GDPs indicated that a large number (34%) undertook no domiciliary visiting, and some of the GDP non-responses may result from their judging the subject matter of the survey to be irrelevant to their practice. It is therefore possible that the results may over-estimate the proportion of GDPs who actually provide domiciliary care.

Nevertheless, the study provides a clearer picture of the current nature of domiciliary care provision in Scotland and how it varies between the general dental and the community dental services. Fewer GDPs undertook domiciliary care. When they did, their workload tended to be lighter and less varied in terms of types of patients and treatments covered, characteristically

servicing a few elderly patients. GDPs were more likely to make domiciliary visits after surgery hours, unaccompanied, and with a lower level of equipment and drugs.

Reports of the level of equipment carried into the domiciliary setting raise certain concerns. Transportation of equipment required to allow the safe delivery of satisfactory oral care may be difficult, especially when unaccompanied and in an urban practice area. This may limit the range of treatment provided. However, failure to carry a portable torch to provide an adequate light source is difficult to defend. Only half of the responding GDPs who provided domiciliary care reported carrying a light source routinely, despite the obvious need for good illumination of the oral cavity in the provision of clinically satisfactory dentistry.

The survey findings regarding carriage of emergency drugs and dentists' confidence in administering them have major implications for dentistry, both in the surgery as well as in a domiciliary setting. Fewer than 30% of GDPs and 60% of CDOs conducting domiciliary care reported carrying *any* emergency drugs, such as adrenaline, oxygen and salbutamol – drugs which must be available on surgery premises at all times. Elderly and other special needs patients who make up the bulk of domiciliary patients are more likely to suffer an emergency which requires administration of drugs.

The decision not to carry emergency drugs on domiciliary visits may be partly explained by the lack of confidence reported by many dentists in their ability to administer any of the recommended emergency drugs, despite 96% of them having attended CPR training in the previous three years. This implies that the training in emergency procedures provided for dentists may be neither frequent nor comprehensive enough.

There is also cause for concern regarding infection control through the safe transport and disposal of contaminated waste and sharps. For example, only 26% of respondents in this survey used a sharps box when performing clinical procedures on a domiciliary visit, and the majority of GDPs relied on polythene bags. The British Society for Disability and Oral Health has published *Guidelines and Recommendations on the Development of Standards for Domiciliary Dental Care Services*,<sup>10</sup> for which they are to be commended. However, there are currently no published guidelines available that advise specifically on infection control issues arising within a domiciliary dental care setting. Nevertheless, there are other generic standards relevant to all health care professionals which detail safe methods for transport, carriage and disposal of clinical waste, used instruments and contaminated sharps generated outwith clinical areas.<sup>11</sup> For GDPs, financial considerations may be an important factor, and should be taken into account when planning future service development.

Many responding dentists specifically requested training in control of infection and other health and safety issues relevant to a domiciliary setting, both for themselves and their staff. They were aware that it is their responsibility to take appropriate precautions to protect their patients and other members of the dental team from the risk of cross-infection and other health risks. Multi-disciplinary training programmes to address these problems are urgently required at both postgraduate and undergraduate level.

Despite a gradually declining population in Scotland, the demand for domiciliary dental care is likely to continue to

increase. The reasons for this include greater numbers of older people,<sup>3</sup> their changing dental status<sup>12,13</sup> and the increased numbers of people with special needs living in the community. The evidence provided by this study on why dentists, and in particular GDPs, do not provide domiciliary care may help to inform service planners. Inadequate resources, both in relation to time and money, were identified as major disincentives. However, clinical issues such as the standard of care that could be provided and infection control problems were also important, as was personal safety, particularly in urban areas. A significant minority of GDPs stated that they believed there was insufficient demand for domiciliary care amongst their patients. This may be due to a lack of perceived need for dental care by homebound patients, particularly the elderly, together with ignorance of the services which may be available.<sup>14,15</sup>

Changes suggested by those dentists currently providing domiciliary dental care may be equally relevant to the development of a service adequate for future needs. These included increased remuneration to facilitate time away from the practice, provision of suitable portable equipment, and training for all members of the dental team on a variety of health and safety issues, including emergency drug and CPR provision.

In summary, the provision of domiciliary dental care in Scotland remains problematic, particularly in relation to the nature of the service provided by GDPs. The increasing population of dependent dentate elderly will necessitate more dental care being provided in this manner in future. Service planning and development is urgently required, with training and financial incentives in place for GDPs, to allow a domiciliary dental service to be reached by all those whose age or infirmity preclude them from receiving treatment any other way.

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