

# Perceptions of general dental practitioners in Northern Ireland on the clinical management of patients taking direct oral anticoagulants

**Précis:** Most general dental practitioners in Northern Ireland are aware of the Scottish Dental Clinical Effectiveness Programme guidance on management of patients taking anticoagulants or antiplatelets, but require additional training and support to prevent inappropriate referrals.

## Abstract

**Statement of the problem:** Despite guidance advocating the management of patients taking direct oral anticoagulants (DOACs) in primary dental care settings, evidence from clinical audit in Northern Ireland suggested that a high proportion of patients were being referred to secondary and tertiary care settings for dental procedures with a bleeding risk.

**Purpose of the study:** The aim of this study was to evaluate the perceptions of general dental practitioners (GDPs) working in the health service in Northern Ireland on the clinical management of patients taking DOACs in primary dental care.

**Materials and methods:** A questionnaire was distributed to the 1,167 registered GDPs in Northern Ireland, assessing perceptions of the clinical management of DOAC patients in primary dental care. The data obtained was analysed using SPSS statistical software. Qualitative data underwent thematic analysis.

**Results:** A total of 344 questionnaires were analysed. Some 83% (285) of responding GDPs were aware of the Scottish Dental Clinical Effectiveness Programme (SDCEP) guidance. Some 98% (337) believed that patients taking DOAC medication could potentially be managed in primary care but that additional training was required. Some 80% (275) of GDPs had referred patients to secondary care. Procedures presenting a low risk of postoperative bleeding complications accounted for 12% (41) of referrals.

**Conclusions:** A lack of GDP confidence and experience in the management of DOAC patients are motivating factors in referral to secondary care settings for treatment. Some 12% of the referrals analysed were potentially inappropriate, given the low risk of associated postoperative bleeding complications. Additional training and support for GDPs, as well as enhanced awareness of the SDCEP guidance, is essential.

**Key words:** NOACs, DOACs, SDCEP guidance, anticoagulants, bleeding risk, GDP, primary care

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## Introduction

Thromboembolic disease constitutes a leading cause of mortality and morbidity worldwide.<sup>1,2</sup> Anticoagulants are an essential tool in the management of patients with thromboembolic disease due to their role in preventing the blood hypercoagulability that plays a central role in thrombogenesis.<sup>3</sup>

A number of disadvantages associated with traditionally used oral anticoagulants such as vitamin K antagonists (VKAs) led to the development of direct oral anticoagulants (DOACs), also known as novel oral anticoagulants (NOACs), first introduced to the UK in 2008.<sup>2,4</sup> DOACs are also referred to as target anticoagulants, as they directly inactivate thrombin Factor IIa (FIIa) and Factor X (FXa).<sup>5</sup> DOACs offer several advantages over VKAs: they are administered in standard doses; they eliminate the need for dose titration and laboratory monitoring; they have a rapid onset and offset of action, as well as increased predictability; and, they have a lower incidence of major bleeding.<sup>5</sup> There are currently four DOACs licensed for use in the UK: dabigatran, apixaban, edoxaban and rivaroxaban.<sup>6</sup>

Patients taking DOACs present an increased risk of bleeding during and following invasive dental procedures. The Scottish Dental Clinical Effectiveness Programme (SDCEP) published a guidance document in 2015 on 'Management of Dental Patients Taking Anticoagulant or Antiplatelet Drugs'.<sup>7</sup> This guidance includes advice on new-generation anticoagulants and antiplatelets, including DOACs, for oral health professionals within primary dental care. The SDCEP guidance advocates the management of patients taking DOACs in primary dental care, using procedure-specific bleeding risk to inform the need for alteration of the DOAC dose. The guidance outlines a number of measures to reduce the risk of postoperative bleeding, including planning treatment for morning clinics at the beginning of the week, the use of local measures, an atraumatic technique, and the importance of a detailed medical history to prevent postoperative bleeding problems.<sup>7</sup> This guidance has been endorsed by the Department of Health (DoH) in Northern Ireland. Dental procedures unlikely to cause bleeding, those with a low risk of postoperative bleeding complications, and those with a high risk of postoperative bleeding complications according to the SDCEP guidance are outlined in **Table 1**.<sup>7</sup>

Despite the recommendations of this guidance, evidence from clinical audit suggested that a high proportion of patients taking DOACs within Northern Ireland were being referred to secondary care settings for dental procedures with a bleeding risk. Previous evidence has suggested that a number of factors, including a lack of undergraduate oral surgery experience among recently qualified GDPs, as well as increasing numbers of patients retaining natural teeth against a background of complex medical histories and polypharmacy, can contribute to such referral patterns.<sup>8</sup> A survey of dentists in the Greater Manchester area found that 69% of respondents made a referral to secondary care services based on anticipated surgical difficulty, while 49% referred based on the complex nature of a patient's medical history, including DOACs.<sup>9,10</sup>

The aim of this study was to evaluate the perception of GDPs in Northern Ireland on the management of patients taking DOACs in primary dental care, including their awareness of the SDCEP guidance and the factors influencing referrals to secondary care settings. Ethical approval was granted by the School of Biomedical Sciences Ethics Filter Committee at Ulster University.

## Materials and methods

### Inclusion and exclusion criteria

The target population for this study included GDPs on the Northern Ireland dental list. Secondary care and private dental practitioners were excluded as the project related to health service referrals.

### Data collection

A questionnaire was designed to obtain quantitative and qualitative data from GDPs on their perceptions of managing DOAC patients in primary dental care, their awareness of the SDCEP guidance, and the factors influencing referrals. The questionnaire was initially piloted with dental and pharmacy staff at the Health and Social Care Board (HSCB) Northern Ireland, subsequently edited and then distributed to all 1,167 GDPs on the Northern Ireland dental list, with a cover letter containing instructions and information about the study. A stamped addressed envelope accompanied the questionnaires to facilitate their

**Table 1: Postoperative bleeding risk classification for dental procedures as per SDCEP guidance on 'Management of Dental Patients Taking Anticoagulants or Antiplatelet Drugs'.**

Dental procedures that are unlikely to cause bleeding	Dental procedures that are likely to cause bleeding	
	Low risk of postoperative bleeding complications	Higher risk of postoperative bleeding complications
Local anaesthesia by infiltration, intraligamentary or mental nerve block	Simple extractions (one to three teeth, with restricted wound size)	Complex extractions, adjacent extractions that will cause a large wound, or more than three extractions at once
Local anaesthesia by inferior dental block or other regional nerve blocks	Incision and drainage of intra-oral swellings	Flap-raising procedures: <ul style="list-style-type: none"> <li>▶ elective surgical extractions;</li> <li>▶ periodontal surgery;</li> <li>▶ pre-prosthetic surgery;</li> <li>▶ periradicular surgery; and,</li> <li>▶ crown lengthening.</li> </ul>
Basic periodontal examination (BPE)	Detailed six-point full periodontal examination	Dental implant surgery
Supragingival removal of plaque, calculus and stain	Root surface instrumentation (RSI) and subgingival scaling	Gingival recontouring
Direct or indirect restorations with supragingival margins	Direct or indirect restorations with subgingival margins	Biopsies
Endodontics – orthograde		
Impressions and other prosthetics procedures		
Fittings and adjustment of orthodontic appliances		

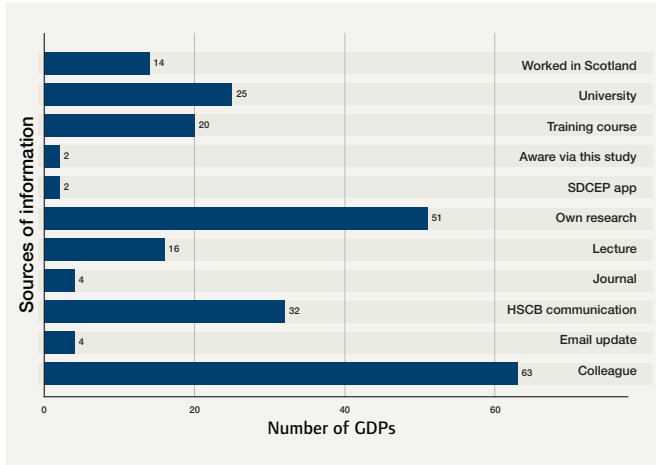


FIGURE 1: Range of sources by which GDPs became aware of the SDCEP guidance for managing DOAC patients in primary care.

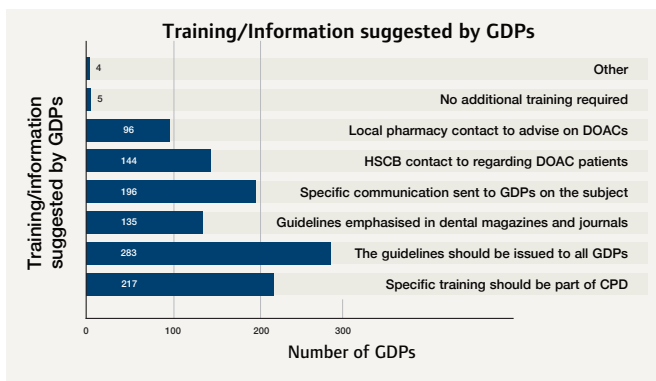


FIGURE 3: Range of options selected by GDPs to enable management of DOAC patients in primary care.

return. The collection, analysis and dissemination of data took place between August and December 2018. To maintain data confidentiality, a central location was used for the distribution and return of questionnaires. The addresses and names of dental practitioners were placed on envelopes by HSCB staff to ensure no traceability of subjects by the research team. Informed consent was gained from GDPs for participation.

The Raosoft<sup>11</sup> sample size calculator was used to determine the sample size required, based on parameters such as desired confidence level, total population size, response distribution and the tolerated margin of error. The acceptable parameter of confidence level required was set at 95%, response distribution at 50% and a margin of error of 5%, which resulted in a minimum recommended sample size of 290.

#### Data analysis and dissemination

The data obtained was analysed using SPSS statistical software.<sup>12</sup> Frequencies were used to describe one variable and crosstabulation later employed to describe the relationship between multiple variables. A Cronbach's alpha test was used to test reliability of the data. Pearson's chi-squared test was used to analyse the degree of significant correlation between categorical data variables at ordinal and nominal level. A p value was obtained to determine if a

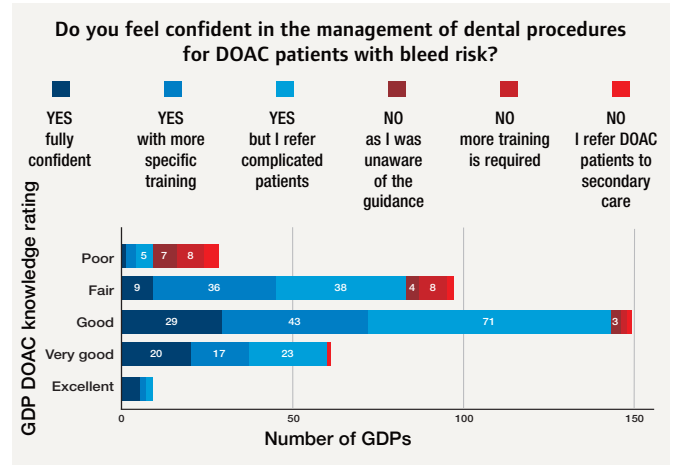


FIGURE 2: Comparison between GDP DOAC knowledge rating and their confidence in the management of dental procedures for DOAC patients with a bleeding risk in primary care.

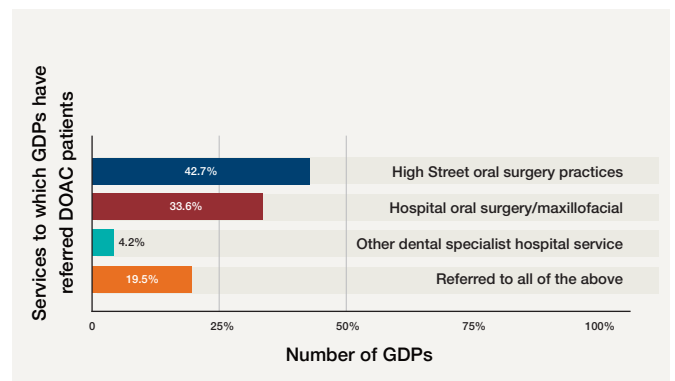


FIGURE 4: Services to which GDPs have referred DOAC patients.

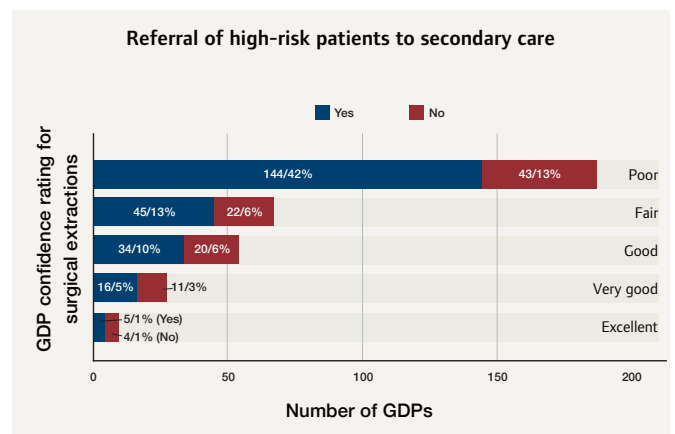


FIGURE 5: Comparison of GDP self-rating for complex extractions with number of referrals of DOAC patients to secondary care.

statistically significant relationship was present between variables. Qualitative analysis was used for open answered questions with free-text responses and main themes outlined as they emerged.

**Table 2: Number of low-risk procedures carried out by GDPs per month.**

Number	Matrix band application	Scaling
None	19	15
1-3	2	5
4-6	4	3
7-9	3	0
10+	316	321

## Results

A total of 344 of the questionnaires returned were suitable for analysis, giving a response rate of 30%. Seven questionnaires were excluded as they were incorrectly completed. The response rate achieved resulted in a margin of error of 4.44% and a confidence level of approximately 97.3%. An alpha coefficient of 0.842 (Cronbach's alpha test) suggested good internal consistency.

### Awareness of the SDCEP guidance

The majority (83.7%, n=288) of GDPs in the sample were aware of the SDCEP guidance. However, 24% (n=82) of those aware of the guidance were unaware that it had been endorsed by the DoH Northern Ireland. **Figure 1** shows the most common sources by which GDPs became aware of the guidance. Some 83.6% of GDPs (n=292) indicated that the SDCEP guidance increased their ability to treat patients taking DOACs in primary care, in comparison to 3.4% (n=10) who felt that they did not, and 13% (n=38) who were undecided.

### Self-rated level of DOAC knowledge among GDPs

Respondents were asked to rate their own knowledge of DOACs on a five-point scale ranging from poor to excellent. Overall, 36.3% (n=125) rated their DOAC knowledge as poor to fair, while 63.7% (n=219) rated their knowledge as good to excellent. **Figure 2** shows the comparison between GDP DOAC knowledge rating and their confidence in managing DOAC patients in primary care. As DOAC knowledge increased, GDPs were less likely to refer more complex procedures to secondary care (p=0.001).

### Management of DOAC patients in primary dental care

While 98% (n=337) of GDPs felt that DOAC patients could potentially be managed in primary care, only 18.3% (n= 63) felt that this was possible given the current level of skill, training and resources. Some 28.2% (n=97) felt that additional training was required, while 18.9% (n=65) felt that increased awareness of the SDCEP guidance was necessary. The majority (32.6%, n=112) felt that management in primary care would require a combination of both increased SDCEP guidance awareness and further training. Some 2% (n=7) felt that all patients taking DOACs should be referred to secondary care. **Figure 3** shows the suggestions made by GDPs to facilitate the management of DOAC patients in primary care.

### Referral of patients taking DOACs to secondary care dental settings

A total of 80% (n=275) of the GDPs sampled reported referring DOAC patients to secondary care. Of these referrals, 88.4% (n=243) were classified as high-risk procedure referrals, 7.3% (n=20) as low-risk procedure referrals, and in the

**Table 3: Number of high-risk procedures carried out by GDPs per month.**

Number	Complex extractions	Adjacent extractions that will cause a large wound or more than three extractions at once	Surgical extractions
None	110	84	193
1-3	158	197	112
4-6	38	37	21
7-9	14	9	7
10+	24	17	11

remainder of cases (4.4%, n=12), the GDP was unaware of whether or not the patient was taking DOACs. **Figure 4** shows the variety of services to which GDPs have referred DOAC patients.

Respondents were asked to provide their reasons for referring DOAC patients to secondary care. Some 45.3% (n= 129) expressed the view that secondary care settings are better placed to manage these patients, while 20.4% (n=58) cited inadequate experience. Some 13.3% (n=38) reported referring due to potential complications.

### Comparison of low-risk and high-risk procedures

GDPs were asked to quantify how many low- and high-risk procedures, as classified by the SDCEP guidance, they carried out on a monthly basis. **Tables 2 and 3** show the number of low- and high risk-procedures, respectively, carried out by GDPs per month. GDPs with greater levels of experience with high-risk procedures were less likely to refer DOAC patients to secondary care (p=0.001), while those with lower self-reported confidence levels in undertaking surgical extractions were more likely to refer (p=0.014) (**Figure 5**).

### Significance of gender

Of the 344 respondents, 149 were male and 195 were female. Female GDPs were more likely to be aware of the SDCEP guidance than their male counterparts (p=0.004). Some 81.5% (n=159) of female respondents felt that the guidance was easy to use, in comparison to 67.8% of males (n=101).

### Additional comments

Four GDPs felt that patients should be made aware of the risks associated with dental procedures when taking DOAC medications, while seven mentioned that a secondary care contact in the event of concerns/complications could be a useful resource. Two GDPs made comments about the fear of legal implications being an influencing factor on the willingness of GDPs to manage these patients in general practice.

## Discussion

The vast majority of GDPs (83.7%, n=288) in Northern Ireland are aware of the SDCEP guidance on the management of patients taking anticoagulant or antiplatelet drugs. The majority (98.0%, n=337) believe that patients taking DOACs could potentially be managed in primary care, subject to the provision of appropriate training and increased awareness of the SDCEP guidance. While the results of the study have provided interesting data on GDPs' perceptions of the management of DOAC patients, and identified strategies to facilitate primary care management, a number of limitations exist. Given the

typically low response rates to postal questionnaires, a satisfactory response rate of 30% was achieved, although this still resulted in a relatively small sample size of 344 GDPs. Questionnaires may also have been returned on behalf of dental practices, rather than individual practitioners. Therefore, the findings may be representative of the views of more than 344 GDPs. The potential for response bias in those who opted to complete the questionnaire must also be considered. The self-reporting of data may also have been subject to recall bias, while the self-rating of DOAC confidence and knowledge levels are subjective measures. Seven questionnaires were incorrectly completed and therefore could not be included in the analysis. In addition, a 'multi-method approach' combining questionnaires with interviews is often advocated for this type of study and may have been a useful approach to adopt.<sup>13</sup> However, due to financial and time constraints, this approach was not taken in this instance. The vast majority of reported referrals made to secondary care were for procedures classified as being at higher risk of postoperative bleeding complications in accordance with the SDCEP guidance (**Table 1**). The collected data revealed that the sampled GDPs carry out relatively small numbers of these procedures per month, suggesting that a combination of a lack of confidence and experience with high-risk procedures could be contributing to the high incidence of referral of DOAC patients for higher-risk procedures. This would correlate with the findings of some of the studies previously referenced,<sup>9,10</sup> which suggested that 69% of referrals to secondary care oral surgery services were based on anticipated surgical difficulty, while other contributory factors included complex medical histories, primary care practitioners who did not carry out surgical procedures, and a lack of oral surgery experience during undergraduate training among recent dental graduates.<sup>8,10</sup> This is also supported by the finding of this study, which showed a statistically significant relationship between increasing experience of GDPs in higher-risk procedures and decreasing number of referrals to secondary care ( $p=0.037$ ).

Questionnaire responses revealed that 12% of the procedures referred to secondary care settings presented a low risk of postoperative bleeding complications and 4.4% of GDPs were unaware if a patient had been taking DOAC medication before referral. This highlights the potential for inappropriate referrals to secondary care settings. Inappropriate referrals represent a significant problem within the healthcare system, with significant financial implications. The purpose of the SDCEP guidance is to enable provision of care in the most appropriate setting. While the SDCEP guidance clearly outlines recommended protocols for the management of DOAC patients, it is clear that the publication of such guidance, as an isolated measure, is insufficient in ensuring that these recommendations are fulfilled.

A further consideration regarding the perceived reluctance of GDPs to manage DOAC patients in primary care is the lack of high-quality evidence on the bleeding risks associated with dental procedures in DOAC patients and on the continuation or interruption of DOAC doses for clinical procedures. The SDCEP guidance document states that the recommendations made are conditional and that decisions to interrupt anticoagulant medication are based on very low-quality evidence.<sup>7</sup> The recent introduction of DOACs and the resultant uncertainty regarding their effects is likely to have had an adverse impact on GDPs' perceptions of their own ability to manage these patients in primary care. The lack of availability of reversal agents to counteract the anticoagulant effects of DOACs is also likely to represent a major concern for dental practitioners.

The SDCEP guidance outlines clear protocols for the primary dental care management of DOAC patients. However, the guidance also stipulates that dentists must use their own judgement to determine whether they are sufficiently skilled to complete the procedure and manage consequent peri-operative bleeding. It is clear that GDPs need to be adequately supported to realise this goal. Merely being aware of the guidance does not support the implementation of the recommendations on a practical level, without corresponding training in their use and relevant clinical experience in their application.

The fear of litigation was also reported as a key factor influencing referrals. Cases resulting in litigation have been described in a study by Wahl *et al.*, which concluded that, to minimise the risk of such occurrences, dentists have an obligation to consult prescribing doctors and to educate patients on the bleeding risks associated with dental procedures.<sup>14</sup>

A number of GDPs also felt that a local pharmacy, HSCB, or secondary care advisory contact would support the management of these patients in primary care. This finding is supported by those of a previous study conducted by Lusk *et al.*, which concluded that periprocedural decisions regarding DOAC patients should involve a multidisciplinary approach.<sup>15</sup> The significant difference between female and male GDPs in terms of increased awareness of both the SDCEP guidance and its endorsement by the DoH Northern Ireland correlates with the findings of previous studies, which suggest that female practitioners are more likely to provide guideline-concordant care than their male colleagues.<sup>16,17</sup> In addition, it has also previously been reported that where males are more likely to have greater self-confidence and engage in more risk-taking behaviours, females are more likely to exercise caution when performing challenging procedures through carrying out research or consulting guidelines.<sup>16,17</sup>

A joint professional letter from the Chief Dental Officer and the Chief Pharmaceutical Officer was issued to all Health Service dentists in December 2017 endorsing the SDCEP guidance, in addition to information provided through the General Dental Services (GDS) News Sheet. However, almost a quarter of GDPs who reported being aware of the SDCEP guidance were unaware that this guidance had been endorsed by the DoH Northern Ireland. This would suggest that more effective collaborative approaches between the HSCB and GDPs would contribute to increased clarity among GDPs on locally approved management strategies. While the study focused exclusively on patients registered with the HSCB, it is likely that referral patterns share similarities with DOAC referrals in the private sector, as the same referral pathway is used by both the NHS and private dental practices.

A study published in 2017 found an increase of 58% in the number of first-time oral anticoagulant prescriptions during the period 2009 to 2015. It was found that new DOAC prescriptions increased dramatically during that period, with DOACs accounting for 56% of first-time oral anticoagulant prescriptions in 2015.<sup>4</sup> With the increasing prevalence of thromboembolic disease<sup>3</sup> and the emerging trend in the prescription of DOACs, GDPs are likely to witness an increase in DOAC patients presenting to primary care for routine dental procedures. Addressing the concerns of GDPs in relation to the management of these patients is essential to enable the provision of safe and appropriate care.

## Conclusions

This study has shown that, while most GDPs in Northern Ireland are aware of the SDCEP guidance on the management of patients taking anticoagulant and

antiplatelet drugs, a large majority have referred DOAC patients to secondary care settings for treatment, in contradiction of the recommendations of the guidance. This has been attributed to a lack of confidence and experience in managing these patients successfully in primary dental care.

The findings of this study should be used to address the concerns of GDPs within Northern Ireland relating to the management of patients taking DOACs in primary dental care. The issues raised may well be universal to other regions. Enhanced adherence to the SDCEP guidance should enable the provision of efficient and timely care in the most appropriate setting for these patients, as well as avoiding the overburdening of limited and costly secondary care resources.

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### CPD questions

To claim CPD points, go to the MEMBERS' SECTION of [www.dentist.ie](http://www.dentist.ie) and answer the following questions:



CPD

1. What percentage of referrals to secondary care settings involved procedures with a low risk of postoperative bleeding complications?

- ☐ A: 41%
- ☐ B: 12%
- ☐ C: 24%

2. What percentage of GDPs rated their knowledge of DOAC medication as poor-fair?

- ☐ A: 63.7%
- ☐ B: 36.3%
- ☐ C: 73.6%

3. What percentage of GDPs believed DOAC patients could be managed in primary dental care settings, if additional training was provided?

- ☐ A: 98%
- ☐ B: 11%
- ☐ C: 89%