

The contents of dental implant patient information leaflets available within the UK

J. Barber,¹ J. Puryer,^{*1} L. McNally¹ and D. O'Sullivan¹

VERIFIABLE CPD PAPER

IN BRIEF

- Discusses patient information leaflets, which are designed to provide easy to follow information.
- Reports on an investigation into the content of patient information leaflets about dental implant treatment.
- Highlights the limitations of such leaflets.

Purpose Patient information leaflets are designed to provide easy to follow information summaries and first point of contact information about treatment options. This survey reviewed the content of dental implant patient information leaflets, produced by implant companies and available within the UK in 2011. **Methods** Dental implant companies in the UK were asked to provide samples of their patient information leaflets. The information within the leaflets was then summarised, including the quantity and the types of images used and whether the source of the information was given. Quantitative data was obtained on the amount of information provided, size of images and number of references. **Results** A response rate of 71% was obtained and 23 leaflets were studied. Great variation was found between the leaflets, with the word counts ranging from 88 to 5,434, and 44 different topics were identified. The majority of the images used were decorative, and none of the leaflets gave any reference to the sources of their information. Implant treatment was generally described in a positive way, with an emphasis on describing the treatment and the advantages. Much less information was given about the potential disadvantages and risks of complications or failure, including the relevance of periodontal disease or smoking. **Conclusion** Implant patient information leaflets provided by dental implant companies should not be solely relied upon to provide patients with all the information they need to give informed consent to treatment.

INTRODUCTION

The use of dental implants to provide support and retention for fixed and removable dental prostheses has increased rapidly over recent years.¹ By 2003 there were around 80 worldwide manufacturers, with approximately 220 different implant brands between them.² The dental implant market is highly competitive, and implant companies work hard to promote their products to both clinicians and patients using promotional material to highlight the particular advantages of their systems. Information leaflets are produced by the majority of implant companies to advertise to potential patients.

It has been shown that the level of knowledge about dental implants among the general public is poor.³ Thus, for those patients considering implant treatment, the clinician needs to ensure they have sufficient knowledge and understanding of any proposed treatment. Other sources of information

about dental implants for patients, for example the Internet, may give information that is inaccurate, incomplete or difficult to read. The news media can also give a negative perspective on implants.⁴

Dental implant companies provide promotional material to professionals to distribute to their patients, an important means of advertising which can help increase sales. While implant companies are free to advertise to dentists, there is little advertising directly to patients, and importantly, direct-to-consumer advertising is banned in Europe.⁵

Clinicians already effectively use leaflets to assist when informing patients about implant treatment.⁶ Studies have shown that patients often forget or misunderstand the information they have been given by a clinician,^{7,8} and the provision of written material can increase the amount of information retained.⁹ However, care must be taken not to overload a patient with information, nor provide inadequate information.¹⁰

If the information contained within the leaflet is of good quality and comprehensive, the clinician would be able to rely on it to back up their discussions with the patient. The clinician would be able to document in a patient's notes that they have been given a particular leaflet. This could be used as

evidence if there is a complaint about the lack of information provided to a patient before commencing treatment.⁷ The use of detailed information leaflets which could be used as a defence in potential malpractice lawsuits have been advocated.¹¹ Often written patient information is not referenced and does not give an indication of the strength of evidence to support the information that is being provided which makes verifying the scientific quality of the information more difficult.¹² There is also a potential for bias within the patient information leaflets produced by commercial manufacturers, and information leaflets available in general dental practices have been found to have limitations.¹³

For a patient information leaflet to be effective it must be well designed,¹⁴⁻¹⁸ and its layout is important in determining how usable it is.¹⁹ Many leaflets have illustrations to accompany the text. Past literature has shown that text with illustrations can be more effective than using text or illustrations alone, especially for patients with low literacy skills.²⁰ The age of the person reading the information is a relevant factor and illustrations may not be beneficial for older patients.²¹ Others have found illustrations in hand-outs to be ineffective in improving patients' recall of information and that

¹School of Oral and Dental Sciences, Bristol Dental Hospital, Lower Maudlin Street, Bristol, BS1 2LY

^{*}Correspondence to: Dr James Puryer

Tel: +44 (0)117 342 4184; Fax: +44 (0)117 342 4443

Email: james.puryer@bristol.ac.uk

Online article number E7

Refereed Paper – accepted 22 December 2014

DOI: 10.1038/sj.bdj.2015.99

©British Dental Journal 2015; 218: E7

the patients' level of education was a more important factor.²²

It is clear that patient leaflets should be well designed, containing sufficient, good quality information, and it is evident that there is a potential challenge in designing leaflets that incorporate the differing interests of all parties involved. The dental implant companies who produce them wish to have attractive and appealing written material that promotes their product in the best possible light. The dental professionals wish to give their patients clear, balanced and detailed information. Patients would like information which answers the questions important to them, in a way which is easy to read and understand.

AIM OF STUDY

The aim of this study was to compare the material contained within dental implant information leaflets produced by implant companies within the UK. The objectives included:

- Which topics are discussed?
- How much information is there in each leaflet and on each topic?
- What images are used?
- What are the primary claims made by implant companies about the treatment and why a patient should choose to have that treatment?
- Are the sources of information referenced?

METHODS

Collection of data

The inclusion criteria for the study was 'written patient information literature produced by dental implant companies in the period of March–May 2011'. A list of dental implant companies and distributors operating in the UK and their contact details was compiled using three methods:

1. Internet search for websites for dental implant manufacturers and distributors worldwide. If the website had contact information for a UK sales or UK customer services operation, the details were recorded. The websites of dental implant associations were also searched for lists of implant companies
2. The UK dental free press was searched for advertisements from dental implant companies
3. Dental implant company representatives were approached and samples of their company's patient information literature requested.

Each company was sent an email requesting an example of their current written patient information literature. If after two weeks there was no response, the email was followed up

Table 1 Information leaflet topic and the combined total number of words devoted to each topic. Those highlighted indicate those which were selected for further analysis

| Topic | Total number of words | Topic | Total number of words |
|---|-----------------------|--|-----------------------|
| Importance of a smile | 150 | Temporisation | 63 |
| Why might you want dental implants | 1,409 | Treatment procedure and timeframe | 3,346 |
| Description of dental implants and what they do | 1,960 | Costs | 421 |
| Advantages of implant treatment | 2,064 | Aftercare of implants and prostheses | 1,330 |
| Description of how implants support different types of prostheses | 2,914 | Description of a sinus lift | 81 |
| Disadvantages of alternative treatment options | 1,103 | Description of a ridge split | 91 |
| Comparison of treatment options | 274 | Description of a bone graft | 233 |
| Description of alternative treatment options | 625 | For further information: go to company website | 283 |
| Advise to consult a dentist for an individual treatment plan | 736 | Introduction to brochure | 202 |
| Description of example cases | 217 | Where can I go to have dental implants placed? | 96 |
| Case testimonies | 2,466 | Aesthetic improvements to remaining natural teeth | 85 |
| Information about implant system and manufacturer | 2,096 | Materials for crowns | 85 |
| Risks at placement | 129 | Preparation for implant consultation | 82 |
| Loading protocols | 194 | Day-surgery procedure; Surgery under LA in practice; Is a GA required? | 166 |
| Description of trans-mucosal healing | 66 | How long implants last? | 82 |
| Description of submerged healing | 66 | Foreign body feeling | 43 |
| Airport security | 60 | Immediate implant placement | 251 |
| Suitability for implant treatment | 977 | Implant material | 163 |
| Implant as an alternative to RCT | 87 | Risk of implant infection | 46 |
| Biocompatibility | 247 | Replacement and modification of denture | 168 |
| Smoking | 77 | Sport – rest after placement; Work – after placement | 94 |
| Discomfort | 163 | Technician makes custom prosthesis | 17 |

with a letter addressed to the company. If there was no reply to this letter within a four week period, a result of 'no response' was recorded.

When the information material was received it was checked to see if it met the above inclusion criteria. If numerous leaflets from one company met the criteria, they were all included and treated as separate leaflets. Each leaflet that was eligible for the study was then analysed. A combination of qualitative and quantitative analysis of the contents of the written patient information material was chosen in order to demonstrate what the leaflets contained and the quantity of each item. As the emphasis of this study was upon the information itself, and not how it was consumed by patients, readability tests were not

used. All of the data was extracted from the leaflets by a single author to aid reliability.

Topics

Each paragraph or block of text was read and the topic recorded. The number of words contained in each paragraph or block of text was also recorded. All the topics on a similar subject were then grouped together. If the topic did not fit within a group, further topic groups were made. In this way each topic group was representative of the content of the paragraph or block of text.

Claims

The primary claims made by each company about the benefits of dental implant

Table 2 The percentage of total surface area of each leaflet devoted to decorative and informative images

| | Percentage of total area of leaflets devoted to other content decorative images | Percentage of total area of leaflets devoted to other content informative images | Percentage of total area of leaflets devoted to other content (eg text & background) |
|------------------|---|--|--|
| Astra Tech 1 | 21 | 3 | 76 |
| Astra Tech 2 | 21 | 6 | 73 |
| Astra Tech 3 | 21 | 4 | 75 |
| Astra Tech 4 | 24 | 4 | 72 |
| Astra Tech 5 | 24 | 4 | 72 |
| Bicon | 8 | 11 | 81 |
| BioHorizons 1 | 7 | 16 | 77 |
| BioHorizons 2 | 7 | 10 | 83 |
| Biomet 3i | 8 | 7 | 85 |
| Dentsply Frident | 5 | 7 | 88 |
| Euro teknika | 9 | 13 | 78 |
| Implantium | 9 | 11 | 80 |
| Neoss | 18 | 6 | 76 |
| Nobel Biocare 1 | 25 | 4 | 71 |
| Nobel Biocare 2 | 25 | 6 | 69 |
| Nobel Biocare 3 | 21 | 10 | 69 |
| Nobel Biocare 4 | 25 | 7 | 68 |
| OsteoCare 1 | 15 | 2 | 83 |
| OsteoCare 2 | 22 | 7 | 71 |
| Osteo-Ti 1 | 55 | 0 | 45 |
| Osteo-Ti 2 | 26 | 2 | 72 |
| Straumann 1 | 3 | 5 | 65 |
| Straumann 2 | 19 | 3 | 78 |

treatment or advantages of their dental implant system were recorded. These claims could then be compared to current scientific literature on the subject to test their validity.

Number of references

All of the leaflets were assessed to see if any sources for the information they contained was given. This would include references to scientific journal articles, books or company research. This would show where the information came from, so that the validity could be verified.

Photographs and diagrams

The total area of each leaflet was calculated by measuring the dimensions in square centimetres (cm²). The number and area of each image in each leaflet was recorded in square centimetres (cm²). The images were divided into six categories.

1. Photographs of smiling people or people eating happily
2. Decorative photographs: other pleasant images not directly relevant to dental implants
3. Photographs of models representing different types of possible patients
4. Photographs of treatment cases, such as 'before and after' photographs
5. Other informative photographs, such as prostheses or clinical situations
6. Descriptive diagrams to help explain the treatment, such as dental implants, or implant-retained overdentures.

RESULTS

Collection of leaflets

The search for dental implant companies, which have a UK sales and/or customer services department identified 17 contactable

companies. Most of the implant companies which were contacted as part of the study responded rapidly and sent examples of their patient information leaflets. Four companies did not have any patient leaflets available, and one company only had a draft leaflet that was not available in the UK.

Patient information leaflets which met the inclusion criteria were received from 12 of the 17 companies contacted, giving a response rate of 71%. Some of these companies produced a single leaflet, while others produced a range of leaflets. Twenty-three leaflets were included in the study, and the distribution of these leaflets from the various companies is shown below.

- 1 leaflet: Bicon, Biomet 3i, Dentsply, Euro teknika, Implantium, Neoss
- 2 leaflets: BioHorizons, OsteoCare, Osteo-Ti, Straumann
- 4 leaflets: Nobel Biocare
- 5 leaflets: Astra Tech.

Topics discussed in the information leaflets: overall

The leaflets were all analysed and a very wide range of 44 different topics were identified. However, information about periodontal disease and its relevance to implant treatment was not present in any of the leaflets. Twenty-five of the 44 topics were mentioned in only one or two leaflets. Some topics would not be relevant to all potential implant patients (for example, 'description of a sinus lift'). The presence of each topic was recorded for each leaflet, as well as the number of words devoted to each topic. These topics, along with the total number of words devoted to each topic, are listed in Table 1. From the 44 topics, 15 were identified for further analysis. These were deemed to be of greater importance and have been highlighted. The importance of each topic was estimated by calculating the total number of words devoted to each topic by all the leaflets. Topics which had more than 300 words were selected, as well as 'importance of a smile' as it is a strong motivational factor for patients to seek dental implant treatment and 'smoking' due to its importance as a risk factor for dental implant failure. The popularity of each of the 15 selected topics was analysed. The most popular topics which were written about in the leaflets were:

- Why might you want dental implants
- Description of dental implants and what they do
- Advantages of implant treatment
- Description of how implants support different types of prostheses
- Advice to consult a dentist for an individual treatment plan
- Description of the treatment procedure and timeframe.

The least frequently mentioned topic was 'smoking', which should have been present in the majority of the leaflets.

Topics discussed in the information leaflets: individual leaflet

At least one of the 15 selected topics was included in all the leaflets, though some contained many more than others.

Information contained in each leaflet: overall

The number of words contained in each leaflet and per topic was calculated. The larger the amount of text in the leaflets, the more information they are likely to contain. From the individual 23 leaflets studied, the word count ranged from 88 to 5,434 words (mean = 1,119).

Information contained in each leaflet and on each topic: individual leaflet

The total of number of words per leaflet and per topic give an overall indication of the amount of information present, but does not clearly demonstrate the variation between the leaflets on the amount of information given about each of the selected topics highlighted in Table 1. None of the leaflets contained information on all of the 15 selected topics, and for these 15 selected topics, the maximum number of words ranged from 45 to 1,145 (mean = 447).

Images used in the leaflets

Six distinctive types of images were used in the leaflets. These can be broadly grouped into *decorative* and *informative* images.

Images were an important element in the composition of the leaflet designs, accounting for over 20% of the total surface area of the majority of the leaflets. *Decorative* images took up a larger area of each leaflet than *informative* images, in the majority of the leaflets. The leaflet Osteo-Ti 1 contained no *informative* images and over 50% of the total area of the leaflet was given over to *decorative* images. All the other leaflets contained some *informative* images. The proportion of the total surface area of each leaflet devoted to *decorative* and *informative* images is demonstrated in Table 2.

The most commonly used type of image across all the leaflets were those in the 'happy people/smiles' category, depicting people with a lifestyle, self-confidence and masticatory ability to which potential implant patients are likely to aspire. Descriptive diagrams were the second most used images. Table 3 shows the proportion of the total area of images in each leaflet which were devoted to the different types of images.

Table 3 Proportion of the total area of images in each leaflet devoted to the different types of images

| | Proportion of images which were descriptive diagrams | Proportion of images which were informative photographs | Proportion of images which were photograph of example cases | Proportion of images which were of characters | Proportion of images which were decorative photographs | Proportion of images which were of happy people or smiles |
|------------------|--|---|---|---|--|---|
| Astra Tech 1 | 0.14 | 0 | 0 | 0 | 0 | 0.86 |
| Astra Tech 2 | 0.21 | 0 | 0 | 0 | 0 | 0.79 |
| Astra Tech 3 | 0.16 | 0 | 0 | 0 | 0 | 0.84 |
| Astra Tech 4 | 0.13 | 0 | 0 | 0 | 0 | 0.87 |
| Astra Tech 5 | 0.10 | 0.04 | 0 | 0 | 0 | 0.86 |
| Bicon | 0.08 | 0 | 0.51 | 0 | 0 | 0.41 |
| BioHorizons 1 | 0.59 | 0 | 0.10 | 0 | 0 | 0.31 |
| BioHorizons 2 | 0.59 | 0 | 0 | 0 | 0 | 0.41 |
| Biomet 3i | 0.24 | 0.23 | 0 | 0 | 0 | 0.53 |
| Dentsply Frident | 0.45 | 0.16 | 0 | 0.25 | 0.08 | 0.07 |
| Euro teknika | 0.58 | 0 | 0 | 0 | 0 | 0.42 |
| Implantium | 0.52 | 0 | 0.04 | 0 | 0 | 0.45 |
| Neoss | 0.24 | 0 | 0 | 0 | 0.09 | 0.67 |
| Nobel Biocare 1 | 0.13 | 0 | 0 | 0 | 0 | 0.88 |
| Nobel Biocare 2 | 0.20 | 0 | 0 | 0 | 0 | 0.80 |
| Nobel Biocare 3 | 0.18 | 0.14 | 0 | 0 | 0 | 0.69 |
| Nobel Biocare 4 | 0.22 | 0 | 0 | 0 | 0 | 0.78 |
| OsteoCare 1 | 0.12 | 0 | 0 | 0 | 0 | 0.88 |
| OsteoCare 2 | 0.23 | 0 | 0 | 0 | 0 | 0.77 |
| Osteo-Ti 1 | 0 | 0 | 0 | 0 | 0.44 | 0.56 |
| Osteo-Ti 2 | 0 | 0.07 | 0 | 0 | 0 | 0.93 |
| Straumann 1 | 0.14 | 0 | 0 | 0 | 0.03 | 0.83 |
| Straumann 2 | 0.13 | 0 | 0 | 0 | 0.01 | 0.86 |

Claims made in information leaflets

The main claims which were made by each company about implant treatment, and the reasons for choosing implants and their system were recorded for each leaflet. Many of the claims were common to numerous companies' leaflets and a few were isolated to particular implant systems. The common claims fell into six general categories:

- Claims about implants
- Problems caused by missing teeth
- Advantages of implant treatment
- Advantages of implant-retained overdentures
- Disadvantages of dentures
- Implant aftercare.

As there is a degree of consensus about these claims across the sample group of information leaflets, they were collated and

summarised in Table 4.

Some claims were only made by individual implant companies in their implant information leaflets. These were claims specifically about their implant system or claims about the benefits and advantages of implant treatment, which other implant companies had not made. Some claims were potentially more contentious.

Sources of the information contained in each leaflet

None of the leaflets contained any references as to where their information originated. Discussion The results clearly show that there is a wide range of variation in the substance and quantity of information contained in dental implant patient information leaflets available in the UK. Some give relevant information about a wide range of topics which would be of

Table 4 Summary of claims made by implant companies in their information leaflets – General

| General claims | |
|---|--|
| Claims about implants | Implant can replace missing teeth Implants have been used for more than 40 years Scientifically proven long term success by independent research Implants have a success rate of over 96% Implants are made of biocompatible materials An implant can last a lifetime, with proper care and good oral hygiene. Implants cannot be distinguished from your real teeth in function or appearance |
| Problems caused by missing teeth | Missing teeth make you self-conscious about your appearance; you may even stop laughing and smiling spontaneously Losing your teeth causes the shape of your face to change, causing you to look prematurely aged. Implants help you to maintain a youthful appearance Missing teeth stops you eating many of the foods you enjoy. Implant treatment restores chewing allowing improved diet and digestion |
| Advantages of implant treatment | Implant treatment restores your natural smile Implants give improved quality of life, by giving back confidence, dignity, self-esteem Adjacent teeth do not need to be prepared for bridge abutments When kept in good oral hygiene implants can last longer than bridges or prostheses, therefore implants provide a more economical long-term solution Anchoring dental implants in the jawbone stimulates bone tissue and gums, ensuring an attractive, aesthetic result, while helping to maintain facial structures |
| Advantages of implant retained overdentures | Implants can stabilise dentures, making them more comfortable Implant treatment can often use the existing denture Implant treatment removes the need for denture adhesives |
| Disadvantages of dentures | Conventional dentures can be painful, inconvenient, awkward, may affect how you pronounce words, and stop you eating some foods Due to ill-fitting dentures patients withdraw from social engagement, leaving them with reduced confidence and low self-esteem Majority of people suffer a great deal of discomfort from wearing loose or ill-fitting dentures |
| Implant aftercare | Implants are taken care of just like natural teeth Sonic and electric toothbrushes can be more effective than ordinary toothbrushes for cleaning teeth and implants |

interest to a patient considering implant treatment, while others only provide a very brief introduction to dental implants. These topics could be considered the main selling points for implant treatment and it is therefore understandable that the implant companies would concentrate on them. Much less is written about other important topics such as 'description of alternative treatment options', 'smoking' and 'cost', which may act as a disincentive for a patient considering implant treatment.

The general claims made by implant companies about dental implant treatment are mostly supported by the literature, although often from a positive perspective regarding implant treatment. There are some company-specific claims which would not appear to be supported by the literature. None of the leaflets contained any references to the sources of their information. It was therefore not possible to verify the validity of the information or compare it with that which was found by searching published papers in peer-reviewed journals.

There was a wide variation in the number of leaflets in which each topic was selected to be included. The most popular topic was 'description of dental implants and what they do', and as this is the most

fundamental information about implant treatment and it is understandable that it is commonly included. 'Risks at placement', 'smoking', 'how long implants last', and 'risk of implant infection' are important topics for informed consent and avoiding later patient dissatisfaction with treatment. These may be omitted from the leaflets so that patients are not discouraged from seeking implant treatment.

Images form an important part of the leaflets, taking up approximately a quarter of the total area of the majority of the leaflets. The majority of the leaflets have a larger proportion of their total area devoted to *decorative* images than to *informative* images, and understandably tried to link implant treatment with a lifestyle patients are likely to aspire to. This gives an indication of the relative importance of the leaflets as a means of marketing dental implants as opposed to informative tools to the implant companies which produce them. Of the different types of images the most commonly used were: photographs of happy people/smiles and descriptive diagrams. The photographs of happy people/smiles are the most popular because they underlie the primary motivations for seeking implant treatment.

Commonly, photographs of people biting into apples are used to demonstrate that foods which can be difficult to eat with dentures or missing teeth can be enjoyed following implant treatment. The descriptive diagrams are useful to help patients understand what is involved in implant treatment. Cut away diagrams of an implant in an alveolar ridge or an exploded diagram of an implant, abutment and crown fitting together are good examples of helpful images which are commonly used.

The claims made about dental implants in the written patient information material included in this study are generally correct. There are many articles in peer-reviewed scientific journals that show a good success rate for dental implants over a 10-year period. This independent research backs the statement made in many of the leaflets that dental implants have scientifically-proven, long-term success. Some of the information leaflets give a success rate of over 96% for dental implants. Of more relevance to the individual patient is the success rate of implants placed by their own dental surgeon, and their own personal risk factors for implant failure. This is the information that their dentist should be giving them, and the figures given in the leaflets give a more general indication of internationally reported success rates. The claim that an implant can 'last a lifetime' with proper care and good oral hygiene is difficult to prove, and this would appear to be an optimistic claim, which cannot be fully backed by current scientific findings.

Another bold claim made by a number of implant companies is that implants cannot be distinguished from your real teeth in function or appearance. However, there is a significant difference in the threshold of tactile sensitivity between teeth replaced by dental implants and natural teeth.²³ It is possible to replace missing teeth with implant-retained restorations which have an appearance very similar to natural teeth, but this can be difficult. A meta-analysis of published data on implant-supported single crowns revealed that the cumulative rate of crowns having unacceptable or semi-optimal aesthetic appearance was 8.7%.²⁴ In cases where such aesthetic failures have occurred, the teeth would be clearly distinguishable from real teeth.

Many of the leaflets highlight the possible problems which can be experienced by patients when teeth are lost. This is to encourage patients to undergo dental implant treatment and also forms part of the informed consent process for implant treatment. They list the reasons why implant treatment should be considered and some of the consequences

of not having the treatment. There are psychological, functional (physical) and social problems which patients experience when teeth are lost. It is important for prospective patients to realise that there are potential physical, functional and psychological benefits to dental implant treatment, as well as the aesthetic improvements which are often the only element emphasised.

The other problem which was commonly stated was the changes to the face that can follow the loss of teeth, which can give the appearance of premature aging. Tooth loss does contribute to skeletal changes in the mid-face region. However, the ability of implant treatment to prevent premature aging should not be overstated, and a recent review paper found that dental implants do not have an active role in the preservation and maintenance of alveolar bone height.²⁵

The aftercare of implants was addressed by some, but not all, of the implant companies. It is vitally important for the long-term success of the treatment and prospective patients should be aware of their obligations in this regard from the early stages of treatment planning.

CONCLUSIONS

There is great variation in the quantity and quality of the information provided in UK dental implant patient information leaflets. If a leaflet provides a good range and depth of information to patients, it will support the information that is given verbally or by other means. Clinicians need to know how reliable the information leaflet which they give to their patients is. If the information leaflet is weak, the shortcomings must be compensated for in other ways. Some leaflets contain statements which are not fully supported by studies published in scientific journals. A patient will assume that a dentist concurs with all that is written in an information leaflet that is given to them by that person unless stated otherwise. The descriptive diagrams and photographs of example

cases are a useful aid in explaining dental implant treatment, which can prove difficult for patients to fully understand.

Dentists have a moral and legal obligation to obtain informed consent before implant treatment. None of the leaflets provide sufficient information to fully inform a patient. Informed consent requires information about the proposed procedure, the potential risks and benefits, alternative procedures, the effect of not having treatment, the diagnosis, a prognosis and progress of treatment. Some leaflets in this study provided very little information and would not be useful in gaining informed consent. The more comprehensive leaflets would be a good additional source of information about the procedure and the benefits, with some limited information on alternative treatments and prognosis of treatment. The available leaflets generally do not provide information about the risks of treatment. Due to this wide range in the quantity and quality of the information provided, dental implant patient information leaflets should not be solely relied upon to provide patients with sufficient information to give informed consent to treatment.

1. Stillman N, Douglass C. The developing market for dental implants. *J Am Dent Assoc* 1993; **124**: 51–56.
2. Jokstad A, Braegger U, Brunski A, Naert I, Wennerberg A. Quality of Dental Implants. *Int J Prosthodont* 2004; **17**: 607–641.
3. Tepper G, Haas R, Mailath G *et al*. Representative marketing-oriented study on implants in the Austrian population. I. Level of information, sources of information and need for patient information. *Clin Oral Implants Res* 2003; **14**: 621–633.
4. Berge T I. Public awareness, information sources and evaluation of oral implant treatment in Norway. *Clin Oral Implants Res* 2000; **11**: 401–408.
5. Gilbody S, Wilson P, Watt I. Benefits and harms of direct to consumer advertising: a systematic review. *Qual Saf Health Care* 2005; **14**: 246–250.
6. Barkhordar A, Pollard D, Hobkirk J. A comparison of written and multimedia material for informing patients about dental implants. *Dental Update* 2000; **27**: 80–84.
7. Kenny T, Wilson R G, Purves I N *et al*. A PIL for every ill? Patient information leaflets (PILs): a review of past, present and future use. *Fam Pract* 1998; **15**: 471–479.
8. Makaryus A N, Friedman E A. Patients' understanding of their treatment plans and diagnosis at discharge. *Mayo Clin Proc* 2005; **80**: 991–994.
9. Gauld V A. Written advice: compliance and recall. *J R Coll Gen Pract* 1981; **31**: 553–556.
10. Dey A. Consumer health informatics: an overview of patient perspectives on health information needs. *HIM J* 2004; **33**: 121–126.
11. Santoro V, DeDonno A, Dell'Erba A, Introna F. Esthetics and implantology: medico-legal aspects. *Minerva Stomatol* 2007; **56**: 45–51.
12. Clerehan R, Buchbinder R, Moodie J. A linguistic framework for assessing the quality of written patient information: its use in assessing methotrexate information for rheumatoid arthritis. *Health Educ Res* 2005; **20**: 334–344.
13. Newton J T. The readability and utility of general dental practice patient information leaflets: an evaluation. *Br Dent J* 1995; **178**: 329–332.
14. Gal I, Prigat A. Why organizations continue to create patient information leaflets with readability and usability problems: an exploratory study. *Health Educ Res* 2005; **20**: 485–493.
15. Payne S, Large S, Jarrett N, Turner P. Written information given to patients and families by palliative care units: a national survey. *Lancet*, 2000; **355**: 1792.
16. Meade C D, Byrd J C, Lee M. Improving patient comprehension of literature on smoking. *Am J Public Health* 1989; **79**: 1411–1412.
17. Buchbinder R, Hall S, Grant G, Mylvaganam A, Patrick M R. Readability and content of supplementary written drug information for patients used by Australian rheumatologists. *Med J Aust* 2001; **174**: 575–578.
18. Newton J T. The readability and utility of general dental practice patient information leaflets: an evaluation. *Br Dent J* 1995; **178**: 329–332.
19. Pander Maat H, Lentz L. Improving the usability of patient information leaflets. *Patient Educ Couns* 2010; **80**: 113–119.
20. Houts P S, Doak C C, Doak L G, Loscalzo M J. The role of pictures in improving health communication: A review of research on attention, comprehension, recall, and adherence. *Patient Educ Couns* 2006; **61**: 173–190.
21. Liu Y, Doucette W R. Does direct-to-consumer advertising affect patients' choice of pain medications? *Curr Pain Headache Rep* 2008; **12**: 89–93.
22. Henry E, Brown T, Bartlett C, Massoud E, Bance M. Informed consent in otologic surgery: prospective randomized study comparing risk recall with an illustrated handout and a non-illustrated handout. *J Otolaryngol Head Neck Surg* 2008; **37**: 273–278.
23. Hämmerle C H, Wagner D, Bragger U *et al*. Threshold of tactile sensitivity perceived with dental endosseous implants and natural teeth. *Clin Oral Implants Res* 1995; **6**: 83–90.
24. Jung R E, Pjetursson B E, Glauser R, Zembic A, Zwahlen M, Lang N P. A systematic review of the 5-year survival and complication rates of implant-supported single crowns. *Clin Oral Implants Res* 2008; **19**: 119–130.
25. O'Neill J E, Yeung S C. Do dental implants preserve and maintain alveolar bone? *J Invest Clin Dent* 2011; **2**: 229–235.