

# An Oral Hygiene Brochure for Your Implant Overdenture Patients

Joanna Mok, BSc, DMD; Elham Emami, DDS, MSc; Taira Kobayashi, DDS, PhD;  
Jocelyne S. Feine, DDS, HDR

## Contact Author

Dr. Feine  
Email: [jocelyne.feine@mcgill.ca](mailto:jocelyne.feine@mcgill.ca)



## ABSTRACT

Although there may not be a direct association between oral hygiene and implant failure, oral hygiene must be maintained around implants in the edentulous mouth. Bacterial plaque on dentures can act as a reservoir for pathogens that cause respiratory disease. Unfortunately, many edentulous patients have poor oral hygiene. In this article, we describe the development of a brochure to educate patients wearing mandibular overdentures supported by 2 implants as a supplement to the dentist's verbal instructions. Dental literature and several specialists were consulted during preparation of the brochure, which contains photographs accompanying oral hygiene instructions. It was sent to 25 participants who were subsequently called and questioned regarding its content and their oral hygiene habits. The 24 respondents found the brochure useful; most reported that they would keep the brochure for future reference and that they learned something new about how to maintain their implants properly. No one found the brochure too long or unclear. Most participants read the brochure entirely, rather than skimming it. The brochure is available to all clinicians who wish to incorporate this tool into their implant overdenture therapeutic approach.

For citation purposes, the electronic version is the definitive version of this article: [www.cda-adc.ca/jcda/vol-73/issue-8/713.html](http://www.cda-adc.ca/jcda/vol-73/issue-8/713.html)

The importance of oral hygiene for maintaining optimal oral and systemic health cannot be overemphasized. Although there may not be a direct association between oral hygiene and implant failure,<sup>1</sup> oral hygiene must be maintained around implants in the edentulous mouth. Bacterial plaque on dentures can be a reservoir for pathogens that cause respiratory disease, such as aspiration pneumonia.<sup>2,3</sup> Unfortunately, elderly people generally have poor oral health.<sup>4</sup> In particular, most denture wearers fail to keep their dentures clean, leading to oral diseases such as denture stomatitis.<sup>4,5</sup> Many people may not know how to keep their dentures clean.<sup>4</sup> As well, older people may have less manual

dexterity due to arthritis and may be unable to see plaque due to poor vision.<sup>6</sup> Although dentists usually give verbal instructions on how to maintain implant overdentures, not all patients can remember the instructions due to various factors, such as stress, confusion or their declining memory, nor can all appreciate the importance of oral hygiene.<sup>4,7</sup> Furthermore, as people age, they may become unable to take care of their own oral health and, instead, depend on caregivers. According to some studies,<sup>8,9</sup> mild cognitive impairment occurs in 36.1% of elderly patients in general hospitals and about 23% of those aged 65 or older in the community. Even without

cognitive impairment, most people remember less than a quarter of what they hear.<sup>10</sup>

As mandibular overdentures supported by 2 implants are now considered to be superior to conventional dentures for the rehabilitation of the edentulous mandible,<sup>11</sup> more and more edentulous people will be challenged to keep both their implants and their dentures clean. Written information has been shown to improve patient knowledge, adherence and therapeutic outcome.<sup>12-14</sup> Thus, there is a need to provide written instructions to the patient or to a family member or caregiver who provides oral health care to the patient.

Improved information retention can be achieved when written and visual material is provided to a patient in addition to the standard verbal instructions.<sup>7,10,12,13</sup> As an adjunct to verbal instructions, written information is also highly effective in achieving improved clinical outcomes and compliance.<sup>10,12-14</sup> In 2001, Blinder and colleagues<sup>15</sup> concluded that verbal instructions alone given after oral surgical procedures were insufficient and that written instructions were compulsory to reduce postoperative stress and complaints and to increase patient satisfaction. Furthermore, children receiving a written individualized home-management plan had fewer acute asthma events and fewer lost school days than those who received the standard asthma therapy and education.<sup>16,17</sup> Written information has also been shown to improve knowledge about mouth cancer, to reduce distress and to increase willingness to have the mouth screened for cancer.<sup>10</sup>

Providing an oral hygiene brochure for patients to take home may improve their oral hygiene and help them remember the instructions given by the dentist. Despite the potential usefulness and need for written information on oral hygiene with mandibular implant-supported dentures, we were unable to find such material. Therefore, our goal was to provide a reference on oral hygiene that edentulous patients would regard as useful. We wanted to improve retention of the verbal instructions given to the patient by the dentist, thereby increasing compliance with oral hygiene; to provide a written reference that would assist the caregiver and patient in performing oral hygiene procedures; and to provide patient information that is easy to see, understand and read.

In this paper, we describe the method used to prepare a brochure that would meet these objectives. The brochure, which was later translated into French, appears in [Appendix 1](#).

## Methods

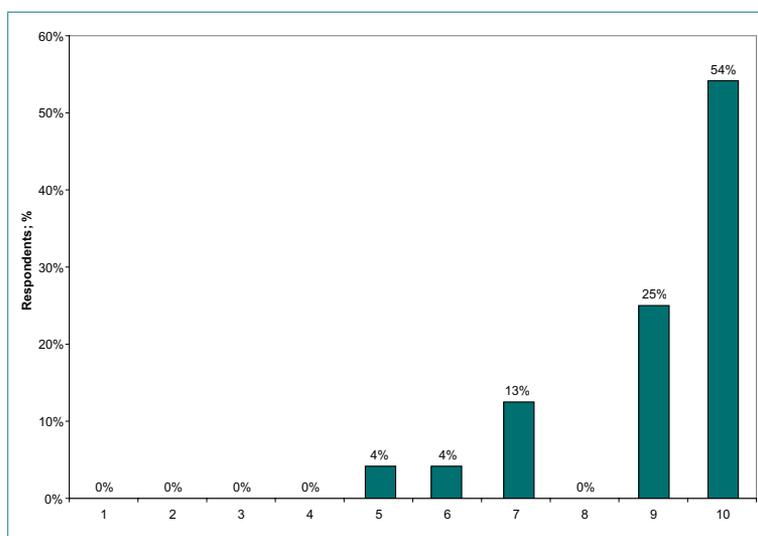
A review of the literature on the maintenance of dental implants and dentures was performed using the following keywords: oral

hygiene, implants, overdentures, dentures. PubMed was searched for journal articles and major implant and periodontology textbooks were reviewed for relevant information. Following this, simplified steps to oral hygiene were described and photographs were taken to illustrate these steps. The camera used was a digital Olympus Camedia E-10 with MCON-35 Macro Extension Lens and Sunpak DX12R Ring flashgun. Four prosthodontists, 2 periodontists and 1 hygienist, who are experienced in implant dentistry, were consulted and modifications were made based on their comments. We aimed to offer material at an easy reading level, with large text and many photographs. An optometry student was consulted regarding the use of colours that would be clearly visible.

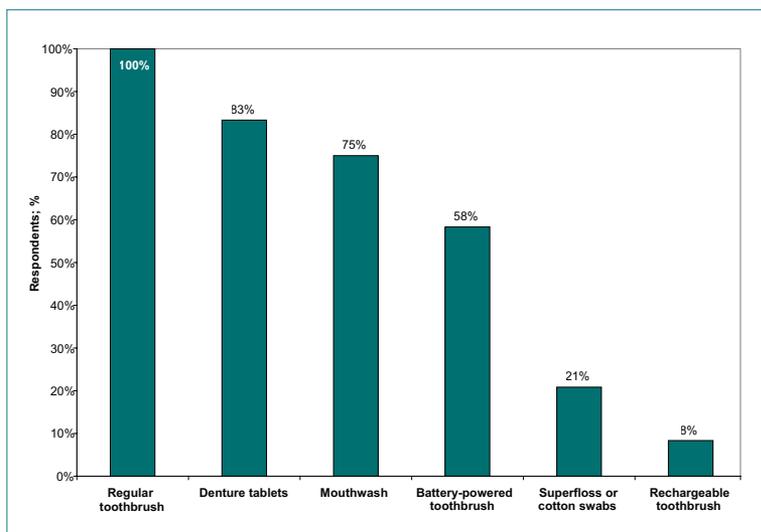
A qualitative research approach was used to test the brochure's acceptability. Twenty-five (15 men; 10 women) English-speaking elderly people wearing mandibular overdentures supported by 2 implants were recruited from a cohort of edentulous seniors who participated in a randomized clinical trial at McGill University. After consenting to participate, each person was sent a copy of the brochure, then telephoned several days later and questioned regarding their oral hygiene habits, as well as the readability and effectiveness of the brochure. All interviews were carried out by the same person (J.M.) and consisted of 25 predetermined questions ([Appendix 2](#)).

## Results

Responses were obtained from 24 of the 25 people who agreed to participate; 1 person could not be reached. The age range of the participants was as follows: 9 were 65-70 years of age, 8 were 71-75 and 7 were 86-90. No participant indicated that any of the material was



**Figure 1:** Self-reported usefulness of the brochure ( $n = 24$ ) where 1 = not useful at all and 10 = very useful.



**Figure 2:** Percentage of respondents expressing willingness to buy products recommended for oral hygiene.

**Box 1** Sample comments by participants after reading the brochure

“The brochure made clear the urgency of making sure that your dentures are clean for the health of the gums.”

“I never noticed the white formation around the implant before reading the brochure; how come you didn’t send it before?”

“I look at my implants more carefully now, and I brush more often now.”

“Interesting, well done, clear.”

“No one told me about cleaning regularly or about plaque, but I’m very happy, I can eat nuts, carrots — everything.”

“I keep it in my medicine cabinet.”

“I was afraid to brush before, I didn’t know you had to brush them!”

unclear. Among the 24 respondents, 96% said that it was very important to them to keep their implants and dentures clean; 79% rated the brochure 9 or 10 on a scale of 1 to 10 for “usefulness” (Fig. 1); 96% said that they would keep it as a reference.

Over half (58%) of the participants reported that they learned something new about how to keep their dentures clean. Most (75%) said they learned something new about how to maintain their implants properly and 79% believed their dentist spent enough time on oral hygiene instructions.

In terms of readability, 96% of patients understood all the words in the brochure and said that the text was large enough to read. One person mentioned that she could read it without her reading glasses! All patients thought

that the brochure was the right length and that it provided sufficient detail. Some participants’ comments are listed in **Box 1**.

After reading the brochure, all participants said that they would buy a regular toothbrush and 58% indicated that they would purchase a battery-powered toothbrush (Fig. 2). Only 8% said that they would buy a rechargeable toothbrush. Twenty-one percent said that they would buy superfloss. Most use mouthwash (75%) and denture tablets (83%).

Most (83%) participants reported that they had read the entire brochure, rather than just skimming it. To test recall of the information in the brochure, they were asked, “What is the recommended check-up interval?” Seventy-five percent were able to answer correctly.

**Discussion**

We developed this brochure to increase awareness of the importance of oral hygiene procedures, to help patients remember the verbal instructions given to them and to provide patients with an easy-to-read reference that they could take home. The brochure can also be used as a tool to assist dentists as they educate their patients in the care of their implant overdentures. The brochure consists of diagrams and instructions highlighting aspects of brushing, flossing, wiping and soaking. In addition, we provided information on the rationale for follow-up visits and motivation.

This brochure is not intended to replace verbal instructions; it should be used as an adjunct to the verbal instructions given in the dentist’s office. Verbal instructions allow the dentist to tailor approaches to the individual patient, which is important to achieve ideal compliance.<sup>16,17</sup> Previous studies have shown that comprehension and recall of information improve with the use of verbal and visual aids.<sup>10,12,18</sup> Therefore, demonstrating a few techniques from the brochure in addition to the dentist’s individualized verbal instructions will probably improve understanding and compliance with a proper oral hygiene regime. Moreover, this brochure could make patient–dentist communications much more efficient,<sup>12</sup> thus saving valuable chair time.

The attitude of the dentist toward the brochure is important for its success. According to several studies, some health professionals do not make maximum use of written information, even when it is supplied to them.<sup>10,12</sup> Approximately half of the patients in 1 study dealing with patient information for the care of the mouth after

radiotherapy did not receive the available information.<sup>7</sup> Some professionals may wish to modify their routine behaviour in this respect to make use of this oral hygiene tool.

Previous studies have shown that patients like to receive information leaflets, find them helpful and easy to understand and even pass them on to friends.<sup>10,12</sup> This is consistent with our results, as 96% said that they would keep the brochure as a reference. It has also been shown that the majority of patients keep leaflets for at least 12 months, and older patients and those with less initial knowledge are more likely to reread an information pamphlet.<sup>10</sup>

We found that more respondents learned new information about oral hygiene for their implants (75%) than about their dentures (58%) from this brochure. This is understandable, as all of the participants had been wearing dentures for more than 5 years, but had received implants within the past year. This suggests that the brochure may be more meaningful for the care of implants than for that of the overdenture prosthesis. However, some participants found that they still had new things to learn regarding oral hygiene for their overdentures — some reported that they did not know that they had to brush their dentures or their gums. The fact that many participants recalled specifically what new information they had learned suggests that they might have incorporated these techniques into their routine; however, we did not measure changes in our study group's oral hygiene behaviour. A study<sup>19</sup> on denture wearers who received verbal and written instructions found that there was no improvement in the participants' oral hygiene behaviour. Although the authors suggest that behaviour does not change with these approaches, the brochure used in that study was printed in black and white and had no photographs. In our study, the photos were so effective for one patient in particular, that he stated that as soon as he read the brochure, he checked in the mirror to see if there was still plaque on his implants.

Of our participants, 79% reported that their dentist spent enough time on oral hygiene instructions; however, many commented that they did not remember everything the dentist told them. This is slightly better than the results obtained in a previous study in which, although all patients had received written and verbal instructions multiple times during treatment, only 42% remembered that they had received instructions 4 months later, 51% stated that they had never received instructions and 7% did not remember either way.<sup>19</sup>

The low percentage of participants willing to change from a regular toothbrush to a rechargeable toothbrush is attributed to cost and habit. In 1 study,<sup>19</sup> even after patients were given a denture toothbrush by the dentist, regular toothbrushes were still used 4 times more

frequently than the denture toothbrush, suggesting that old habits are hard to change. Another possible reason for the unwillingness of 42% of respondents to buy a battery-powered toothbrush could be because they believe that their manual dexterity is adequate and that they are performing oral hygiene procedures with a manual toothbrush properly.

A high proportion of people in institutions have mild cognitive impairment and poor oral status. Thus, they carry a high risk of developing candidiasis, denture stomatitis and other oral diseases. There is a need for careful and close surveillance of the oral hygiene and oral health among those in long-term care. This brochure could guide nurses and other caregivers to improve the oral health of their patients.

We acknowledge limitations to this study. Patients were questioned by the author of the brochure and the responses were not anonymous. Thus, responses may have been biased. The patients may have wanted to please the investigator and, thus, may have answered more positively. Furthermore, although the participants may have learned something new about maintaining their implants and overdentures, we did not test behaviour change.

New knowledge does not necessarily translate into behaviour change.

Based on comments received from a JCDA reviewer, the brochure will be revised to include denture brushing in the step-by step summary, and brand names of the mouth rinses will be concealed. Future editions of the brochure will also mention that it is easier to see debris on the denture if it is dry and that brushing after soaking will remove debris that has been loosened during the soaking process.

## Conclusion

We have described the creation of and patients' responses to an oral hygiene brochure designed for patients wearing mandibular overdentures supported by 2 implants. This brochure can be very useful for patients who are elderly, forgetful and unsure of the instructions that the dentist provides. It serves as a tool that caregivers can read, as well as for dentists to use while educating their patients. In a survey of patients who received the brochure, most rated the material "very high" in usefulness and would keep it as a reference. Most of the participants reported that they learned something new about how to keep their dentures clean, but even more learned something new about how to maintain their implants properly. We conclude that this brochure is easy to read and understand and that edentulous patients find it useful. Further studies designed to test the brochure's effectiveness in improving oral hygiene for the population are needed. ✦

## THE AUTHORS

**Acknowledgements:** We thank Dr. J.M. Thomason, Dr. V. Benhamou, Dr. S. Kimoto, Ms. A. DePalma, Ms. Tina Hueftlein and Dr. S. Tran for their assistance in the development of the brochure. Dr. Mok was funded by a 2005 Canadian Institutes for Health Research Health Professional Student Research Award. The authors did not receive any benefit, financial or otherwise, by using, displaying or referring to certain brand names or products.



**Dr. Mok** is a resident in the Multidisciplinary Training Program at McGill University, Montreal, Quebec.



**Dr. Emami** is a prosthodontist and PhD candidate at the University of Montreal, Montreal, Quebec.



**Dr. Kobayashi** is a prosthodontist and associate professor at Nihon University School of Dentistry at Matsudo, Japan.



**Dr. Feine** is professor and director of graduate studies, faculty of dentistry, McGill University, Montreal, Quebec.

**Correspondence to:** Dr. Jocelyne Feine, McGill University, 3550 University Street, Montreal QC H3A 2A7.

The authors have no declared financial interests.

This article has been peer reviewed.

## References

1. Covani U, Marconcini S, Crespi R, Barone A. Bacterial plaque colonization around dental implant surfaces. *Implant Dent* 2006; 15(3):298–304.
2. Scannapieco FA. Pneumonia in nonambulatory patients: the role of oral bacteria and oral hygiene. *J Am Dent Assoc* 2006; 137 Suppl:21–55.
3. Sumi Y, Kagami H, Ohtsuka Y, Kakinoki Y, Haruguchi Y, Miyamoto H. High correlation between the bacterial species in denture plaque and pharyngeal microflora. *Gerodontology* 2003; 20(2):84–7.
4. Kulak-Ozkan Y, Kazazoglu E, Arikian A. Oral hygiene habits, denture cleanliness, presence of yeasts and stomatitis in elderly people. *J Oral Rehabil* 2002; 29(3):300–4.
5. Shulman JD, Rivera-Hidalgo F, Beach MM. Risk factors associated with denture stomatitis in the United States. *J Oral Pathol Med* 2005; 34(6):340–6.
6. Quillen DA. Common causes of vision loss in elderly patients. *Am Fam Physician* 1999; 60(1):99–108.

7. Zakrezewska RM, Leeson MA, Mcluskey M, Vickers M. The development of patient information leaflets. Care of the mouth after radiotherapy. *Gerodontology* 1997; 14(1):48–53.
8. Bickel H, Mosch E, Seigerschmidt E, Siemen M, Forstl H. Prevalence and persistence of mild cognitive impairment among elderly patients in general hospitals. *Dement Geriatr Cogn Disord* 2006; 21(4):242–50. Epub 2006 Feb 7.
9. Unverzagt FW, Gao S, Baiyewu O, Ogunniyi AO, Gureje O, Perkins A, and others. Prevalence of cognitive impairment: data from the Indianapolis Study of Health and Aging. *Neurology* 2001; 57(9):1655–62.
10. Boundouki G, Humphris G, Field A. Knowledge of oral cancer, distress and screening intentions: longer term effects of a patient information leaflet. *Patient Educ Couns* 2004; 53(1):71–7.
11. Feine JS, Carlsson GE, Awad MA, Chehade A, Head T, Lund JP, and others. The McGill consensus statement on overdentures, Montreal, Quebec, Canada, May 24–25, 2002. *Int J Prosthodont* 15(4):413–44.
12. Weinman J. Providing written information for patients: psychological considerations. *J R Soc Med* 1990; 83(5):303–05.
13. Mansoor L, Dowse R. Written medicines information for South African HIV/AIDS patients: does it enhance understanding of co-trimoxazole therapy? *Health Educ Res* 2007; 22(1):37–48. Epub 2006 Jun 8.
14. Segador J, Gil-Guillen VF, Orozco D, Quirce F, Carratala MC, Fernandez-Parker A, and other. The effect of written information on adherence to antibiotic treatment in acute sore throat. *Int J Antimicrob Agents* 2005; 26(1):56–61.
15. Blinder D, Rotenberg L, Peleg M, Taicher S. Patient compliance to instructions after oral surgical procedures. *Int J Oral Maxillofac Surg* 2001; 30(3):216–19.
16. Agrawal SK, Singh M, Mathew JL, Malhi P. Efficacy of an individualized written home-management plan in the control of moderate persistent asthma: a randomized, controlled trial. *Acta Paediatr* 2005; 94(12):1742–6.
17. Sockrider M, Abramson S, Brooks E, Caviness AC, Pilney S, Koerner C and other. Delivering tailored asthma family education in a pediatric emergency department setting: a pilot study. *Pediatrics* 2006; 117(4 Pt 2):S135–44.
18. Moseley TH, Wiggins MN, O'Sullivan P. Effects of presentation method on the understanding of informed consent. *Br J Ophthalmol* 2006; 90(8):990–3. Epub 2006 May 10.
19. Burnett CA, Calwell E, Clifford TJ. Effect of verbal and written education on denture wearing and cleansing habits. *Eur J Prosthodont Restor Dent* 1993; 2(2):79–83.

### Appendix 1

The patient brochure on oral hygiene is a PDF document. [Click here](#) for the English brochure “How to take care of your implants and overdentures” and [click here](#) for the French version “Comment prendre soin de vos implants et de vos prothèses”.

**Appendix 2** Telephone questionnaire

**Personal Information**

- 1) Are you currently employed?  
 Yes  No
- 2) What level of education have you completed?  
a)  elementary    b)  high school    c)  university    d)  post graduate
- 3) In which age category are you?  
a)  65–70    b)  71–75    c)  76–85    d)  86–90    e)  over 91
- 4) Do you live alone?  
 Yes  No
- 5) Before you read this brochure, how would you have rated the cleanliness of your  
*implants*    1 (not clean at all) -----10 (very clean)  
*denture*    1 (not clean at all) -----10 (very clean)
- 6) On a scale from 1–10, how important is it to you to keep your implants and dentures clean?  
1 (not important at all) -----10 (very important)

**Patient's habits/Marketing research**

- 1) How often do you brush your implants and dentures?  
*Implants*  
 Never     1x/week     1x/day     2x/day     more than 2x/day  
*Dentures*  
 Never     1x/week     1x/day     2x/day     more than 2x/day  
*Soaking dentures*  
 Never     1x/week     1x/day     2x/day
- 2) How much time are you willing to spend on cleaning your implants and dentures per day?  
 2 minutes     5 minutes     10 minutes     15 minutes     As long as it takes
- 3) Would you ever buy these products?  
Battery-powered toothbrush (\$20)     Yes     No  
Rechargeable powered toothbrush (\$70)     Yes     No  
Regular toothbrush (\$2)     Yes     No  
Superfloss (\$5)/cotton swab     Yes     No  
Mouthwash (\$4)     Yes     No  
Denture tablets (\$5)     Yes     No

**Effectiveness of the brochure**

- 1) After reading this brochure, did you learn something new about how to clean your *implants*?  
 Yes  No
- 2) After reading this brochure, did you learn something new about how to clean your *dentures*?  
 Yes  No
- 3) How would you rate the usefulness of this brochure from 1–10? (1 being not at all useful and 10 being very useful)  
1-----10

4) Are you capable of doing the 4 steps yourself?

Yes  No

5) A) If not, which step(s) do you find difficult?

Step 1. Brushing  Step 2. Flossing/Wiping  
 Step 3. Mouthwash  Step 4. Soaking dentures

B) Why?

Technically difficult  Time consuming  
 Understanding  Cost  Other \_\_\_\_\_

6) Which sentences/parts, if any, are not clear to you?

7) How did this brochure make you feel about cleaning your implants and dentures?

a) It informed me well   
b) It taught me some tips, but I didn't really need it   
c) Indifferent   
d) Confusing   
e) It has too much information

**A question to test recall**

1) A) According to the brochure, how often should you see the dentist?

a) Every 3 months      b) 6 months or more often      c) Every year  
Is patient response correct  Yes  No

B) Did you read the entire brochure?

Yes  No

2) Is the brochure clearer than the verbal instructions that the dentist gave you?

Yes  No

3) In your opinion, did your dentist spend enough time on oral hygiene instructions?

Yes  No

4) Is there enough information/detail provided in the brochure?

Enough  Need more information  Too much

5) Will you keep the brochure as a reference?

Yes  No

**Style and format**

1) Are the letters in the brochure easy to see and read?

Yes  No

2) Are there any words that you do not understand?

Yes  No

3) Do the pictures help you understand the words?

Yes  No

4) Is the brochure too long?

Yes  No

**Comments:**

---

---

---