

Denture Adhesives Usage in Removable Prosthodontics



By Jason Psillakis DDS, MS

Clinical prosthodontics has focused on approaches to improving retention and stability of dentures. In addition to proper fabrication, those approaches have included the use of denture adhesives, retention of a limited number of teeth for overdentures and placement of implants, with the fixtures serving to anchor the prosthesis. In addition, many denture wearers utilize denture adhesives as an over-the-counter approach to improve retention and stability, but the use of these products is not wholly endorsed by the dental profession.^{1,2}

Traditionally, dental education concerning denture prosthesis fabrication has emphasized proper diagnosis and patient evaluation, which includes the examination and impression, an understanding of the masticatory apparatus and occlusion, and then proper laboratory fabrication of complete and partial removable prostheses. Adisman notes that instruction in denture aftercare is generally neglect-

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ed when compared to the attention given to the steps in treatment that precede delivery of the denture to the patient. It is important that partially edentulous and completely edentulous patients be given instructions concerning the proper use of dentures, including if and when to use denture adhesives.

Dentists who provide prosthodontic services on a regular basis tend to disregard the advantages of using denture adhesives. Often implied here is the perception that the use of adhesives stems from inadequate denture retention, which in turn implies a denture that is not properly fabricated. The clinician may feel that denture adhesive use by a patient is

Table 1. Correct Application of Denture Adhesives (adapted from Adisman¹).

The application of denture adhesive to a denture:

- (1) The tissue-bearing surface is thoroughly cleansed.
 - a. All adhesive is removed (use of wipes, cotton applicators and orange solvent).
 - b. Care taken so the tissue surface is not scratched.
- (2) The mucosal surface is cleared of food debris, previous adhesive and saliva.
- (3) The adhesive is applied to the undersurface of the denture. Limited amounts are used.
 - a. The denture should be wet before a powder is applied.
 - b. For maxillary dentures, apply adhesive to the anterior alveolus, superior aspect of the palate and posterior seal areas of the appliance.
 - c. For mandibular dentures, the adhesive is applied to the depth of the tissue-bearing surface from the anterior to posterior regions.
- (4) The denture is seated and held firmly in place by hand pressure for 10 seconds.
 - a. Adhesive that is expressed from the denture is removed by using wipes.
 - b. The jaws are closed together several times (in centric occlusion) to evenly distribute the adhesive below the denture in a thin layer.

a commentary on his or her clinical skill. In a related sense, a knowledgeable patient who uses a denture adhesive may conclude that their denture was not ideally fabricated.

In contrast to this negative attitude concerning the use of denture adhesives, evidence is now accumulating that these products can be beneficial as part of denture care. With appropriate information and instruction, denture adhesives can, for some patients, improve denture retention and stability without detrimental effects on the mucosa.³⁻¹¹

As reviewed by Adisman, the use of denture adhesives can be traced back to the end of the 18th century, which coincides with the introduction of modern dental procedures. During the 1800s these products were mixed by apothecaries who used different vegetable and plant gums to yield a mixture that, upon contact with saliva would swell into a mucinous gel that adhered both to the denture and the mucosa. The first patent for a den-

ture adhesive was awarded in 1913, and the ADA referenced adhesives in the 1935 edition of Accepted Dental Remedies.¹²

Today, denture adhesives are formulated as creams, pastes and powders. Primary constituents include components that promote adhesiveness (ie, karaya gum), antifibrotic compounds (ie, hexachlorophene), and other agents that improve product characteristics (ie, plasticizers).¹³ Characteristically, an adhesive should first demonstrate low viscosity, which will allow manipulation and placement. This should be followed by high viscosity, a characteristic that would promote retention.¹⁴ An adhesive that always maintains a low viscosity would be poorly retentive; an adhesive that is too viscous would lead to problems with oral hygiene and denture cleanliness.

USE OF DENTURE ADHESIVES IN MODERN PROSTHODONTIC CARE

It is recognized that denture retention in the

mouth is the result of the complex interplay of different forces related to local anatomy, patient dependent variables, how the prosthesis is fabricated, and different aspects of surface properties.^{15,16} Adhesives can improve the retention of the denture to the mucosal surface. This is mediated in part by a thin layer of saliva.

The advantages of increased denture retention and stability observed with denture adhesive use has been confirmed in studies with patients who are new to dentures, as well as patients who have previously worn dentures.^{4,17-21} The increased retention and stability results in an increase in the force that can be applied during chewing, which translates into fewer strokes to allow swallowing to occur. Other advantages of adhesives include a better distribution of forces on the appliance (which will decrease the formation of ulcers on the mucosal surface), prevention of food debris from accumulating under the denture, and prevention of overgrowth of fungal organisms (*Candida albicans*).^{21,5,6,22} Adhesives are recognized as protective of the mucosa, and also aid in proprioception.^{5,7,8}

Furthermore, if used properly, denture adhesives will not increase bone resorption, contribute to adverse changes in the vertical dimensions, or cause any alteration in the activity of muscles of mastication.^{5,6} Consequently, adhesives deserve to be re-examined as an adjunct to clinical denture care.^{7,9,23}

Characteristics of the ideal adhesive would be a cream that is not irritating and completely biocompatible, without an odor or taste. A cream is preferred to a powder because creams will have a reduced tendency to be washed away in oral fluids.⁷ Application should be easy, and flow should be minimal so the adhesive remains as placed. The product should also be easily removed from both the denture undersurface and the mucosa. The adhesive properties should remain for 12 to 18 hours. As for patient perception, the ideal adhesive would provide improved retention and stability, leading to improved function dur-

ing speech, when chewing, and during routine activities (ie, smiling).

Denture adhesives can prove useful during different stages of denture fabri-

cation. These products can also be used during recordings with denture bases. They can also be utilized during the try-in of teeth, as well as during insertion of

immediate dentures. Adhesives can be used to provide new denture patients who are concerned with retention with a greater sense of personal security.

CONTRAINDICATIONS FOR THE USE OF DENTURE ADHESIVES

There are a number of rea-

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sons why denture adhesives should not be used. An allergy to the adhesive (or compo-

nent of the adhesive) is an obvious contraindication.²⁴ This allergy may not be recognized until the first time the adhesive is applied under the denture. Inadequate den-

tures (ie, as a result of mandibular or maxillary atrophy) should not continue to be used by employing an adhesive. If there is extreme loss of vertical dimension

and the soft tissue is poorly formed, new dentures are indicated. In this case, pre-prosthetic surgery may be needed, and those patients should be evaluated for other

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approaches to improve retention (ie, osseointegrated implants). Occasionally patients will use excessive amounts of adhesive, which leads to a build-up of hard adhesive on the underside of the denture. Patients should be instructed in the proper use of adhesives. If this does not correct the problem, or the patient cannot clean the adhesive, then use of these products should be discouraged. A damaged or broken denture (ie, flange fracture) should not be retained by using an adhesive. Repair or construction of a new denture is indicated.

The amount of adhesive applied is specific to the individual patient. This is determined by the space between the denture and the mucosa. During application, the amount extruded from the denture borders should be minimal, but some adhesive should be observed.⁸ The ideal thickness of the layer has been suggested to be 1 mm.²⁵ Information provided by manufacturers can be useful, but patients often learn over time the appropriate amount of adhesive to be used.

CONCLUSIONS

For patients who require removable dentures, dentists seek to provide ideal restorations that are retentive and stable, hygienic and aesthetic. Under these conditions, patients should not require denture adhesives as part of denture aftercare.

Nevertheless, as the population ages and patients live longer, and advances in medical care result in more dental patients with multi-system diseases, the profession is likely to treat individuals

with extensive ridge resorption who are unable to be seen on a regular basis. This demographic shift suggests the need for re-evaluation of denture adhesives as part of denture care. In fact, new research aimed at development of ideal products is warranted.

A survey of the oral health status of seniors in the United States (65 years and older), based on a study conducted in 1985 to 1986 indicated that only 13% of edentulous seniors had visited the dentist in the past 12 months.²⁶ This percentage, while likely improved since the mid to late 1980s, is quite low, and all individuals should be urged to see the dentist on a regular basis.

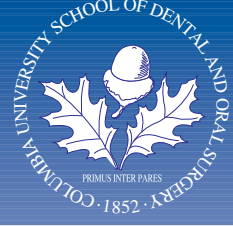
Regular oral/dental care for patients with dentures is recommended, both for evaluation of the prostheses, teeth (if present), and mucosal tissues.^{1,27,28} When needed, denture adhesives can be suggested, but proper instruction on denture aftercare is essential. With this approach, the most appropriate care can be provided.^F

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Continuing Education Test No. 39.2



To submit Continuing Education answers, use the answer sheet on page 153. On the answer sheet, identify the article (this one is Test 39.2), place an X in the box corresponding to the answer you believe is correct, detach the answer sheet from the magazine, and mail to *Dentistry Today* Department of Continuing Education.

The following eight questions were derived from the article *Denture Adhesives Usage in Removable Prosthodontics* by Jason Psillakis DDS, MS, on pages 90 through 93.

Learning Objectives

After reading this article, the individual will learn:

- the proper use of denture adhesives in denture aftercare.
- contraindications to the use of denture adhesives.

1. Improving retention and stability of dentures has been accomplished by all of the following except:

- use of implants.
- overdentures.
- denture adhesives.
- flange extension.

2. Adisman¹ had mentioned that instruction in denture aftercare is generally _____ when compared to the attention given to treatment planning and construction of the denture.

- accepted
- neglected
- disregarded
- comparable

3. According to Adisman¹, the introduction of denture adhesives can be traced to the :

- 17th century.
- 18th century.
- 19th century.
- 20th century.

4. Adhesives should initially demonstrate a _____ viscosity, allowing for manipulation and placement, and then followed by a _____ viscosity, to promote retention.

- low, low
- high, low
- low, high
- high, high

5. Denture adhesives, if used properly, have all of the following advantages except:

- prevention of the overgrowth of fungal organisms.
- protective of the mucosa.
- lessen the forces on the prosthesis.
- prevention of food debris from accumulating under the denture.

6. Contraindications for denture adhesive usage include all of the following except:

- damaged/broken denture flanges.
- allergy to the product or the component of the product.
- deficient dentures resulting from maxillary/mandibular atrophy.
- the presence of diabetes mellitus.

7. When applying denture adhesive correctly, the complete denture is seated and held firmly in place for _____ seconds.

- 10 seconds
- 20 seconds
- 30 seconds
- 1 minute

8. The ideal thickness of a denture adhesive layer on the undersurface of a complete denture is:

- 0.5 mm.
- 1.0 mm.
- 1.5 mm.
- 2.0 mm.