

# Gag Reflex: Causes and Management

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## ABSTRACT

The gag reflex is a complex physiologic phenomenon that compromises quality of dental treatment and is a barrier to optimal patient care. This phenomenon is protective in nature. This reflex presents a bewildering and frustrating problem in various dental procedures, resulting in compromised treatment. The technique or techniques used should be dictated by the cause or causes involved. If organic disturbances, anatomic anomalies, or bio mechanical inadequacies of the existing prosthesis are not key causes the services of trained specialists are needed to help with behavioral management of the problem. A review of management of such kind of patients follows and includes strategies to assist clinicians.

**KEYWORDS:** Gag, Reflex, Management

## INTRODUCTION

Gag reflex is an annoying situation that appears mainly during prosthodontic procedures. It is an inborn mechanism to protect upper respiratory tract from foreign body obstruction. However, it can also be an acquired reflex, conditioned by various stimuli: visual, olfactory, acoustic, psychic, chemical or toxic transmitted via the blood flow or the cerebrospinal liquid.<sup>1-3</sup> Patients complain of unpleasant feeling, nausea, gagging or vomiting during the dental procedures which creates a difficult situation to manage.

The normal gag reflex is an adaptive vital mechanism for survival controlled by primary parasympathetic division of the autonomic nervous system. Gagging movement alter the shape of pharynx and eject foreign bodies from mouth and pharynx and prevents foreign bodies from entering the trachea.

## FACTORS AFFECTING GAGGING

### *Local and systemic disorders:*

- Nasal obstruction, postnasal drip, Sinusitis, nasal polyps, congestion of the oral, nasal and pharyngeal mucosa, chronic diseases of gastrointestinal tract, parasympathetic impulses from severe pain in sites other than the gastrointestinal tract may also causes gagging, chronic gastritis, carcinoma of stomach, partial gastrectomy peptic ulceration, cholecystitis, carcinoma of the pancreas diaphragmatic hernia, and uncontrolled diabetes are also considered as causes of gag reflex.
- Dentures stimulate gagging of moving against the soft tissue or by reducing the tongue spaces and causing the tongue to be displaced posteriorly into pharynx.

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**Anatomical factors**

Physical factors such as anatomic abnormalities and oro-pharyngeal sensitivities have been suggested as predisposing factors to gagging.<sup>3,4</sup> In a study of denture wearers that compared the radiologic anatomy of gaggers and non-gaggers, no anatomic abnormalities were observed.<sup>5</sup> Enlarged areas of sensory innervation cannot, however, explain why patients gag with auditory, olfactory, or visual stimuli.<sup>6</sup>

**Social factors of gagging include:**

Heavy smoking causes gagging can be the result of hypersensitivity, chronic catarrh, Coughing and excessive consumption of alcohol. Gagging can also result from a restricted airway. It is difficult for a patient with a very larger tongue or a small nasopharynx to tolerate bulky dentures.

**Classical conditioning**

Classical conditioning occurs when an originally neutral stimulus is paired with a specific behavioral response. Inoffensive stimuli, such as the sight of an impression tray, the smell of the dental surgery, or the sound of a dental handpiece, may become associated with an unpleasant gag response. The patient learns to broadly associate the stimuli as the cause of the gagging, and hence a conditioned gag.<sup>7</sup>

**Operant conditioning**

Operant conditioning is a training process whereby the consequence of a response changes the likelihood that the individual will produce that response again. In operant conditioning, some behavior patterns may be reinforced because they secure attention and sympathy.<sup>8</sup>

**Iatrogenic factors**

Poor clinical technique may elicit the gag reflex in patients not normally susceptible to gagging. For example, an overloaded impression tray or an unstable or poorly retained prosthesis may

induce gagging. Overextended borders of a prosthesis can impinge on the “trigger zones” and produce gagging. An increased vertical dimension of occlusion, smooth, highly polished surface which is coated with saliva may produce a “slimy” sensation which is sufficient to cause gagging in some patients.

**MANAGEMENT**

A patient with a severe gagging problem may initially require referral to a clinician. Often, the patient’s dentist is in an excellent position to reinforce and apply the management techniques to which the patient has been exposed.

**Assessment**

It is important that the clinician obtains a detailed history in an unhurried, calm and reassuring environment. The attitude of the clinician towards the patient may influence the outcome of treatment. The patient should be informed of what the intraoral examination involves, and the inspection should only proceed when consent has been given. The role of the dental team is to be sympathetic to the patient’s difficulties, to begin to establish a dialogue, and to generate trust, which can be time consuming.<sup>9-11</sup>

**Interventions**

The aim of treatment is to allow the patient to receive dental care, such as restorative treatment or the wearing of dental prostheses with a minimum of anxiety and stress. Several authors have suggested *behavioral techniques* like hypnosis relaxation, relaxation plus controlled breathing and positive self-statements and performances of incompatible responses such as reading all have been used with some success.<sup>12</sup> Distraction techniques can be useful to temporarily divert patient’s attention and may allow a short dental procedure. Conversation can be useful, or the patient may be instructed to concentrate on

breathing, for example, inhaling through the nose and exhaling through the mouth.

### **Pharmacological techniques**

Medications such as sedative antihistamine, parasympathetic and topical anesthetics have been used with some success. In some cases analgesics has also been used.<sup>13</sup>

### **Psychological techniques**

Psychotherapy has been recommended for chronic or hysterical gagging. Other methods like acupuncture has also been tried for managing gag reflex.<sup>14</sup>

### **Appleby and Days finger massage technique and Singer's Marble technique.**

Appleby and Bay's finger massage of the soft palate and Singer's 'marble technique', seem to be methods by which the gag reflex can be exhausted thereby allowing for graduated exposure to the dental prosthesis or procedure. Lee-Singer used a technique that required patients to keep up to five marbles in their mouth, as often as possible, in the week prior to the commencement of prosthodontic treatment. He then constructed acrylic training baseplates without teeth. These baseplates are worn and up to three marbles used concurrently. The dentures are constructed and given to the patient with a small acrylic bead attached to the lingual polished surface.<sup>10, 15</sup>

### **Reduction of palatal coverage of maxillary denture<sup>16</sup>**

The maxillary denture can be reduced to a U-shaped border situated approximately 10 mm from the dental arch. It also improves sense of taste positively, and gagging tendency disappears. Some modification in the dental procedures can be done to prevent gagging like *modification of custom tray while making impressions.*<sup>16-19</sup>

The maxillary custom tray can be modified to prevent gagging as follows:

- Severe maxillary cast from a preliminary impression in the usual manner.
- Block out all undercuts on the cast and form a tray with autopolymerizing acrylic resin that is 2-3 mm short of all vestibular extensions. No handle should be placed at this time.
- Place base plate wax on the superior surface of the tray at the posterior segment. The wax should have roughly the same outline as the posterior palatal seal, extending from one tuberosity to the other.
- Attach a disposable saliva ejector to the base plate wax in the midline of the tray. Make sure the tip of the saliva ejector is embedded in the wax.
- Cover the wax with a thin layer of petroleum jelly.
- Mix a second batch of autopolymerizing tray acrylic resin. Form this material into a thin sheet and place it over the wax and tip of the saliva ejector.
- The material should extend past the wax and attach to the original tray.
- After the acrylic resin has cured, remove the wax spacer.
- Smooth any roughness on the tray and polish the tray at this time.
- Add a wax occlusion rim to the tray to approximate the position and contour of the teeth in the completed denture.
- Trim the posterior extent of the tray and border mold in the usual manner.
- Mix the impression material and load the tray. As the impression tray is being seated in the mouth, the assistant attaches the low volume evacuation base to the end of the saliva ejector embedded in the tray.

- Border mold the impression in the usual manner.
- Remove the tray from the mouth after the impression material extruding from the posterior border of the tray has been sucked into the vacuum chamber that was formed.

### Conditioning prosthesis

A conditioning denture consists of alveolar palatal prosthesis can be used in problem patients which is used to train the patient to gradually control gagging and adapt to reduced taste sensations. Hoad-Reddick and Murphy used breathing control as a way of relaxation for patients with gagging problems. Hoad-Reddick used a method of 'controlled rhythmic breathing, developed by the National Childbirth Trust for women in labour, to overcome gagging problems. The technique is similar to relaxation breathing exercises taught within schools of martial arts, yoga and meditation.

## CONCLUSION

Gagging can be a great distress to the patient and clinician also. We usually come across patients who are extremely sensitive and cannot tolerate any foreign substance. A wide variety of techniques is available and should be tailored to suit the particular patient. This is possible with the detailed history of patient so that the needs can be accomplished. Usually combinations of techniques are used to prevent gagging. But unfortunately minorities of patients are there in whom gag reflex cannot be managed. So a proper history an implication of combined technique may help in this overt situation called gag reflex.

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