

## FREQUENTLY ASKED QUESTIONS

Here you will find the most common questions and concerns presented by patients over the years. Dr. Massad believes this to be a useful reference for both his patients and fellow practitioners.

### REPLACING OLD DENTURES

#### Do I need a denture replacement?

Although there are no absolutes with regard to when a complete denture should be replaced, healthy conditions dictate that denture should typically be replaced ever four to eight years. The need to replace a complete denture usually is associated with deterioration of the materials used to construct the dentures, or irreversible changes in the contour of the patient's jaws adversely affecting the fit of the dentures.

#### What considerations influence the decision to remake a denture ?

Each patient's denture needs are different. There are several factors that a qualified dentist must take into account when evaluating a denture for replacement:

**Vertical dimension:** The linear distance between the upper jaw and the lower jaw is called "vertical dimension". Frequently, The dentists physically measures this distance on a patient in a relaxed, upright posture from a dot placed on the tip patient's nose to a dot placed on the patient's chin. The vertical dimension is unique to ever individual and must be carefully check to assess its appropriateness.

In the years following loss of the natural teeth, the jawbone both changes shape and decrease in overall size. As this occurs, the once accurately fitting complete dentures become loose and unstable. Additionally, the patient may have "lost vertical dimension" which, in laymen's terms, means that the patient's nose and chin may have gotten closer together. Many patients have worn the same complete dentures for extended periods of time and have suffered considerable loss of vertical dimension. Since this loss of vertical dimension is a slow, but progressive phenomenon, the patients may have gradually adapted to their changing condition. Outward signs of the loss of vertical dimension include a shrunken, hollow facial appearance, particularly around the mouth. It is also possible that the temporomandibular joints may be adversely affected and that the patient's ability to function may become compromised.

As a corrective measure, additional pink denture plastic may be added to the inside of a loose denture (called relining a denture) in order to achieve reasonable stability. Unfortunately, relining does not predictably and accurately restore the patient's optimal vertical dimension. Dentists will usually consider it necessary to construct a new complete denture when the vertical dimension has been reduced by 3 millimeters.

**Tooth wear:** Aside from impaired ability to chew effectively, excess wear of the denture teeth will adversely affect esthetics and contribute to problems associated with lost vertical dimension.

**Deterioration of denture materials:** While the materials used to fabricate modern dentures are

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quite durable, the inevitable deterioration, wear, and dimensional changes that occur over time will eventually render the dentures insufficient and in need of replacement. Aging pink denture plastic loses its natural appearance, texture and coloration, making the dentures appear quite artificial. Deteriorating denture plastics may also become excessively contaminated with microorganisms. This may in turn contribute to mouth irritations, bad taste and socially unacceptable odors.

Keeping regular dental check ups with qualified practitioners is necessary to maintain optimal health of the oral soft tissues and jawbone and is essential to extending the life and function of a complete denture.

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## FIRST TIME WEARING DENTURES

### How can I possibly live with dentures?

Without question, conventional complete dentures are a less than perfect replacement for natural teeth. However, over time, complete dentures have been proven to be an effective means of restoring the patient's ability to comfortably smile, chew, swallow and speak. For patients with reasonable expectations, acclimation to new complete dentures can be achieved in a relatively short period of time. One must practice with their new dentures and learn the limitations and compensations need to achieve successful adaptation. The old adage of "learn to walk before you run" certainly applies here!

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### What are some factors to consider when wearing a new denture?

Some of the common areas of concern for many new complete denture wearers are listed below.

**Full feeling:** When new dentures are first placed in the mouth, the patient may perceive a feeling of fullness, or a lack of adequate space for the tongue. This is particularly true for patients that have been without natural teeth or prosthetic replacements for extended periods of time. Following a short period of acclimation, the bulky feeling of the new denture will subside. A full sensation may also be apparent to the facial tissues, lips and cheeks. The loss of facial tissue support following loss of the natural teeth can typically be regained with the new denture. The facial tissues adapt rapidly to their new support system as the patient soon realizes improved comfort and esthetics.

**Speech difficulty:** The sounds we produce during normal conversation are greatly influenced by the position and contours of the oral structures, including teeth. When a new denture is placed, the patient must accommodate to subtle alterations in tooth position and denture base shape relative to their previous oral condition. Minor changes in speech sounds, usually more noticeable to the patient than the general public, are temporary in duration. During the short period of accommodation, the patient should make an effort to speak slowly and clearly, pronouncing words very precisely. The tongue and facial muscles will quickly adapt. It may be useful to read a book or newspaper out loud, carefully pronouncing each word.

**Sore spots and irritations:** Localized and frequently painful sore spots may develop following placement of a new complete denture. This requires that careful adjustment be made to the dentures. These adjustments may involve subtle grinding on the pink denture plastic in the area of the sore spot, or precise adjustment of the contacts between opposing denture teeth. When sore spots occur, it is important that the patient inform the dentists as soon as possible to have the

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appropriate correction made. Taking dentures out of the mouth until adjustment can be made may improve the patient's comfort and will limit the extent of the irritation.

**Chewing patterns:** Just as the patient must re-learn the production of sounds during speech, acclimation to the precise jaw movements required for the effective chewing of food must occur. This may take several weeks. The re-learning process should begin with small pieces of soft food, gradually increasing the food's firmness over several weeks. As a general rule, improved denture stability during chewing can be achieved if the food is chewed on both sides of the mouth at the same time using only the back teeth. Use of the front teeth to incise through food typically causes the dentures to loosen and come away from the gums. Front teeth are considered primarily for esthetics and speech and to a lesser degree for function. Food should not be "bitten off" with the front teeth. Rather, the bolus of food should be held by the dentures, near the corners of the mouth, and torn off by rotating the hand holding food in a downward motion. This will increase chewing efficiency and reduce denture dislodgment.

**Psychological well being:** A denture patient needs to take control of their situation and keep a positive attitude for optimal results. Working closely with the dentists is very important and essential to the successful adaptation to new complete dentures!

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## IMMEDIATE DENTURES

### What are immediate dentures?

Immediate dentures are placed in the mouth "immediately" following extraction of the remaining teeth... the same day! This approach is used when the patient prefers to leave the dental office with prosthetic replacement for the missing teeth rather than waiting for several months while the extraction sockets heal and a conventional denture is fabricated.

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### What are the procedures involved in immediate denture therapy?

The most optimal approach to immediate denture therapy involves the construction of two separate dentures. The first denture is actually called the immediate denture. This denture will serve as a temporary or interim denture until adequate healing from the tooth extraction has occurred. Following appropriate healing a refined and esthetically enhanced definitive denture can be constructed.

Characteristics of the first (immediate) denture include:

- Prior to extraction of the front teeth, the back teeth are removed and the extraction site allowed to heal for at least six weeks.
- Following after adequate healing, an impression is made and the first denture, or the immediate denture, is fabricated.
- The remaining front teeth are extracted and the immediate denture is placed in the mouth. Wearing the denture immediately following removal of the front teeth is normally no more uncomfortable than going without the denture. Any discomfort is effectively managed with appropriate pain medication. The immediate denture actually functions as a Band Aid™ holding tissues together, support clot formation and protecting the extraction sites from debris

contamination.

- Typically, the immediate denture is not removed until the day following tooth extraction, at which time the surgical area is checked and all necessary denture adjustment accomplished.
- As healing progresses over the next several weeks, the immediate denture will loosen due to changes in the contour of the gums and jawbone. Temporary denture soft liners may be placed in the denture to help maintain reasonable fit during the course of healing. It may be necessary to reline the denture several times during the healing period. Denture adhesives may also be used to assist in denture retention and stability

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#### **What are some of the characteristics of the second (definitive) denture?**

- Following adequate healing, the definitive denture is constructed. Prior to construction of the definitive denture an accurate impression of reasonably healed tissues is made. Next, the denture is able to artistically position the denture teeth without interference of the patient's natural teeth, as was to case during construction of the immediate denture.
- Approximately six months following placement of the definitive denture, it may be necessary to completed a denture reline procedure to accurately adapt the denture to the gums following additional recontouring and healing of the jawbone.
- The patient should then be evaluated periodically for the need to accomplish additional adjustments or relines. The frequency of relines over the life of the denture is an individual matter unique to each patient and is best determined by a licensed dentist during biannual follow-up examinations.

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#### **Are there any other approaches for immediate denture therapy?**

- Although not advisable, it is possible to extract all of the teeth, back teeth and front teeth, at one time and insert the immediate denture on the same day. Such an approach is problematic and should be routinely discouraged unless the patient has no other alternatives.
- A third alternative is to extract all of the teeth at one time and to not place an immediate denture while the extraction sites heal. Because the need for an immediate denture is eliminated with this treatment, this is generally a more economical approach. However, the patient must be without teeth for several months.

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#### **What are the advantages of immediate dentures?**

- A patient is never force to be without their front teeth.
- The immediate denture serves as a "bandage", protecting the tooth extraction site while heal occurs following tooth removal.

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#### **What are the disadvantages of immediate dentures?**

- A second, definitive denture must be made following adequate healing of the extraction sites. This will increase the overall cost to the patient.

## USE OF DENTURE ADHESIVES

### Why do I need denture adhesives?

Some patients report that their denture has adequate retention without the use of adhesives. The need to use denture adhesive is determined by the amount of retention between the denture and underlying tissue. Even on properly constructed and good fitting dentures, the correct use of denture adhesives will further enhance retention between the denture and underlying gum tissues.

### Why may a denture lack good retention?

Regardless of procedures used during the denture fabrication process, there is always a slight space between the pink denture plastic and the patients' gums. This space is present due to fabrication limitations associated with making new dentures and due to the constantly changing contours of the jawbone over time. Typically, a slight space between the denture plastic and the gums is filled with saliva resulting in an adequately retained denture. However, as this gap increases the denture becomes less retentive and stable.

While this space exists in all dentures and increases with time, optimum denture function and retention may be improved by minimizing this space. Denture adhesives may be used to fill this space and improve denture retention. Additionally, the sticky quality of the denture adhesive provides additional means of denture retention. Both of these factors help to reduce the collection of food debris between the denture and the gums.

### How should denture adhesives be used?

Although some patients may prefer powder adhesives, thin paste adhesives may be superior since their viscous consistency is easier to manage and apply. Which ever works best for a particular patient should be used. Pea sized portions of the paste should be placed in jaw ridge and palate portions of the upper denture. A thin film of adhesive will spread across the denture surface as the denture is placed in the mouth. Use the least amount of adhesive needed to do the job is recommended.

When the patient notices that excess amounts of adhesive are required to achieve acceptable retention, an examination by a qualified dentist should be sought and appropriate denture maintenance should be provided.

The patient may need to experiment with how often to apply adhesives. Some apply it before each meal while others function satisfactorily all day with only one application.

### How should the adhesive be cleaned from the denture?

It can be difficult to remove the adhesive from the denture. The denture is best cleaned with a denture brush, soap and running water, or with a weak solution of white distilled vinegar in water. All adhesives should be removed from the mouth on a daily basis. Vigorous rinsing with warm water or salt water helps in the removal. It may be necessary to use a soft-bristled toothbrush, or a wash cloth to assist removal from the oral tissues.

### **What are the advantages of adhesives?**

- Effectively fills the gap between a denture plastic and the underlying gums to improve denture retention.
- Provides a sense of security, even with well fitting dentures, when additional confidence is desired.
- Facilitates acceptance of new dentures and builds the patient's confidence.
- Mat reduces food collection between the denture and the gums by sealing the denture borders.
- May assist the patient in opening their mouth wider for more confident biting and chewing.
- Decreases the irritation due to denture movement across the gums during habits such as grinding teeth together.
- May facilitate denture wearing for individuals with persistent dry mouth.

### **What are the disadvantages of adhesives?**

- Extend the required cleaning time for both the denture and the mouth.
- The patient may develop a false sense of security with a denture that require professional maintenance and adjustment, or with a denture that should otherwise be replaced.

## **SOFT DENTURE LINERS**

### **What are soft denture liners?**

A soft liner may be processed to the tissue surface of the denture; that is the surface of the denture that contacts the gums. This material may provide comfort for those patients experiencing considerable pain while wearing a denture made entirely from hard plastic. Patients experiencing pain while chewing swallowing and speaking with hard plastic dentures may have a low threshold for pain. Additionally, their gum tissues may be usually thin and poorly resistant to normal denture forces. When thin gum tissue is compressed between the hard jaw bone and hard denture plastic, pain can result. Replacing the hard denture surface with a soft denture liner may eliminate, or reduce, this painful tissue compression.

### **What are some of the characteristics of soft denture liners?**

Denture liners are typically special medical grade rubber or silicone compounds. In order for the soft liner to function properly, it must be reasonably thick. Therefore, prior to placing a soft liner into a normal hard plastic denture, a specified amount of the pink plastic must be removed from tissue surface of the denture to corresponding to the intended thickness of the soft liner. In removing the specified amount of pink denture plastic prior to placing the soft liner, it is possible that the denture will be structurally weakened. If this occurs it may be necessary to incorporate a

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metal reinforcing framework within the remaining pink denture plastic.

Following extended periods of normal use, soft denture liners tend to lose their original resiliency and become hard. Frequently, this hardening process is so gradual that patients are not aware of its occurrence. However, hardening of the soft denture liner will eventually lead to problems necessitating evaluation by a qualified dentist.

Soft denture liners are microscopically porous in nature. This porosity contributes to both deterioration of the material and accumulation of microorganisms. When the soft denture liner becomes contaminated with potentially disease causing microorganisms, such as fungi, it may be impossible to decontaminate the soft liner without having to replace it.

Patients suffering from dry mouth may find it troublesome to wear a typical hard plastic denture. Problems encountered range from pain/irritation secondary to denture rubbing in the absence of adequate saliva lubrication to loss of denture retention due to insufficient saliva between the gums and the denture. While soft denture liners may help these patients, the liners are generally much more difficult to maintain than regular hard denture plastics. Without sufficient quantities of saliva to limit microorganism accumulation, excessive contamination of porous soft denture liner is a problem, particularly when meticulous denture hygiene is not maintained.

**What are the advantages of soft denture liners ?**

- A soft denture surface for patients with sensitive gum tissues.
- The soft denture liner will accurately conform to the constantly changing contours of the jawbone surface. While this may help prevent pain from dentures that have moderately poor tooth contacts, it is not a long-term substitute for regular professional adjustments needed to maintain optimal contact between the denture teeth.

**What are the disadvantages of soft tissue liners ?**

- Soft denture liners continually deteriorate, harden, and collect microorganisms. They must be replaced on a regular basis, often on an annual basis or more frequently.
- Because soft denture liners may reduce the pain associated with other denture problems, patients may neglect necessary denture repairs and adjustments. Routine dental check-ups are absolutely mandatory, and particularly necessary with soft denture liners.
- Soft denture liners, and the procedures needed to process them into the denture, are generally more expensive than conventional hard denture liners.

**PORCELAIN VERSUS PLASTIC DENTURE TEETH**

**What should I know about porcelain and plastic denture teeth?**

In the past, porcelain denture teeth were generally preferred over plastic teeth due to greater durability and improved esthetics. In recent years however, with advances in polymer science, extremely wear resistant plastic denture teeth have overwhelmed the market place. Today, good

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quality plastic teeth are esthetically indistinguishable from porcelain teeth and the vast majority of dentures are fabricated using plastic teeth. For all practical purposes, the cost of porcelain and plastic teeth remains quite similar.

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**What factors may favor one type of tooth over the other?**

**Balanced bite and force transmission:** Contact between the upper and lower denture teeth is formally called denture occlusion. Changes in denture occlusion over time may reflect changes in the jawbone, or alveolar bone, upon which a denture rests. Additionally, changes in denture occlusion may reflect an uneven or exaggerated wear of the denture teeth themselves. Because changes in the supporting alveolar bone and, to a lesser extent, denture teeth are inevitable, frequent modification of the denture is necessary to maintain the proper denture occlusion. Although many theories exist regarding the most appropriate denture occlusion, most suggest that uniform and even contact, or balanced bite or balanced occlusion, is desirable.

Clinical experience may suggest that the increased wear resistance of porcelain denture teeth permit greater stability and maintenance of the denture occlusion. Caution should be exercised when considering this line of thinking since there is no valid, scientifically credible evidence to support this rationale. Some practitioners also believe that porcelain denture teeth tend to transmit the impact of biting forces to the alveolar ridge with greater intensity than that transmitted by plastic teeth. Again, caution should be exercised with regard to this line of thinking since a consensus of scientific evidence is lacking. Some practitioners are of the opinion that this greater force, especially when uneven as in an unbalanced occlusion, may be damaging to the alveolar ridges and could result in accelerated bone loss. Therefore, unless denture occlusion is checked and balanced on a regular basis, plastic teeth would probably be a preferred choice than porcelain teeth.

**Noise:** If porcelain denture teeth are vigorously brought into contact or habitually tapped together, a "clacking" sound can be heard. Plastic teeth may muffle this sound during normal function or habit jaw motions.

**Tooth strength:** Because porcelain teeth are extremely hard, when compared to plastic teeth, they tend to chip and crack easier. When cleaning dentures having porcelain teeth, they should be handled over a sink filled with water or over a towel. Should the denture accidentally fall, the water or towel will cushion the fall and hopefully reduce the risk of tooth breakage.

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**Which type of denture tooth is best?**

- If a patient has successfully worn dentures with porcelain teeth then the new dentures may be constructed using porcelain teeth. However with recent scientific advances in denture tooth plastics, switching to plastic teeth should be considered a reasonable alternative.
  - Regardless of the denture tooth material, successful denture function is strongly influenced by regular profession follow-up examinations to evaluate and maintain optimal balanced occlusion and appropriate fit of the dentures.
  - If a denture is going to be worn against natural teeth in the opposing jaw than plastic teeth should be used. If porcelain denture teeth are used, their extreme hardness will cause excessive wear of the natural teeth.
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## **DENTURE BREAKAGE/REPAIR**

### **Why would my denture break?**

Modern technology has produced plastics used in denture fabrication that are very durable and exceptionally resilient. However, even the strongest denture plastics are susceptible to both fracture and wearing under certain circumstances. Accidentally dropping the denture onto a hard surface may result in fractures of pink denture base or chipping of the denture teeth. Patients who can generate exceptionally strong biting force or those who subconsciously grind their teeth together may notice a wearing away of the denture tooth material. Vigorous scrubbing of the denture with highly abrasive cleaning agents and overly stiff brushes may result of a slow deterioration of both the denture base and denture teeth making the prosthesis susceptible to fracture.

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### **What am I supposed to do while my denture is being repaired or maintained?**

The construction of a duplicate denture may be considered an insurance policy to be used in the event that the regular denture requires maintenance, or it may be considered the first step in treating a patient who has fractured a denture. The use of a duplicate denture will provide a reasonably acceptable esthetic substitute while the regular denture is being repaired, maintained, or replaced. While the duplicate denture may be fabricated at any time, it is generally made immediately after a new denture is provided to the patient. The duplicate denture is not as accurate, or as esthetic, or as durable as the original denture, but it is adequate and is only intended for short-term use. Because of the way the duplicate denture is constructed, its cost is generally considerably less than the original denture. The duplicate denture should be adjusted or relined on an annual basis, just as the original denture is maintained, so as to be ready for use at a moment's notice.

However, some patients elect to have their duplicate denture relined and/or adjusted only when they need to wear it. Following this course of treatment means that the patient may have to wait to wear their duplicate denture until an appointment can be scheduled with a dentist to complete the necessary reline and/or adjustments. Luckily, the reline of a duplicate denture can be completed in the dentist's office during a single appointment so that the patient can leave with an adequately fitting and comfortable prosthesis.

All dentures require periodic maintenance to accommodate for constantly changing conditions of the edentulous jaws. Periodic maintenance may also be required to maintain, repair, or replace the materials that make up the denture following normal deterioration or catastrophic fracture of the prosthesis. While some denture relines may be completed during one office visit, more durable relines require that a dentist keep the denture for longer periods of time. For example, replacing all the pink plastic portion of the denture, a process referred to as a rebase, may take several days. If the patient is in possession of a duplicate denture, the need to complete this lengthy maintenance procedure can be accomplished without causing embarrassment to the patient.

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## **DRY MOUTH AND THE DENTURE PATIENT**

### **What is dry mouth?**

Persistent dry mouth, commonly referred to as xerostomia, can adversely affect the patient's ability to comfortably and functionally manage their dentures.

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### **Why is saliva important to denture wearers?**

In order for dentures to be comfortably stable in the mouth, intimate contact between the dentures and the underlying gums must be achieved and maintained during chewing, swallowing, and speaking. The presence of an adequate amount and consistency of saliva between the dentures and gums is essential. When the dentures fits accurately, the physical adherence of saliva to the denture and to the gums provides a substantial force which aids in denture retention and stability. Additionally, in the absence of saliva's the lubricating effects, the gum, cheek and lip tissues may become irritated as the dentures move during chewing, swallowing and speaking.

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### **What causes dry mouth?**

**Medications:** Many commonly prescribed medications, particularly in elderly individuals, have xerostomia as a possible side effect. This problem is readily compounded when the patients is taking multiple prescription medications.

**Aging:** Salivary flow may diminish in some individuals with age. However, concomitant treatment with multiple medications may also be an overriding factor in the elderly population.

**Illnesses:** Specific illnesses and disease processes are associated with xerostomia, such as chronic diarrhea, liver dysfunction, diabetes, anemia, Sjogren's syndrome, and so forth.

**Radiation therapy:** The radiation treatment of cancer patients, particularly when affected areas involve the head and neck regions, may result in dry mouth. The type and amount of radiation used will determine the extent of damage caused to the oral salivary glands and, in turn, the degree of saliva reduction.

**Oral habits:** Chronic mouth breathing and inadequate fluid consumption are very common causes of xerostomia.

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### **How can xerostomia be managed?**

Appropriate management of dry mouth requires that the problem be clearly understood and that its cause be determined. If possible, the factors causing of the dry oral condition should be eliminated. However, when this is not possible, and the condition is persistent and progressive, alternative approaches must be taken. Several of the possible approaches to managing xerostomia, include:

**Modify medications:** If a certain medication is suspected of causing xerostomia, consultation with the patient's physician may permit substitution to an equally effective drug that does not cause dry mouth, or causes it to a lesser extent. Unfortunately, drug substitution is often not possible. Under no circumstances should a patient discontinue or attempt to change a medication without the approval of their physician. To do otherwise may result in serious complications, illness, or death.

**Sialagogues:** These substances stimulate the production of saliva. There are basically two forms of sialagogues. Gustatory sialagogues, such as sugar-free hard candies, will frequently cause some increase in salivation. Citrus flavored, sugar-free hard candies, such as lemon, are

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sometimes more effective than others. While sugar free gum, specially formulated to avoid sticking to dentures, has been recommended for the stimulation of saliva production, the process of chewing gum may irritate already poorly lubricated tissues by inducing denture movement. Pharmaceutical sialagogues, which are in the parasympathomimetic class of drugs, may improve saliva production, but must be prescribed by a physician. However, the patient's health status must permit the use of these medications.

**Salivary substitutes:** Solutions are commercially available that help keep the mouth moist and lubricated. Frequent application of these solutions is necessary thus requiring that the patient have the saliva substitute with them at all times.

**Water:** Water is often used to moisten dry oral tissues in place of more expensive, commercially available salivary substitutes. Regularly drinking of small amounts of water may both hydrate tissues and facilitate some increase in saliva production. While increased intake of water is generally considered healthy, individuals with specific medical conditions such as, but not limited to, congestive heart failure should first check with their physician before increasing their routine consumption of water.

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#### **Are there alternative denture treatments for patients suffering from xerostomia?**

Those patients who are not able to comfortably wear conventional dentures, due to severe xerostomia, should consider implant-supported dentures. The increased denture stability offered by dental implants may reduce tissue irritation caused by movement of the denture during chewing, swallowing and speaking. These patients should understand that when dental implants are used to support dentures, intense oral hygiene practices are required to maintain healthy implants in the presence of reduced salivary production. Consultation with a qualified dentist will help the patient determine which treatment approach is best for them.

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## **COMPREHENSIVE DENTURE CHECK-UPS**

#### **Why is there a need for check-ups?**

Routine, periodic and comprehensive examinations provided by a dentist are essential to ensure the continued proper functioning of the denture, and to provide all needed maintenance for total oral health.

There are several reasons not to overlook the importance of scheduling periodic examinations of your denture:

1. It may loosen! As is frequently observed, the jawbone, or alveolar ridges, shrink in size and become smaller due to gradual but continuing bone loss. This process is known as bone resorption. Resorption is an inevitable occurrence following loss of all of the natural teeth, but will vary in degree between different individuals. The result of continued bone while wearing a denture is that the denture will fit less accurately and become increasingly loose.
2. It may wear! During normal use, the denture teeth will eventually show signs of wear. The degree of wear of the denture teeth may be accelerated if the patient unconsciously grinds, or bruxes, the teeth together. In addition, uneven and irregular tooth wear may develop if the denture shifts in the patient's mouth as it becomes loose due to progressive alveolar ridge resorption. Unfortunately, continued uneven and irregular denture tooth wear will result in further shifting of

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the denture, potentially accelerating normal ridge resorption.

3. It may cause sore spots! With loosening of the denture and wear of the denture teeth, the shifting of the denture against the underlying gum tissue frequently results in rubs, chafes, or abrasions on the gums. Resulting irritation and soreness may be associated with various types of pathology, including accelerated bone loss. This is a gradual, unrelenting process that may result in progressive bone loss, thinning of overlying gum tissues and the need to prematurely replace a denture.

If these problems are detected during routine, periodic and comprehensive examinations, corrective intervention may prevent damage to the alveolar ridges and/or dentures. Problems identified during routine examination may be treated by adding plastic to the inside of a denture to reestablish an accurate fit between the denture and the underlying alveolar ridge. This corrective process is called relining or rebasing the denture. In addition, irregularly worn teeth may be adjusted, replaced, or rebuilt. Eventually, through routine dental examination, the dentures may be identified as having deteriorated to an extent that requires the construction of new dentures in order to achieve optimal oral health and function.

**What other benefits may be derived from routine check-up?**

Periodic adjustment of the dentures may be indicated to maintain a proper relationship between the upper and the lower jaws. When indicated, this type of adjustment may help to improve esthetics. Keeping the jaws in a proper functional relationship may provide optimal support to the facial tissues and help prevent the appearance of premature aging.

The temporomandibular joints, or TMJs, are the joints located in front of each ear. They may undergo constant change in shape throughout life by a process called bone remodeling. This process is a functional response. If improper jaw function occurs, as a result of improperly fitting dentures or an inaccurate bite, it is possible for the TMJs to remodel into an unhealthy relationship. This could result in impaired jaw function, headaches and other head and neck pains.

More importantly than identifying and correcting denture problems during the routine dental examination, is the opportunity to detect serious oral conditions, such as cancer, that may have far greater consequences for the patient. Discovered at an early stage, cancer may be treatable.

**THE PROBLEMATIC LOWER DENTURE**

**Why is the lower denture problematic?**

By their very nature, dentures are only marginal substitutes for the natural teeth. Lacking the support, stability, and retention inherent with natural teeth, denture wearers should expect a variety of problems that they must accommodate to in order to successful function with their prostheses. When comparing the success of upper dentures to their lower counterparts, it is clearly lower dentures that are more troublesome for most individuals.

**What are the inherent problems with lower dentures?**

1. The lower denture is constantly in contact with movable tissues and structures in the mouth. The

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two oral structures that move the most during normal activity are the tongue and those structures that lie below the tongue, called the floor of the mouth. During normal chewing, swallowing, and speaking, movement of the tongue and the floor of the mouth may significantly disrupt the stability of the lower denture.

2. The lower denture has less surface area for support. When compared to the upper denture that rests on the relatively broad and flat roof of the mouth, or palate, the lower denture must often rest on a thin, knife-edge ridge of bone.

3. As bone resorbs over time, the quality of support to be derived from the lower jawbone dramatically changes. For example, the lower jawbone ridge height is reduced, the quality of the gum tissues that overlie the lower jawbone deteriorates and becomes mobile and changing muscle and frenum attachments to the lower jawbone increasingly produce dislodging forces.

While these problems are inherent, and perhaps inevitable, all patients are different and will likely be affected to varying degrees by these problems. Luckily, there are several ways to approach these problems in order to improve the patient's chances for success.

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#### **What are some treatment considerations for improving lower denture stability?**

A thin, band-like tissue extension (called a frenum) may attach between a jaw ridge (called alveolar ridge) and the inside of the cheeks or lips. This band of tissue may activate and move while the patient chews, swallows or speaks. Once mobile the frenum can lift a denture from its resting, stable position on the alveolar ridge. If such activity is identified in the frenum, this attachment may be surgically moved to avoid dislodgment of the denture. This surgical procedure is called a frenectomy.

Over time, following the loss of the teeth, the alveolar ridge slowly loses bone. This bone loss is called resorption. Most notable in patients who have been without teeth for long periods of time is the loss of alveolar ridge height. As alveolar ridge height is lost, so is the vestibule, or space between the lip and alveolar ridge. Because adequate vestibular depth is favorable for denture success, surgical extension of the vestibule (called vestibuloplasty) may provide an advantage.

As bone is resorbed from the alveolar ridge over time, it may often be rebuilt by surgically placing various substances beneath the gum tissues. This surgical procedure is called alveolar ridge augmentation.

When a person eats, swallows and speaks the lips and cheeks exert forces towards the inside of the mouth, while the tongue exerts an outward force. There is a space defined between the tongue's outward force and the inward force of the lips and cheeks, called the neutral zone. If the lower denture is constructed so as to reside within the neutral zone, then the natural forces exerted by the lips, cheeks, and tongue will act to stabilize and retain the lower denture rather than to cause dislodgment.

Surgically placing dental implants into the jawbone and fabricating the lower denture to overly and connect to these implants will help stabilize a lower denture during normal function. The mechanism used to permit reliable connection between the dental implants and the lower denture also allows comfortable and easy removal of the denture for routine oral hygiene procedures.

Ensuring that upper and lower teeth contact optimally when the teeth are brought into contact (called balanced occlusion) is a basic, structural means of stabilizing a lower denture. Premature

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contact between the teeth on the left side of the denture, for example, may cause the denture to be dislodged from the lower alveolar ridge. Even contact between all denture teeth when the patient closes, promotes stability of the lower denture.

Constructing the lower denture to accurately fit on the alveolar ridge may aid in the stability of the prosthesis. Because normal denture plastics slightly distort during the fabrication process, the use of an accurately fitting metal base may improve the lower denture's fit. Additionally, incorporation of a metal base will improve the lower denture's strength and increase its weight, which may aid in stability.

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#### **What's the best approach?**

Of all the suggestions provided here, no one will result in a successful outcome for all patients. Frequently several of these approaches are combined when deemed suitable. A thorough examination by a licensed dentist can best determine the most appropriate means of achieving optimal stability of the lower denture in each uniquely individual situation.

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## **IMPLANT OVERDENTURES**

#### **What are implant overdentures?**

A conventional denture replaces all the missing teeth in that jaw. It contacts, and is supported by, the gum tissues covering the remaining jawbone. A conventional overdenture also replaces all the missing teeth, but rests on both the soft tissues covering the remaining jawbone and on one or more remaining natural tooth roots. An implant overdenture also replaces all the missing teeth in that jaw, but rests on, and is connects to, cylinder-like devices, called dental implants, that have been surgically placed into the jawbone.

The implant overdenture looks similar to a conventional denture or a conventional overdenture. However, the portion of the implant overdenture that overlies the dental implants is modified to incorporate attachment mechanisms that fasten directly to the implants as they emerge through the gums. This arrangement permits secure retention of the denture while chewing, swallowing and speaking, yet permits easy removal and replacement of the overdenture for personal oral hygiene procedures.

There are two phases of treatment needed to provide a patient with an implant overdenture. The first is the surgical phase, which includes surgical placement of the implants into the jawbone followed by a prescribed healing period. The second phase is the restorative phase, during which the implant overdenture is constructed.

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#### **What does dental implant surgery involve?**

A dental implant is a metallic, cylindrical shaped device. Most implants are made from titanium because this metal is very biocompatible and is well tolerated by the human body. Each implant is inserted into the jawbone in specific positions and at very specific angles using careful surgical techniques. After the implants have been surgically placed, the gum tissues are closed using several sutures.

While acceptable results can be achieved using a minimum of two implants to support an

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overdenture, additional implants may be indicated depending on the needs of the patient, oral conditions, and anatomical limitations. As a general rule, the more implant used to support the overdenture, the better the denture's support and stability during chewing, swallowing and speaking.

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**What happens after the implant surgery?**

Following the implant surgery, the patient must not wear a denture for one week to permit the gum tissues ample opportunity to begin the healing process. Once the gum tissues have sufficiently healed, a treatment denture can be used to assist chewing, swallowing, and speaking. The patient's original denture may serve as the treatment denture. With modifications, the original denture may be adapted to fit accurately over the surgical sites. If the original denture fits poorly, or is otherwise inadequate, a new treatment denture must be constructed and worn during the healing period.

While it is quite common for the gum tissues to quickly heal, the jawbone surrounding the dental implants takes quite a bit longer. Typically, the implants are left undisturbed for four to six months. During this healing period, the jawbone heals and attaches to the implant surface, securely anchoring the implant in the jawbone. Firm anchorage of the implant in the bone is called osseointegration. It is very important that during this period of osseointegration, the implants remain undisturbed. To achieve this goal, the patient is instructed to avoid hard foods and foods that are difficult to chew. Additionally, a soft lining material must be placed in the denture to provide a cushion-like effect between the hard denture and the healing jawbone.

Once osseointegration has occurred, a second minor surgery is performed to exposing the implants. Next, short extension posts are screw-fastened directly to the implants. The extension posts extend through the gums into the oral cavity. Although this second surgery is relatively minor, the gums must be permitted adequate time to heal prior to beginning construction of the overdenture. During this healing period, the treatment denture is modified to accommodate the extension post and protect the surgical area during gum healing.

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**What will the implant-supported overdenture be like?**

In order to achieve firm connection between the overdenture and the dental implants, a variety of attachment mechanisms are available. The two basic attachment configurations include (1) a single, metal bar constructed to screw fastens to each implant and firmly clip to the overdenture, or (2) individual snap-like attachments that screw fasten to each of the implants and firmly couple to the overdenture.

Once the mechanical attachment mechanism has been constructed and fastened to the implants, the overdenture can be constructed. During fabrication of the overdenture, special provisions must be made to accommodate the attachments on the inside surface of the denture. If a metal bar is the attachment of choice, special clips must be processed on the inner surface of the overdenture so that they align with and clamp to the bar on placement of the denture in the mouth. On the other hand, if individual snap attachments are used, the snaps mating components must be processed in the overdenture to permit firm attachment on overdenture placement in the mouth.

When properly constructed, the attachment mechanism used for implant overdentures will provide secure retention during chewing, swallowing and speaking, and permit the overdenture to be easily removed and replaced during routine personal hygiene procedures.

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### **Does the implant overdenture require special maintenance?**

Exemplary oral hygiene is essential when implants are used to support an overdenture. The patient must perform routine and thorough cleaning of the gums, attachment mechanism, and overdenture in order to maintain optimal health of the oral cavity and avoid the development of inflammation in the tissues surrounding the implants. Additionally, regular professional evaluations must be scheduled to assure health of the oral cavity and provide professional cleanings when necessary.

All mechanical devices require close evaluation of periodic repair and maintenance. The implant overdenture is no exception to this rule! Because of the precise fit between the attachment components used to retain the overdenture, attachment wear is routinely observed. Therefore, removal and replacement of worn attachment parts is necessary to maintain optimal function of the overdenture. Most attachment systems currently available used small screws to fasten the attachments to the implants. If these screws loosen over time, the retention and stability of the overdenture will be compromised. Thus in order to maintain proper functioning of the overdenture, screw tightness must be professionally checked on a routine basis.

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### **How long will an implant overdentures last?**

Current research suggests that for carefully selected patients, properly constructed and well-maintained implant restorations can last thirty years or more. In fact, an implant restoration may last for a lifetime, or it may deteriorate in only a few years! Many factors may favorably or adversely impact the life expectancy of implant restorations, such as appropriate patient selection, oral hygiene, general physical health, oral habits (such as smoking, grinding, clenching), and routine maintenance. Physical deterioration requiring repair and replacement is inevitable in all mechanical systems. It is not uncommon for the overdenture to show signs of deterioration necessitating replacement, while the attachment mechanisms remain in perfect condition. Likewise, replacement of attachment components is often indicated only one year after receiving the overdenture. Routine professional evaluation is essential to identify potential problems and accomplish the necessary repairs before irreversible damage occurs to the implants or the overdenture.

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## **PRECISION AND SEMI-PRECISION PARTIAL DENTURES**

### **What are precision and semi-precision partial dentures?**

Precision and semi-precision partial dentures, like conventional partial dentures, replace missing natural teeth with artificial teeth. Also called attachment partial dentures, the means by which they are retained in the mouth is quite different than a conventional partial denture that uses clasps. To better understand the design of an attachment partial denture, it may help to review the basic design characteristics of conventional partial denture clasps.

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### **How does a partial denture clasp function?**

Once properly placed in the mouth, most partial dentures are retained and stabilized by clasps. These thin, finger-like projections are typically made of special resilient metal alloys. However, in certain cases, plastic or plastic-like materials may be used to construct the clasps.

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Of the patient's remaining natural teeth, only a specific few, called abutments, are selected by the dentist to receive clasps. The clasps are designed to contact and wrap around these abutment teeth. In doing so, the clasps provide stability so that the partial denture stays comfortably in place during normal functional activities. It is sometimes necessary to reshape the abutment teeth so that optimal contact can be achieved with the clasps. This reshaping process may involve minor grinding on the tooth surface, or it may necessitate the construction of a new crown.

Properly designed clasps will gently spring around the abutment teeth when the partial denture is placed into the mouth. Simply stated, a partial denture is held in place during normal eating, speaking and other activities because the clasps are designed to resist springing off of the abutment teeth. It is important that the capacity of the clasps to resist springing off of the abutment teeth is not so great as to prevent easy and comfortable removal, by the patient, whenever necessary.

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### **What are some of the problems with clasps?**

Despite many years of successfully using conventional partial dentures with conventional clasp designs, they do have some drawbacks. Depending on the positional of the remaining natural teeth, clasps may at times be esthetically objectionable. Because of the strict rules governing clasp design, this display of the clasps may be unavoidable. Although minor clasp display is acceptable to many patients, other individuals will not tolerate even the slightest clasp display due to personal circumstances and esthetic demand.

In order for clasps to function properly, the remaining natural teeth must possess specific shapes and contours. In the absence of these optimal contours, may require that crowns be fabricated and placed. In extreme circumstances necessitating many crowns, The extensive preparation of natural teeth, and the elevated cost of such procedures may contraindicate use of partial dentures with conventional clasps.

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### **Are there any alternatives to conventional partial dentures?**

Alternatives to conventional partial dentures that use clasps may be placed in two categories. Both of these categories substitute attachments for clasps when considering the designing the partial denture, thus eliminating the unsightly display of metal.

**Semi-precision** partial dentures are retained in the mouth by means of mechanical interlocking components, or attachments. A small, specifically shaped device extending from the partial denture fits precisely into or on a complementary receptacle supported by a natural tooth, which has been fitted with a crown. When properly placed into the mouth, these interlocking attachments fit snugly together offering both stability and retention to the partial denture during normal function. Because of their small size and due to the design of the partial denture, these attachments are readily hidden from view.

**Precision** partial dentures are similar to semi-precision partial dentures except that the mechanical interlocking components are manufactured to extremely high tolerances and are held together by precise alignment. Because of the precise fit between the extension from the partial denture and the receptacle in the natural tooth crown, mechanical binding occurs when forces work to dislodge the partial denture during function. This binding, in turn, results in retention and stability of the partial denture. Much like semi-precision attachments, these precision attachments are very small and easily hidden from view.

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**What are the advantages and disadvantages of semi-precision and precision partial dentures?**

Advantages of semi-precision and precision partial dentures include:

1. Improved appearance due to the lack of visible clasps;
2. Since no metal components are present to interrupt the continuity between natural teeth and prosthetic teeth, the transition from the partial denture to the real teeth appears very natural; and
3. May provide better distribution of force to the remaining natural teeth than is possible with a conventional partial denture with clasps.

Disadvantages of semi-precision and precision partial dentures include:

1. Increased cost due to technically demanding procedures;
2. Typically require placing crowns on several natural teeth;
3. More difficult to fabricate and adjust; and
4. Periodic replacement of attachment components is typically required.

**Which type of partial denture is best?**

Every patient has unique oral conditions and oral health needs. Determination of the most appropriate design for a removable partial denture must follow thorough examination by a licensed dentist and must take into account the patient's functional and esthetic desires.

## **CONVENTIONAL REMOVABLE PARTIAL DENTURES**

**What exactly are removable partial dentures?**

When a person is missing some of their teeth, yet maintains a number of healthy teeth, the missing teeth may be replaced by constructing a device called a removable partial denture. Other common names for this dental device are "partials", "partial plates", and "partial dentures". The partial denture is typically composed of a metal portion and a plastic portion, although some partial dentures are constructed entirely from plastic. So that the partial denture remains securely positioned in the mouth, clasps are used to engage several of the remaining natural teeth. These clasps are thin finger-like structures, commonly made of resilient metals or plastics, that rest upon and wrap around several of the remaining natural teeth. Clasps function to keep the partial denture securely in place, while allowing the person to readily remove it from their mouth for regular cleaning of both the partial denture and the remaining natural teeth.

**Why are partial dentures be needed?  
Why are partial dentures be needed?  
Why are partial dentures be needed?**

**Why are partial dentures be needed?**

1. Replace missing teeth when several health natural teeth remain;
2. Improve the ability to chew with confidence;
3. Permits the chewing of harder, more substantial foods;
4. Helps maintain a healthier and socially acceptable mouth;
5. Aids in the preservation of remaining natural teeth;
6. Help prevent, or treat, problems with the TMJ (the jaw joint);
7. May provide for improve speech;
8. Helps develop a more pleasing and confident smile;
9. Lends support to the cheeks and lips, resulting in a more youthful appearance;
10. Enhance the individual's self esteem;
11. Provides for tooth replacement that is relatively economical;
12. If additional natural teeth are lost in the future, it is often possible to simply add denture teeth to the partial denture for acceptable replacement;
13. Most often, there is no need to place crowns on the remaining natural teeth; and
14. Typically, partial dentures are easy to repair if they are broken;

**Are conventional partial dentures always unattractive?**

Generally, clasps are designed to be reasonably esthetic, so that they are not obtrusive to the esthetic display of teeth or the attractiveness of the smile. In fact, it is often possible for clasps to be designed so that they are entirely hidden from view. However, depending on certain conditions in the mouth and the health of the remaining teeth, it may be necessary to show some portion of the clasps. Often this does not pose a significant esthetic problem. In certain situations, it may be possible to use special attachment mechanisms rather than clasps, thereby eliminating the exposure of clasps in esthetically demanding situations. Incorporating these attachments into the partial denture design is technically complicated. Attachments may be referred to as either precision or semi-precision attachments.

**How long should a partial denture last?**

It goes without saying that "accidents happen" and the mouth and teeth are constantly changing. The fit of partial dentures may deteriorate over time as conditions in the mouth progressively change. Accidentally dropping the partial denture may bend or break critical components causing the denture to fit improperly. Long term use may result in the partial denture simply "wearing out". In fact, there is nothing that a dentist makes for the mouth that should be considered "permanent".

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It is important to understand that it is possible to repair many minor problems encountered with partial dentures.

On average, a partial denture may last five years. Depending on conditions in the mouth, the health of the remaining teeth, and the quality of personal hygiene and professional maintenance, certain partial dentures may last less than five years while others last much longer.

**How often should a partial denture be checked?**

It is best to visit your dentists for routine evaluation twice a year. At each visit, the dentist will check the partial denture for adequacy of fit and structural integrity. It is very important that in addition to examination of the partial denture, the dentists also evaluate the health of the entire mouth, including the remaining teeth. Left uncorrected, minor problems can progress to major problems leading to the loss of additional natural teeth or premature repair or replacement of the partial denture.

**When will my partial denture need to be relined?**

The jaw bone, or ridge, supporting the partial denture will constantly change. With this change, the fit of the partial denture may deteriorate. As part of the routine evaluation provided by the dentist, modification of the partial denture may be provided to improve the fit of the partial denture. This routine modification is called "relining". Although dependent on changes of the jaw bone which vary from patient to patient, relining the partial dentures should be accomplished once a year, on average, to facilitate optimal fit, function, and comfort of the partial denture. Thorough oral evaluation by a licensed dentist will determine when a reline procedure is needed, and when a reline will no longer adequately restore proper function, necessitating the construction of a new partial denture.

**CONVENTIONAL OVERDENTURES**

**What is a conventional overdenture?**

A conventional denture contacts and is supported by the soft tissues covering the remaining jawbone. A conventional overdenture rests not only on the soft tissues covering the remaining jawbone, but also on one or more remaining natural tooth roots. Although this type of denture has been used for quite some time, to appreciate this treatment approach it will be necessary to review some facts.

**What happens to the jawbone following loss of the natural teeth?**

The body tends to conserve energy and nutrients by maintaining only structures with apparent immediate value. A typical example is the reduced muscle bulk of broken leg that is held immobile by a full-leg cast for a month or more. It has been suggested that a similar process may occur when the natural teeth are lost. The portion of the jawbone that originally surrounds the tooth roots is called the alveolar ridge. It has been theorized that once the natural teeth are lost from the mouth, the alveolar ridge no longer serves a valuable function. As such, the alveolar bone begins the inevitable process of resorption, or shrinkage. Individuals may be affected to varying degrees by the resorptive process, although for most the process proceeds rapidly during the first year

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following tooth loss and slows during subsequent years. Ultimately, patients who have been missing natural teeth for long periods of time typically demonstrate extreme alveolar bone loss that adversely affects their ability to function satisfactorily with conventional dentures. It appears that preventing the resorption of alveolar bone following the loss of natural teeth facilitates the individual's ability to function with dentures by improving the stability of the dentures during chewing, swallowing, and speaking.

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**Can jawbone resorption be prevented?**

Since extreme resorption of the alveolar bone only begins following loss of the natural teeth, it seems reasonable to believe that maintenance of the natural teeth may prevent this bone loss. In fact history has proven this to be true. Specifically, it is the maintenance of the healthy root portion of the natural tooth in the alveolar bone that is most important.

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**What philosophies support the use of overdentures?**

It is not uncommon that most of the remaining natural teeth in a patient's mouth are affected by advanced dental disease. Frequently, however, several of these teeth may possess reasonably healthy roots, even though their crowns have been affected by significant disease. Since maintaining tooth roots in the jawbone has been shown to prevent the bone resorption process, it may be beneficial to treat reasonably healthy roots so that they may remain in the bone as long as possible. Not only will their presence prevent future alveolar bone loss, but being firmly anchored in the bone, these roots will contribute to predictable support of the denture during normal chewing, swallowing, and speaking. Determination of the most appropriate use of remaining natural teeth and consideration of overdenture therapy must follow thorough and comprehensive examination by a licensed dentist.

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**What procedures are necessary for overdenture therapy?**

1. Since only the root of the tooth will be maintained, the tooth crown (that portion of the tooth above the gums) must be removed. Removal of the tooth crown typically requires that root canal therapy, if not already done, be accomplished.
  2. The very small projection of the root, above the gums, is carefully rounded and highly polished. In certain circumstances, a dome-shaped metal covering can be cemented to this root projection.
  3. It is possible to place small mechanical devices, or attachments, on to the root projections to facilitate both retention and stability of the overdenture during chewing, swallowing, and speaking. The portion of the overdenture overlying these attachments is equipped with a receptacle capable of interlocking with, or clipping to, the attachment. When the overdenture is properly placed into the mouth, these attachments engage to keep the overdenture securely in place, while allowing the person to easily remove the denture from their mouth for regular cleaning of both the overdenture and the remaining natural root.
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**What are the advantages of overdentures?**

1. By maintaining the tooth root in the jawbone, the resorptive process that normally affects the alveolar process is prevented.

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2. Since the roots remain firmly embedded in the jawbone, they also maintain much of their sensory capability. Therefore, the patient can better “feel” the denture during normal chewing, swallowing, and speaking activities, thus improving function.
  3. Even when attachments are not incorporated retention and stability of the denture is typically improved.
  4. The tooth roots will serve to firmly resist the pressure delivered to the jawbone by the denture during chewing. This reduction in pressure is believed to aid in the long term preservation of alveolar bone by prohibiting the resorptive process.
  5. The psychological impact of having all one’s teeth remove can be devastating. By maintaining several tooth roots in the jawbone, the patient can functionally, mechanically, and psychologically benefit from their presence.
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#### **Are there any disadvantages of overdentures?**

1. Because the tooth roots will be covered by the overdenture for extended periods of time, scrupulous oral hygiene is essential in order prevent decay and gum disease.
  2. In the areas where the tooth roots are maintained, the overdenture may feel somewhat bulkier than a typical denture.
  3. With the possibility of natural tooth and gum problems, in addition to the need for routine maintenance of the overdenture, more frequent professional examinations are necessary.
  4. Generally speaking, overdenture therapy is more expensive than treatment involving the construction of a typical denture.
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## **THE METAL-BASE DENTURE**

#### **What is a metal-base denture?**

A metal-base denture is one in which a portion of the denture is made of metal rather than pink denture plastic. Although appropriate for both upper and lower dentures, this procedure is usually applied to the lower denture.

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#### **How many types of metal-base dentures are there?**

**The standard metal-base denture:** The standard metal-base denture is constructed so that the metal portion of the denture is in direct contact with underlying supporting tissues. Today, the metal-base is commonly fabricated from a special, medical-grade alloy that is hypoallergenic and exceptionally biocompatible. Generally the gum tissues in contact with this type of material are very healthy in appearance.

**A modified metal-base denture:** A modified design incorporates the metal portion of the denture within the confines of the pink denture plastic. This permits a soft or hard plastic liner to be interposed between the metal and the supporting gum tissues.

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