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5th stage / lec 8 ***Dr. Hasanein Al-namel***

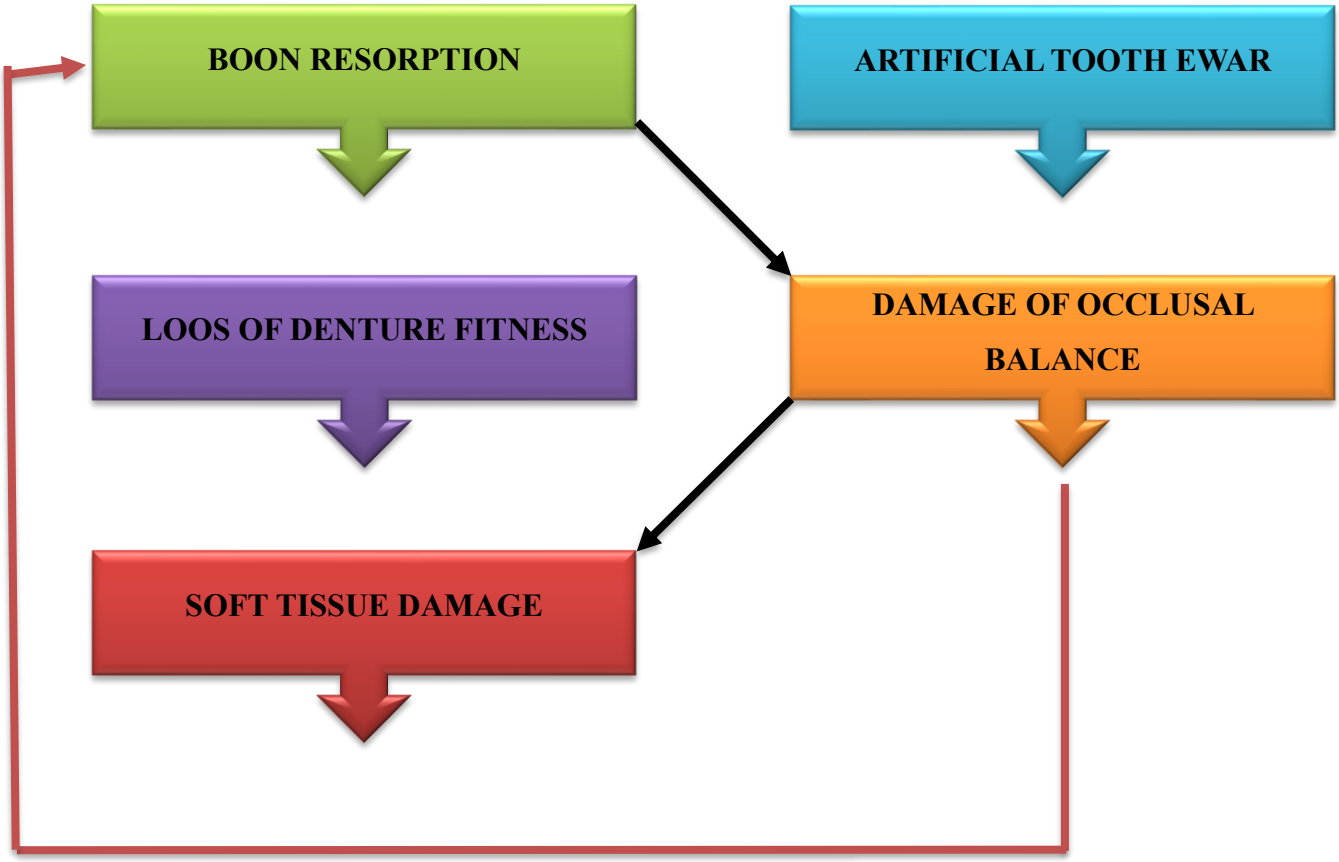
Complications in complete denture wearers

In this lecture, we stress the importance of planning a program of recall appointments (follow-up appointments) after fitting complete dentures, to ensure that the tissues are not being damaged and that the dentures are functioning efficiently and comfortably. A recall visit also gives the patient an opportunity to seek advice on any concerns.

To reduce the risk of mucosal damage and bone resorption in complete denture wearers, a check should be made every year. It is important that the patient is not under the mistaken belief that once the artificial substitute for the natural teeth has been provided there will be no further problems and no need for further maintenance. Epidemiological studies of the edentulous population have shown that most patients with complete dentures have pathologic tissue changes that require treatment. Long-term recall appointments were done because the following changes occurred

- Mucosal changes
- Bone resorption
- Occlusal changes
- Adaptation of patient.

The cycle of Complications in complete Denture wearers



All these changes may cause the following prosthetic complications that have been recorded as a result of research done by Hakan B. et al 2012 for complete denture wearers

1. Loss of retention (62.5%)
2. Existence of any denture irritation or ulceration (51.6%)
3. Existence of any debonded/fractured artificial teeth (26.6%)
4. Existence of any fracture in the denture base (31.3%)
5. Existence of denture stomatitis (9.4%)
6. Existence of epulis fissuratum
7. Existence of inflammatory papillary hyperplasia

- **Mucosal changes**:

The need to carry out periodic checks with respect to oral cancer was stressed. In 2007, in the UK, there were 5325 new cases and 1841 deaths, with an increased prevalence in deprived communities. It should be emphasized that the typical edentulous patient falls into a risk group, as a retrospective study of patients with oral cancer showed that 59% were edentulous, tended to be older than 60 years, were tobacco and alcohol users, had a lower socioeconomic status and had a somewhat negative attitude to recall appointments.

- **Bone resorption**:

The long-term changes in the shape of the residual ridges and the consequent effect on dentures have been studied extensively. A continuing reduction in the height of the alveolar ridges over a period of 25 years has been observed. There appears to be a marked reduction in the first year of denture wearing and in the next few years, a continuing loss averaging 1 mm each year. Over periods of time, the loss in height of the anterior lower ridge is four times that of the upper. As the lower denture covers a much smaller area, the functional stress transmitted to the underlying tissues is greater than that to the upper tissues; thus, it is likely that the greater loss of mandibular bone is due to the physiological limit of this tissue being exceeded. The resorption of bone brings in its wake a loss of both occlusal vertical dimension and

rest vertical dimension. The former dimension is reduced to a greater extent and thus the freeway space is increased.

- **Occlusal changes**:

The progressive loss of fit of dentures, resulting from the resorption of bone, also leads to deterioration in occlusal balance. In the case of dentures with acrylic teeth, this occlusal deterioration can be aggravated by occlusal wear. The combination of loss of fit and occlusal imbalance encourages mucosal inflammation and further bone resorption, thus establishing a vicious cycle. It is clearly important, if oral health and function are to be maintained, that this cycle is broken by regular denture review and effective maintenance.

- **Adaptation of the patient:**

The progressive long-term deterioration of dentures that have been described is not invariably associated with a complaint. This is because adaptive changes can occur

and a tolerance can develop which allows patients to continue wearing the dentures. Thus, a considerable amount of tissue damage can go unnoticed. Whereas successful adaptation to new dentures is a prerequisite for success, a patient who tolerates slowly developing faults beyond a certain point will store up troubles for the future. In addition to the likelihood of tissue damage, reduction in rest vertical dimension and the adoption of abnormal mandibular postures create problems for both the clinician and the patient when replacement dentures are eventually required. The first long-term recall appointment should be made no more than a year after the dentures were first fitted. Thereafter, an appointment every 2 or 3 years to check on tissue health and quality of the dentures is a realistic arrangement, on the mutual understanding that the patient will attend sooner if problems develop in the meantime. The clinician should make the point that the dentures have a limited life and should stress to the patient the potential dangers of wearing dentures that have become inadequate

Treatment required at long-term recall appointments will be one, or a combination, of the following:

- Adjustment of the impression surface
- Correction of denture base extension
- Occlusal adjustment with or without a check record
- Reline or rebase of the dentures
- Construction of replacement dentures.

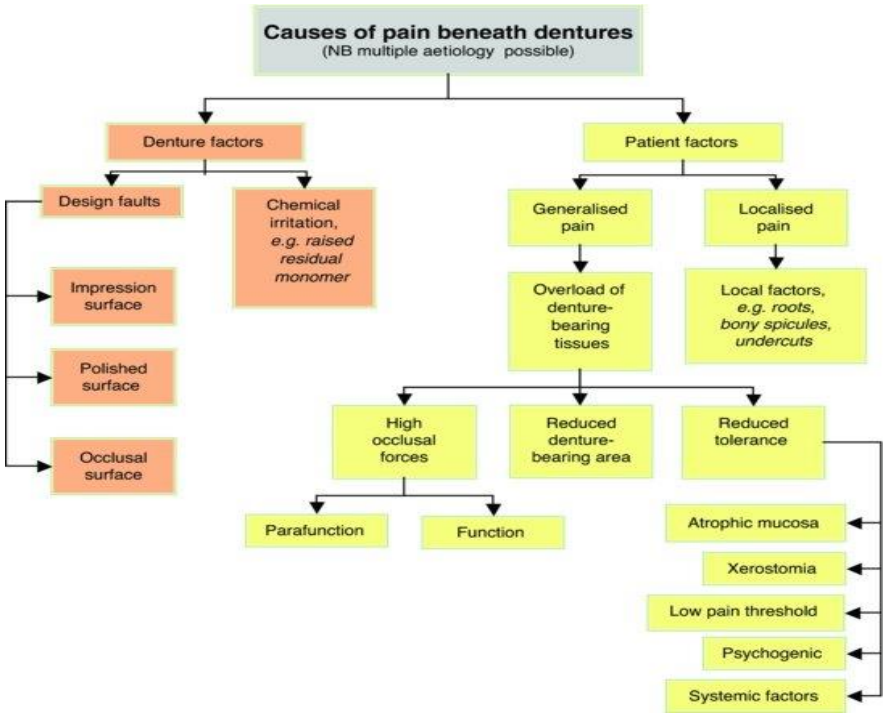
Clinical Problems and Solutions associated with a complete denture

- Pain and instability
- Lack of saliva
- Hard and soft materials for modifying the impression surface of dentures
- The flabby ridge

- Midline fracture
- Debonding of teeth
- Gagging reflex
- The burning mouth syndrome
- Disturbance of speech.

Pain and instability: In most cases, denture pain is associated with fresh, red tissues and mouth yeast infections. It can also be a result of the improper fitting of denture implants or Snap-On dentures. The most common problems associated with complete dentures are pain and instability of the dentures. They are summarized in the table below. The most likely main complaints have been indicated in each case. However, it should be remembered that there is considerable overlap between the two columns, as any cause of instability may additionally give rise to a complaint of pain. It should also be stressed that there may be more than one cause of a complaint.

Persistent pain: This problem is more often seen in the lower jaw where the area available for distribution of the occlusal load is relatively small. As noted in the table below, there are many possible causes of this complaint, which may be attributed to the denture design and to the patient.

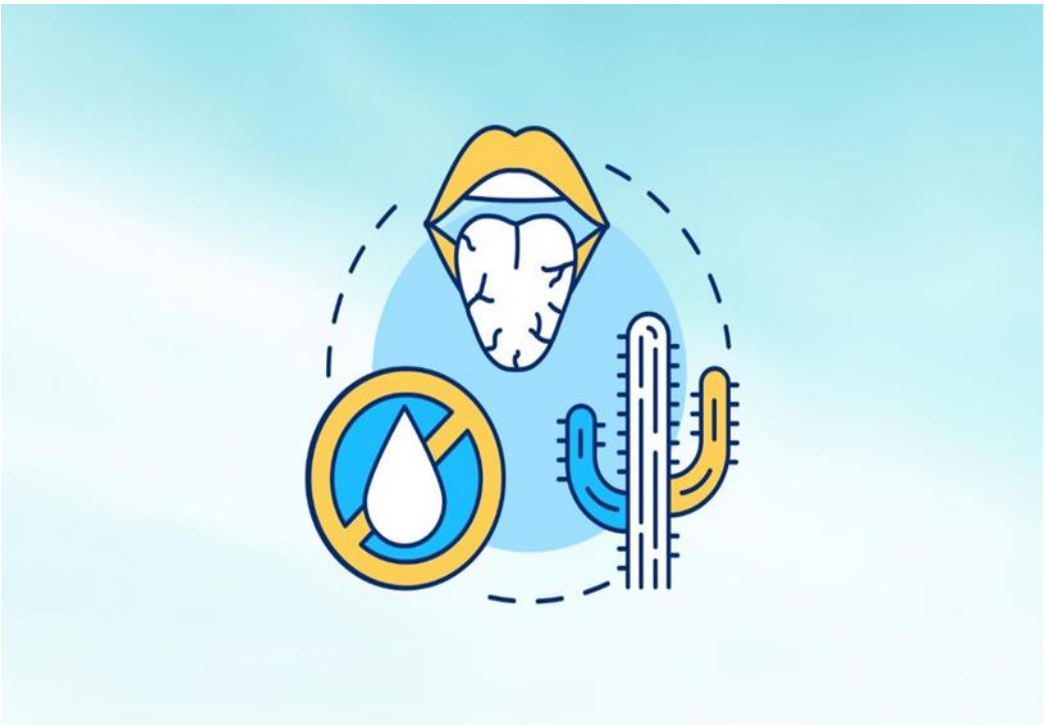


Discomfort can arise from overloading of the mucosa as a result of clenching or grinding the teeth. These occlusal habits are caused by increased activity of the masticatory muscles produced during stressful situations. In treating parafunction, the patient must be made aware of the problem and should be told that teeth should be out of contact for most of the time. It is important to reassure the patient, describe the link between stress, parafunction, and pain under dentures, and point out that there is no change in the oral mucosa. The importance of conscious relaxation should be emphasized and the patient should be strongly encouraged to leave both dentures, or at least the lower denture, out at night.

Lack of saliva: saliva possesses the following functions in the edentulous patient: Denture retention, Lubrication, mastication, and the swallowing of food, Cleansing, Taste, Digestion, and Antimicrobial, saliva which helps to maintain a normal balance of the oral flora.

Problems of reduced salivary flow A reduction, or absence of saliva (xerostomia), is likely to cause problems with all the functions listed above so that a general, and

significant, reduction in the quality-of-life results. Reduced retention of dentures is a particular problem for edentulous patients. There may also be an increased susceptibility to denture trauma resulting in complaints of pain and in some cases, burning mouth syndrome



Etiology of reduced salivary flow

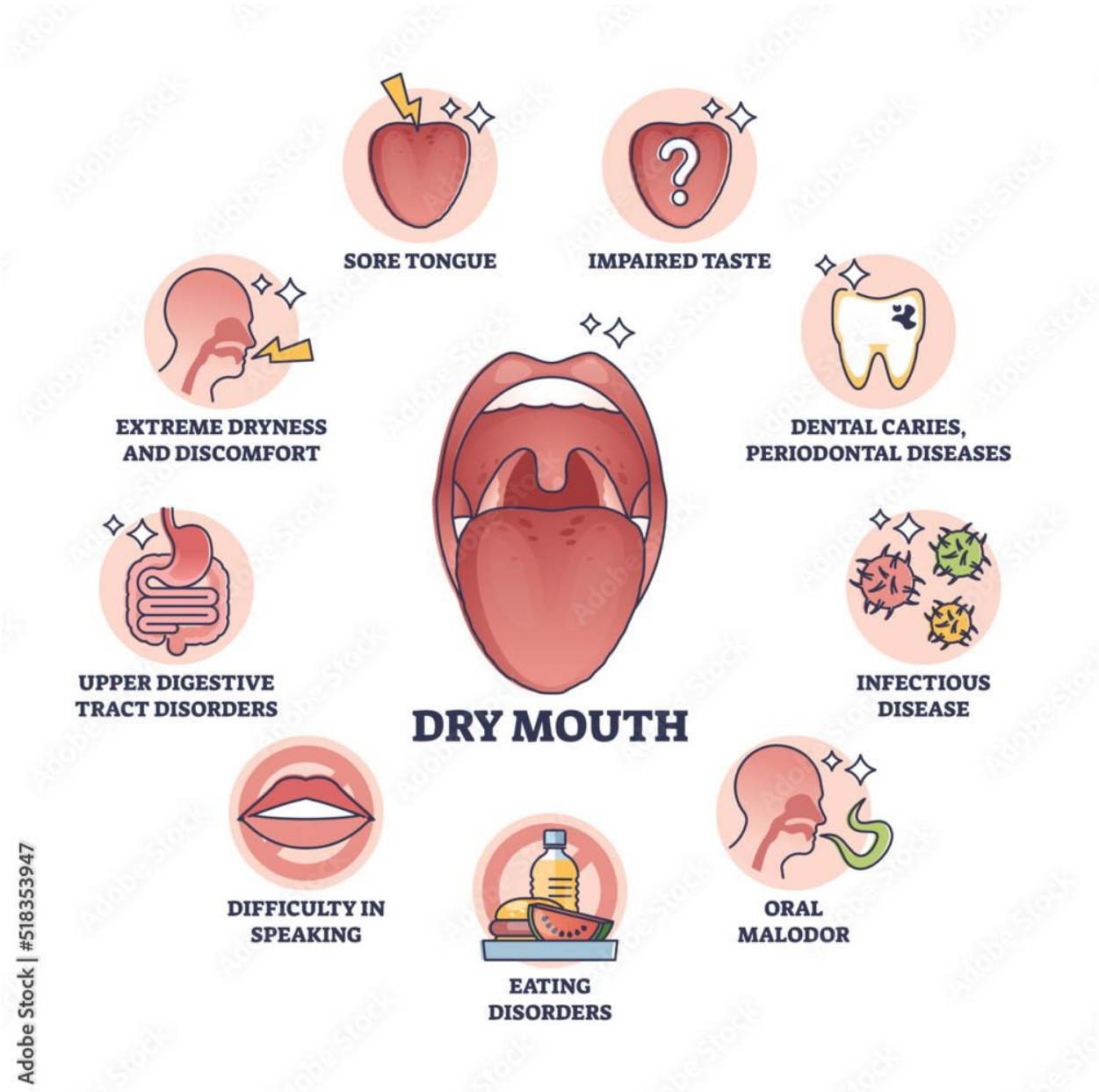
- Medical History: A full history is taken including an 'I'm taking an anti-depressant and question on current medication a diuretic for how long have you been 'One year' DRY MOUTH is a possible taking these tablets?' contributory factor to the oral complaint
- Social History: The history has revealed a number of possible causes of the persistent pain. The diagnosis can be established only after a careful examination of the patient, the mouth, and the various sets of dentures in order to confirm or deny the various possibilities. The point should be made that unless a full history is obtained some of the possible causes might never be revealed. The provision of new dentures would do little to eliminate the

problem if the persistent pain was due to a dry mouth and parafunction. However, the condition is relatively common in middle-aged and older people, the main candidates for complete dentures, with between 12% and 16% complaining of dry mouth.

The commonest causes of dry mouth (Niedermeier et al. 2000; Field et al. 2001) are:

- Adverse effects of drug therapy, e.g., tricyclic antidepressants, beta-blockers
- Depression and chronic anxiety
- Dehydration
- Mouth breathing
- Auto-immune disease like Sjögren's syndrome
- Head and neck radiotherapy
- Poorly controlled diabetes
- Smoking.

A complaint of dry mouth can occur in the absence of the clinical signs of dryness ('symptomatic xerostomia'). Under such circumstances, the physical retention of the dentures would not be expected to be diminished.



Management of dry mouth in clinical xerostomia There are intra-oral signs of dryness such as a dry, atrophic mucosa and lack of saliva pooling in the floor of the mouth. The dentist can check the dryness of the buccal mucosa simply and quickly during the examination of the patient by carrying out the 'mirror test'. For this, the dentist lightly presses the face of the mirror against the buccal mucosa and then tries to remove it. If the mirror comes away easily the mucosa is still covered by a substantial film of saliva; if the mucosa adheres to the mirror, then it is dry. Close

collaboration with the patient's general medical practitioner or with a specialist in oral medicine is often necessary. It might be possible, for example, to change an existing xerostomia drug to one less liable to reduce salivary flow. As there is a definite relationship between fluid intake and secretory performance it is essential that the patient is kept well hydrated. Chewing and energetic exercise improve salivary flow, possibly because of improved blood circulation to the glands. In cases where the flow rate cannot be improved limited relief may sometimes be obtained by the use of artificial saliva.

Measures for managing xerostomia: may be local or systemic

- **Local measures:**
  1. **Artificial saliva**. In cases where the salivary flow rate cannot be improved limited relief may sometimes be obtained by the use of artificial saliva
  2. **Denture and oral hygiene.** It is very important for a denture patient with a dry mouth to maintain an excellent level of denture hygiene. The likelihood of the proliferation of Candida albicans and other microorganisms is increased in xerostomia and therefore unless denture hygiene is maintained at a high level the denture is likely to be rapidly colonized by the micro-organism, resulting in denture stomatitis. Motivation and instruction of the patient, followed by monitoring the quality of denture hygiene are essential.
  3. **Denture retention.** In cases where an intractable dry mouth gives rise to a persistent problem of loose dentures a denture adhesive will usually provide some improvement in denture function.
- **Systemic measures:**
  1. **Treatment of an underlying disease**. It might be possible, for example, to change an existing xerostomic drug to one less liable to reduce salivary

flow. Also, if the patient is diabetic, an improved glycemic control will alleviate the xerostomia.

2. **Increasing fluid intake**. As there is a relationship between fluid intake and secretory performance, it is essential that the patient is kept well hydrated.
3. **Sialogogues.** Pilocarpine can stimulate salivary flow where some functional salivary tissue remains, particularly in drug-related xerostomia, but it commonly has unpleasant side effects such as increased sweating. The dry mouth may also be occasionally alleviated by sialogogues such as sugar-free chewing gum, glycerine or ascorbic acid, and lemon mouthwash.

Cleaning dentures it should be done for: Deposits form on dentures such as

- Microbial plaque
- Calculus
- Food debris.

These deposits may be responsible for a variety of problems including:

- Denture stomatitis
- Angular stomatitis
- Unpleasant tastes
- Odors
- Unsightly appearance
- Accelerated deterioration of some denture materials such as short-term soft lining materials.
- IPH-Inflammatory Papillary Hyperplasia. The effective cleaning of dentures is therefore of considerable importance to the patient's general well-being and oral health.

- Candidiasis and wearing ill-fitting dentures 24h/7 days are contributing factors. Resolve before making new dentures because, if left as it is, new dentures will be loose after placement, as inflammation resolves.

Treatment by:

1. Leave dentures out at night.
2. Reline with tissue conditioner.
3. Nystatin mouth rinse

In cases where an intractable dry mouth gives rise to a persistent problem of loose dentures a denture adhesive will usually provide some improvement in denture function.

Hard and soft materials for modifying the impression surface of dentures: Materials can be used to modify the impression surface to overcome some of these problems; these materials can either be applied by the dentist at the chairside or by the dental technician in the laboratory. The materials may be classified as follows:

1. Hard materials
2. short-term soft lining materials
3. long-term soft lining materials.

Hard materials Recent years have seen the development of a group of useful materials, frequently described as chair-side reline materials, which can be used to modify the impression surface of an existing denture. Commonly these materials consist of a powder containing polymethylmethacrylate together with a liquid monomer, butylmethacrylate. The important point to make is that monomeric methyl methacrylate, a tissue irritant, is avoided. Many of the products include a primer to enhance the adhesion of the material to the existing denture polymer. The available materials vary in working time, setting time, and viscosity. These materials can be useful for relining dentures. As they can be used at the chairside a ‘one-step’ reline technique can be employed.

Clinical applications: This has great benefits in the following situations:

- A laboratory reline would require the patient to be without any denture for an inconvenient length of time. (Patients have one set of dentures and socially unacceptable to be without dentures.
- A reline is required, but it is not necessary for it to last for much longer than a year. (The immediate denture patient is likely to fall into this category, as after a year the chairside reline will usually need replacing by a permanent rebase or by a replacement denture.
- Where a direct technique is indicated. (A chairside reline).

Clinical performance: Clinical trials have shown that the best of this group of materials are convenient to use and provide immediate improvement in fit and comfort. Over a period of time, there is a loss of material, especially at the borders of the denture; this loss is more apparent in the lower denture. However, the loss does not appear to cause marked deterioration of fit or comfort. The better materials should be regarded as having a working life of about one year. The surface can be cleaned in the normal manner and there is relatively little discoloration.

Short-term soft lining materials: are supplied in a powder/liquid form. An alternative presentation is in a ready-to-use sheet form which can be found in one product available to the dental profession and in several 'over the counter' products available directly to the general public. It is essential that traumatized tissue is examined by the dentist and that rational, rather than empirical, treatment is prescribed. The composition of the powder/liquid types is as follows:

- Powder. Polymethylmethacrylate, or copolymers of polyethyl/methylmethacrylate.
- Liquid. A mixture of
  a. an aromatic ester, such as dibutyl phthalate which acts as a plasticizer
  b. ethyl alcohol.

Clinical applications Short-term soft lining materials are placed in existing dentures for the following reasons

- Tissue conditioning. For tissue conditioning, the material is applied for a period of a few days to the impression surface of a denture when the mucosa is traumatized and inflamed. The tissue conditioner acts as a cushion absorbing the occlusal loads, improving their distribution to the supporting tissues and encouraging healing of the inflamed mucosa.
- Temporary soft reline. A short-term soft lining material can be used to improve the fit of a denture, typically an immediate restoration.
- Diagnosis. A short-term soft lining material can be used as a diagnostic aid when the dentist wishes to check the reaction of the patient and the tissues to an improvement in the fit of a denture.
- Functional impression. A short-term soft lining material can be used as a functional impression material applied to the impression surface of a denture for the purpose of securing an impression under functional stresses.
- Recording the neutral zone. The ability of these materials to be molded by the oral musculature over an extended period of several minutes allows them to be used to record the neutral zone

Long-term soft lining materials: Long-term soft lining materials distribute stress more evenly under dentures than do the hard denture base materials. They also absorb impacts that can arise from masticatory function. They can therefore be said to have a shock-absorbing or cushioning effect. As a consequence, it has been shown that the addition of a long-term soft lining to a complete lower denture improves the ability to bite and chew and provides a general improvement in comfort when compared with hard relines. The lining has also been shown to improve masticatory performance

Indications for use

1. Persistent pain under a denture.
2. Thin atrophic mucosa.
3. Parafunction. It is useful to consider the first three indications together, as a complaint of persistent pain may be due to the poor quality of the denture-bearing mucosa or to the patient's inability to regulate gripping or grinding habits. It is important to make two points; first, the problem is almost always found in the lower jaw and, second, it is essential to ensure that all existing denture faults have been eliminated before deciding to proceed with a long-term soft lining.
4. Replacing an existing denture that has a soft lining. Once a patient has successfully worn a lower denture with a soft lining and has gotten used to its 'feel' it is often wise to repeat the prescription. If this is not done and the new denture is made with a hard base the patient may have problems in adapting to it and reject the prosthesis as a result.
5. Sharp bony ridges or spicules. The pattern of resorption of the mandible may result in sharp ridges or spicules of bone on which the denture-bearing mucosa. The problem might be overcome, at least in the short term, by surgically smoothing the bone. However, there are often occasions where poor health or a strong preference by the patient to avoid surgery are contraindications to this approach. There is also the danger that surgical interference with the mandible will speed up the resorption of the bone. An alternative, conservative approach is to provide a soft lining, which often provides an acceptable level of comfort under these circumstances.
6. Superficially placed mental nerve. Another consequence of advanced resorption of the mandible is that the mental foramen and mental nerve may become superficially placed within the denture-bearing area so that the nerve is traumatized during function. This typically gives rise to a complaint of

severe, sharp, stabbing pain from the area of the mental foramen which is brought on by biting. A soft lining restricted to the problem area may provide relief. However, it is not uncommon to find that a superficial mental nerve requires greater pressure relief than can be provided by a soft lining. If this is the case it may be necessary to cut the denture away in the area of the nerve to eliminate pressure on the nerve altogether.

Types of long-term soft lining: Soft linings are made either of silicone rubber or soft acrylic. The silicone materials may be cold-curing or heat-curing. The soft acrylics are heat-curing; cold-curing soft acrylics have a very limited life span and are best thought of as temporary soft linings