RULES FOR PARTIAL DENTURE DESIGN

1. Keep it simple.
2. Support is the most important consideration.
3. Support then design retention.
4. Clasp tips retain not arms.
    a. Don't put rests and retention on lone mid arch teeth.
    b. Impression drag - tooth becomes narrower.
5. Beware of plunger cusps and anterior deep over bites.
6. Indirect retention is not required but can help.
7. Rest seats should be on the mesial of a tooth except bounded saddles.
8. Class 2 cavity preparations for rest seats are not required.
9. No rest seat preparation is often indicated.
10. Try to incorporate guide planes.
11. Posterior end of free end saddles must lie on Retro-molar pad.
    Act as bounded saddle.
12. After support, retention, then plan connectors.
    Lower - lingual plate are more accepted by patients than bars.
13. Mid palatal straps are troublesome.
14. Don't use posterior bars in deep palates - lift due to shrinkage (casting) food trap.
15. Check gingival margin areas on castings. Grind away if impinging on mucosa.
16. Don't send impression/cast to technician and let them design your patient's denture. You have seen the patient not them. You get back what you deserve.
17. Always draw your design on the cast you send to the technician even though you provide a prescription of design.
18. Don't call clasps by name i.e. Roach, I Clasp , T Clasp. Describe their action i.e. Gingival approaching arm with retention in the mesial undercut.
19. When there is anterior teeth to be replaced/added on a denture when there is a deep over bite or close bite. Set up a tooth of the right colour in the space so as the technician can put appropriate retention on casting to hold the tooth in place . If you don't do this you will get a casting back with the tooth retention in the wrong place. The resultant is a remake or a severely compromised upper anterior tooth which will be fractured off regularly and you will have to repair it.

GUIDELINES FOR PARTIAL DENTURE DESIGN

CONSIDERATIONS IN DETERMINING DESIGN

- Previous denture history and design.
- Aesthetic, functional and anatomical considerations - in relation to placement of design elements, e.g. clasps, rests, connectors.
- Patient education (oral hygiene, denture hygiene)
- Surveyed study models to provide path of insertion and maximization of desirable undercuts and minimization of undesirable undercuts.
- Design should be AS SIMPLE AS POSSIBLE consistent with adequate retention and functional requirements.
- Cover as little tooth and mucosa as is consistent with adequate load distribution and integral strength of the prosthesis.
- The natural occlusal integrity must be maintained while the denture/s is/are in place.

CHROME COBALT DENTURES

Denture Base Outline:

Tooth and/or tissue supported where possible, try to avoid free end saddles (Dental Extensions base or Shortened Dental Arch).

Support:

May be obtained by utilization of the following, where appropriate:

- Occlusal rests - need to be next to the edentulous space for bounded saddles, and away from the edentulous space for free-end saddles where the occlusion does not preclude it.
- Cingulum rests.
- Incisal rests - should be avoided - aesthetics, undesirable forces.
- Milled crown surfaces.

Retention:

- The property of a denture which resists the outward displacement of the denture, away from the tissues.
- Try to reduce the number of retainers consistent with adequate retention.

Indications for Choosing a Co-Cr Base R.P.D.

a. Where the patient is motivated and possesses an adequate standard of oral hygiene.
b. Where the remaining abutment teeth are of periodontally good prognosis.
c. Where, despite the patient's best efforts, good retention and comfort have not been achieved with an acrylic base R.P.D.

Less experienced clinicians may provide special types of R.P.D., such as overlay dentures within their level of skill and confidence. Seeking supervision and advice from more experienced and expert clinical staff is highly recommended to avoid mishaps and ensure success and excellent prognosis.

Avoid unnecessary remaking of R.P.D

Finally unnecessary remaking of a new R.P.D. may be avoided by using one or more of the following procedures on the existing denture:

1. Adjustment;
2. Repair;
3. Reline;
4. Rebase.

Patients with an unstable dentition

Where patients require extensive stabilization due to a high caries rate and/or periodontal disease, removable partial dentures should be prescribed cautiously. A R.P.D. should only be included as part of such a patient's initial course of cares where there is an essential clinical need and where delay in such treatment would compromise the patient's well being.

In assessing **essential clinical need** for removable prosthodontic care, the following criteria should be employed:

1. Patient requires replacement of existing denture which is excessively worn or aged, and of poor fit, so that associated trauma exists.

2. Patient requires repair/reline to existing denture to make the denture wearable or to eliminate associated trauma.

3. Patient has recent loss of anterior teeth and demonstrates concern for being without the teeth.

4. Patient has loss of posterior support with associated TMJ symptoms.

5. Patient is medically compromised and a denture is deemed essential to the patient's health.

INDICATIONS FOR TREATMENT PLANNING OF REMOVABLE PARTIAL DENTURES IN SWAHS

Clinicians must be aware of the fact that issuing patients with any form of removable prosthodontic appliance, which includes removable partial dentures (R.P.D.), is a costly exercise involving expenditure of materials, labour and time. Further, because resources are limited, case selection must be judicious and the treatment planning detailed and accurate.

Many R.P.D.s issued in the past have been unsuccessful. The reasons for this are many and varied and some of the most important are:

a. Inappropriate case selection (R.P.D. not indicated).
b. General lack of motivation/responsibility to accept and adapt to a R.P.D. by the patient.
c. Inappropriate design.
d. The inadequacy of mouth preparation, and/or of the patient's oral hygiene.
e. Denture painful in use or aesthetics not acceptable.

It is in the interest of the patient and clinical and technical staff to ensure that every R.P.D. be fabricated with clinical success in mind.

The clinician should explore **the reasons for a patient requiring a partial denture** which may be:

a. To improve aesthetics.
b. To improve masticatory efficiency.
c. To stabilize the dentition.

Following consideration of these important factors, the clinician and patient will be able to determine:

a. Whether to make an R.P.D. at all.
b. The type of R.P.D. to make.
c. The edentulous areas to be restored. (The restoration of small posterior saddle areas is rarely justified, e.g. only 6 is missing). The shortened dental arch, i.e. 5 to 5 is present, is not an indication for R.P.D. construction.

Indications for choosing an Acrylic Base R.P.D. are:

a. Where the prognosis for the remaining teeth is questionable. This could include the following situations:
    - the oral hygiene is inadequate
    - periodontal pathology is advanced
    - few teeth remain.

b. Where immediate R P.D. is indicated

c. When the denture is used as an intermediate or provisional prosthesis to manage aesthetic and functional occlusal demands whilst complex restorative treatment is being carried out.

RETENTION

Direct

- circumferential mostly associated with bounded saddles.
- roach/gingivally approaching - free end saddles.

Indirect

- associated with one or more free end saddles.
- use of other components of the denture - eg. rests, denture base, clasps.
- utilization of fulcrum line.

Guide Planes

- define or limit the path of insertion
- frictional effects
- efficiency depends on number and length

RECIPRICATION

- All retainer tips need to be reciprocated
- Use of Rigid arm or Denture base (cast or acrylic)

CONNECTORS

All major connectors must be rigid. eg.

- Lingual Bar
- Lingual Plate
- Palatal Bar - anterior and/or posterior
- Horseshoe

TOOTH PREPARATION

The amount of tooth preparation should be consistent with adequate strength of the elements involved, e.g. occlusal rests, minor connectors.

Acrylic Dentures

Usually provided where:

- Prognosis for rernaining teeth is questionable
- Denture will be mainly tissue supported
- Oral hygiene is inadequate

Denture Base - proper extensions provided by adequately muscle trimmed impression.
Support - occlusal rests - use of 1/2 round wire require associated generous tooth preparation.
Retention - wrought retainers - shaped and tapering.

DIAGNOSIS AND TREATMENT OF FULL DENTURE COMPLAINTS

There are four main essentials for the efficient function of Full Dentures:

1. **SUPPORT** is the foundation on which the denture rests. It consists of the tissues which bear the weight of mastication.

2. **RETENTION** is the resistance of the denture to removal from the mouth.

3. **MUSCULAR BALANCE** implies that the muscular forces of the tongue, lips, and check act on the denture in such a way that the denture is not dislodged during functional movements of the mouth with the teeth out of contact.

4. **OCCLUSAL BALANCE** implies that the forces exerted by one denture on the other act in such a way that the denture is not dislodged during functional movements with the teeth in contact.

Thus we can classify the problems associated with edentulous cases into the following groups. Nearly every problem associated with a particular denture patient represents a combination of problems in two or more of the following groups. It is important to diagnose and correct each component so that at the end of the procedure the patient is satisfied with the result.

SUPPORT PROBLEMS

A denture complaint is likely to be connected with support if:

a. Firm pressure on the denture -bearing area elicits pain.
b. The patient has pain when they clench their dentures in centric occlusion. (Provided the centric occlusion has been found to be correct).
c. Alternate pressure antero-posteriorly and from side to side shows rocking of denture bases which appear to be closely adapted to the tissues.
d. The patient complains of pain or has a "Burning" feeling in the denture - bearing area and there is no sign of ulceration.
e. The ridges are narrow or the mucosa is soft and flabby.

ALWAYS USE DISCLOSING PASTE TO FIND THESE PROBLEMS AS RANDOM ADJUSTMENTS CAN LEAD TO OTHER PROBLEMS.

RETENTION PROBLEMS

A denture complaint is likely to be connected with retention if:

a. The denture can be easily removed from the mouth without apparent resistance.
b. When the dentures are seated by firm digital pressure they soon drop out as soon as the finger is removed.
c. The patient complains of denture looseness even when the facial musculature is at rest and they are not eating or speaking.

MUSCULAR IMBALANCE PROBLEMS

A denture complaint is likely to be connected with muscular imbalance if:

a. The patient feels they have a "mouthful" and have difficulty in speaking as well as eating. (Too little tongue space)
b. The lower denture rises when tongue is protruded (lingual flange is too deep) or when the mouth is opened widely. (buccal flange too long).
c. The denture resists removal from the mouth but drops when the patient yawns or laughs.
d. The patient has no pain 'but can't bear the dentures' and takes them out at every opportunity. (This can be also associated with support problems).
e. The tongue becomes sore at the front and there are no rough spots on the denture to account for this. (Too little tongue space).
f. The upper teeth are set on the ridges in a case where there is much resorption of the alveolar ridge.
g. There are any undercuts on the polished surface of the lingual flange of the lower denture.
h. The dentures do not restore the lips and cheeks to their normal position.
i. The polished surfaces of the denture do not present surfaces which the cheek, lips, and tongue muscles can act against to keep the denture in place.

OCCLUSAL BALANCE PROBLEMS

A denture complaint is likely to be connected with occlusal imbalance if:

a. The patient can wear the dentures comfortably between meals but has to remove them during meals because they move and cause them pain.
b. The denture becomes loose only after occlusal contact.
c. The denture is firm for the first few hours of the day and then becomes loose and the patient finds a white mucus layer on the fitting surface of the denture which becomes firrn when the mucus is washed off. (Too heavy an occlusal contact anteriorly or premature incisal contact on protrusion).
d. The patient tends to retch when they occlude their teeth but not at other times.
e. There is pain with ulceration of the mucosa but no bbvious blebs on the fitting surface to account for the ulcers.
f. The dentures click. (Wrong bite height and occlusal imbalance)
g. The patient complains of a feeling of tenderness of the masticatory muscles (Bite too high)
h. The dentures move during grinding.

AESTHETIC PROBLEMS

These are likely to be self diagnosing. Watch for the patient who attends for many adjustment appointments where you can find nothing wrong. Sometimes the patient hopes the aesthetics will be changed but they will not tell you as they feel guilty as they had approved the set up, Sometimes the patient is happy but the family or friends are not.

MISCELLANEOUS AND PSYCHOLOGICAL

a. Retching is basically a psychological problem and should be treated by therapies to extinguish reflex reactions.
b. Acrylic sensitivity, a very rare condition which can be diagnosed with patch tests. Often can be mixed up with "Burning mouth syndrome", "Denture sore mouth" and "Candidal infection". Appropriate testing can separate them.