

2nd Ed.

ORAL DIAGNOSIS AND TREATMENT PLANNING
MANUAL

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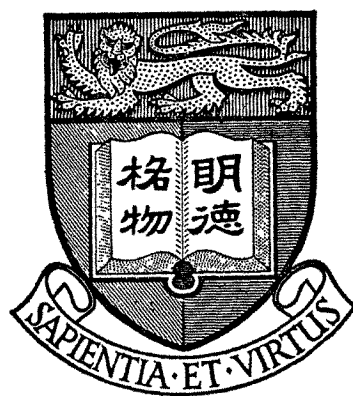
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INTRODUCTION

The dentist serves not only his individual patients but also the community of which both he and his patients are a part. His responsibilities for the one should extend to awareness and activity in relation to the other. Indeed, it is not possible to care properly for the individual without paying regard to the environment in which he lives.

To the individual patient the Oral Diagnosis and Treatment Planning Clinic offers: a careful evaluation of his dental health; such treatment and training as is necessary to eliminate or control active and progressive oral disease; the educational foundations upon which the prevention of oral disease may be built; and a carefully prepared plan for his future dental health.

In this clinic the student is given the opportunity to participate in the care of a large number of patients. He is enabled through these contacts to develop a critical appreciation of a patient's needs. He will gain experience in a range of investigations; in the stabilization of oral disease; in dental health education; in making decisions by planning dental care; in the cost of dental care; and in the pattern and prevention of dental disease on both a personal and a community level.

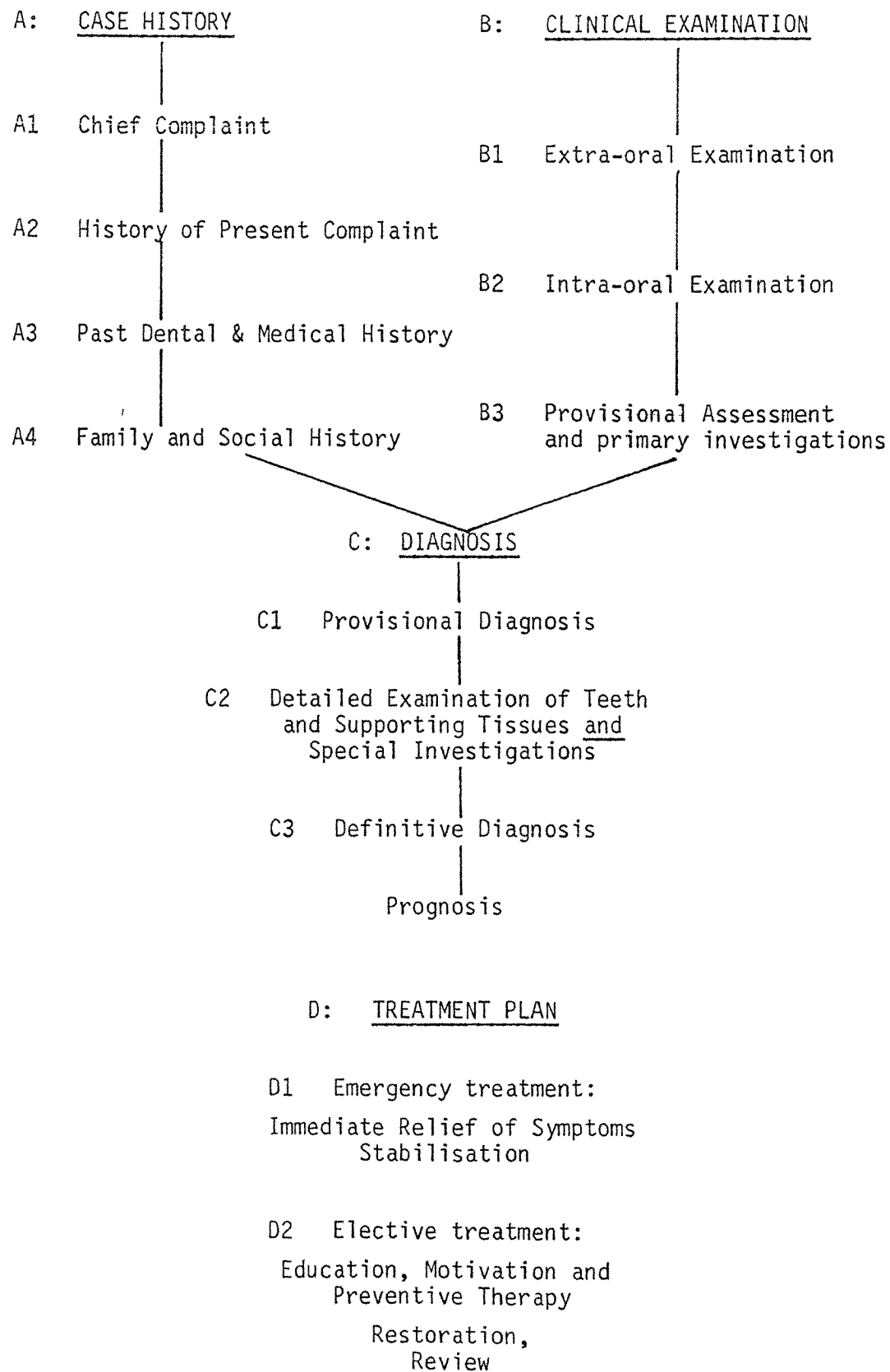
Dental care may be divided into two phases; Primary or Emergency Care for the relief of pain or other distressing symptoms (essentially short-term treatment with this limited objective), and Elective Care which is aimed at establishing and maintaining a mouth of optimal function consistent with the wishes and potential responses of the patient. In other words, elective dental care is concerned with the elimination or control of disease, the repair of damage when possible and the prevention of further disease.

To achieve this aim and to consolidate for many years any improvements obtained it is necessary to be conversant with all aspects of the patient's dental problems. No single plan of investigation can give the emphasis required for different patients with their differing problems. The experienced clinician may appear to seize upon the crux of a problem with minimal attention to peripheral detail. This may lead the student to emulate the performance by guess-work and snap diagnosis. Facility with diagnosis and treatment planning must be gained by practice in the consideration of all details. Although at first the paths may appear to be numerous and the routine cumbersome, it later becomes possible to reject those enquiries and investigations irrelevant to the patient under consideration.

Successful dental treatment depends upon correct diagnosis and treatment planning, especially when patients present with several problems. The treatment plan lays down the objectives thought to be attainable and the order in which the various steps are to be carried out. However, continuing assessment of the response of the patient to treatment and instruction may indicate that modifications are required if treatment goals are to remain realistic.

The student's group teacher in ODTP will guide him through the necessary stages which culminate in a definitive treatment plan. In many cases further consultation will not prove necessary but in those circumstances where the group teacher considers that it would be valuable for the student to have another opinion, on a specific aspect of a patient's dental problems, the student's group teacher in the appropriate discipline will be consulted. In this way the student and the patient will reap the benefit of both the generalist and specialist approach.

SUMMARY OF THE SEQUENCE OF ORAL
DIAGNOSIS AND TREATMENT PLANNING



PATIENT ASSESSMENT

Rational treatment planning for a patient requires that first, a diagnosis is made. By "Diagnosis" is meant the identification of a disease process by an investigation of the history and symptoms of the process. Symptoms are manifestations of disease and are commonly considered under two headings.

- (a) subjective symptoms which are those discerned by the patient,
- (b) objective symptoms (or signs) which are those which produce functional and structural changes that may be discerned by the patient or the examiner.

Logically, therefore, the initial process of diagnosis falls into two parts

- (i) an investigation of subjective symptoms by patient interview - the CASE HISTORY.
- (ii) the identification of objective symptoms by CLINICAL EXAMINATION of the patient.

A: THE CASE HISTORY

History taking is probably one of the most important parts of patient assessment. Yet its purpose is frequently misunderstood and undervalued. It should be considered as the foundation of intelligent diagnosis and indeed to attempt to formulate a diagnosis without efficiently utilising the patients' knowledge of the disease affecting them is akin to the proverbial ship without a rudder. Frequently, a diagnosis appears self-evident by inspection alone. However, without an adequate case-history the following are easily overlooked:

1. coexistent disease may go undetected unless the patient is allowed to express his complaints.
2. a diagnosis, though seemingly obvious, may in reality be masking a serious and extensive disease.
3. assessment of patient attitudes and the establishment of good patient/clinician relations are disregarded.

A clear understanding of the objectives of the case history will enable the clinician to:

1. arrive at a tentative diagnosis of the patients' chief complaint.
2. determine any systemic factor which might influence this diagnosis.

3. determine any systemic condition which may require special precautions before and during dental procedures.
4. compile a written record that will serve as legal evidence of professional competence.

The basic method for history taking is that of the direct patient interview. During the interview the clinician questions the patient in an orderly fashion, following a basic pattern of questions. He should not lead the patient, but must keep the patient to the subject at hand. He makes notes during the interview and compiles the important information afterwards. He should act as a strong yet sympathetic chairman ready to allow the airing of relevant information but equally as ready to keep the meeting to the matter under discussion. He should not, however, override the opinions of others simply because they do not concur with his own.

Plan of History Taking

A case history should be brief and concise, and yet still contain all of the information required by a given situation. Relevant facts should not be concealed amongst a wealth of irrelevant information, such a practice is time-consuming and frequently misleading. An adequate history can consist of a few questions only but this ability to record a brief yet accurate history requires considerable clinical experience, and a knowledge of how extensive a history should be for any given occasion. There is no short cut to this knowledge and for the inexperienced historian the use of a uniform procedure will ensure the inclusion of all the relevant information.

It is sensible to begin by first considering the patient's complaint for it is this that, in the first place, prompted him to seek professional advice, and it is this that will be of most immediate concern to the patient.

A1 CHIEF COMPLAINT (c/o) or reason for attendance

The chief complaint is a symptom or symptoms described by the patient in his own words which relates to the presence of an abnormal condition. It is frequently given in answer to the question "What prompted you to seek dental treatment?" or "What can I do for you?" It is not necessarily answered by the question "Why did you come to the dental clinic?" Such questions may be answered by "I want a check-up, bridge etc." or "My Aunt Lily recommended you". These are not symptoms. There is usually a reason why the patient feels he needs a check-up or a bridge. Symptoms are a clear expression of the patients' problem. It is quite possible that the patient has no chief complaint. Such information is significant and should be recorded.

A2 HISTORY OF PRESENT COMPLAINT (HPC)

A chronological account of the chief complaint and associated symptoms from the time of onset to the time the history is taken.

It begins with a brief account of the chief complaint, its onset, time of onset, character, location, relation to other activities and association with other symptoms if any. Each symptom is then expanded by direct inquiry concerning its development and relation to other symptoms. Negative as well as positive symptoms should be recorded. Eg. a tooth that originally reacts to cold, then to heat and then to neither is suggestive of pulpal necrosis.

If the complaint is in the form of a pain, much care must be taken to extract all the information available and yet avoid leading the patient. If suggestions are made they must always provide a range of possibilities from which the patient may select. The following list will provide a guide to the information required regarding a pain:

- Commencement: Did the pain commence hours, days or weeks ago, and can it be related to any incident, such as a blow, or even a visit to the dentist.
- Location: Patients may be able to locate the source of the pain with some accuracy, e.g. with an apical periodontitis, but if the pain is pulpal in origin, its location may be both vague and inaccurate. Any variation in the symptoms should be noted.
- Type: The nature of the pain may provide an indication of its cause, though descriptions will often have to be suggested, e.g. sharp, dull, throbbing, burning, aching, etc. Note any change in its character and whether it is improving or getting worse.
- Incidence: Ascertain the frequency of pain.
- Duration: Note if the pain lasts seconds or minutes.
- Time: The pain may be present at the time of examination, or it may be found to occur at a particular time of the day (on rising in the morning, at night).
- Stimulation: Pain may be spontaneous or brought on by certain stimuli or both; eating, biting, sweet or spicy foods, temperature change, either heat or cold, lying or bending down, wearing of dentures.
- Amelioration: The pain may be relieved by biting on a particular tooth and then relaxing, by hot or cold mouth wash, or by the action of a drug. If so, how quickly and for how long?
- Other Complaints: A patient can often provide information regarding symptoms which, however, are not uppermost in his mind, e.g. sensitivity (to heat, cold, sweetness) food packing, bleeding gums, pain or clicking of the temporo-mandibular joint (T.M.J.), discomfort from or inadequacy of appliances.

A3 PAST HISTORY

Through relevant inquiry, an assessment is made of the patient's dental and medical well being up to the time of examination.

(i) Past Dental History (P.D.H.)

This can often provide the clinician with useful information of diagnostic and prognostic value. Further, insight into patient attitudes to dentistry is often possible. The clinician must, however, be aware that the patient is presenting only his side of the story. Patients dissatisfied with past dental treatment can often give a distorted history which would suggest that they have been victim to a series of incompetent and uncaring dentists when in reality it is they themselves that have been indifferent and neglectful toward their dental health. Regretfully their assessment of other practitioners' competence can occasionally be accurate, though this should NEVER be voiced to the patient.

The past Dental History should include information regarding:

<u>Visits to the dentist:</u>	How long since the patient visited the dentist, what were the reasons, and how frequent were the visits? How many dentists has the patient previously consulted?
<u>Dental Treatment received:</u>	what type of dental treatment has been received in the past (emergency or routine) and what was the patient's experience.
<u>Dental Treatment:</u>	Is the patient undergoing any type of treatment at present, what for any why?
<u>Reasons for loss of teeth:</u>	e.g. was it because the patient refused 'fillings', etc. Obtain dates of tooth loss if possible.
<u>Attitude to dental treatment:</u>	i.e. to what extent is the patient willing and in a position to sacrifice time and to subject himself to dental treatment.
<u>Advice received on preventive dentistry:</u>	Oral hygiene, habits; type of toothpaste used, dietary advice.
<u>Fluoride Application:</u>	Has topical fluoride been used, tablets taken, toothpaste used.

Name of Patient

Date 日期	MEDICAL HISTORY 病 歷
	<p>DRUGS 藥名</p>

This questionnaire is to be completed by the clinician and NOT by the patient or a D.S.A.

When dealing with children the question should be prefixed by "is or has your child" or "has he/she . . .?"

此問卷須由牙醫填寫，而並非由病人或牙科助手填寫。如對象是兒童時，問題前則須加問「你的孩子是否或曾否」或「他/她有沒有……。」

Yes No
是 否

- | | | | |
|--|----|--|--|
| 1. Are you in poor general health?
閣下之健康是否不良? | 1 | | |
| 2. Are you receiving medical treatment from your doctor, hospital or clinic?
閣下是否正在接受醫藥治療? | 2 | | |
| 3. Are you taking any medicine, pills or tablets either from your doctor or of your own accord?
閣下現在是否服食任何藥物? | 3 | | |
| 4. Have you attended a hospital previously as an in-patient or out-patient?
閣下曾否入住醫院或在醫院「門診部」接受治療? | 4 | | |
| 5. Have you ever had a general anaesthetic?
閣下曾否接受「全身麻醉」? | 5 | | |
| 6. Are you allergic to penicillin or any other medicine, food or substance?
閣下是否對「盤尼西林」、食物或其他藥物有「敏感」? | 6 | | |
| 7. Do you suffer from hay fever, eczema or asthma?
閣下曾否患「乾草熱」、「濕疹」或「哮喘」? | 7 | | |
| 8. Have you ever had rheumatic fever?
閣下是否曾患「風濕性熱病」? | 8 | | |
| 9. Have you ever had abnormal bleeding after extractions, surgery or injury?
閣下施手術、脫牙或受傷時是否流血不止? | 9 | | |
| 10. Have you undergone steroid, anti-coagulant or irradiation therapy?
閣下曾否服用「類固醇」、「抗凝血藥物」或「電療」? | 10 | | |
| 11. Have you ever suffered from jaundice, hepatitis or other liver disease?
閣下是否曾患「黃膽病」、「肝炎」或其他「肝病」? | 11 | | |
| 12. Do you have sudden fainting attacks or giddiness?
閣下曾否突然暈倒或常覺頭暈? | 12 | | |
| 13. Have you had any childhood diseases?
閣下兒時曾否患「水痘」、「麻疹」、「疥癬」等症? | 13 | | |
| 14. Are you an expectant mother?
閣下是否懷孕? | 14 | | |
| 15. Have you suffered from any of the following illnesses?
請閣下指出曾否患下列疾病： | 15 | | |

- | | | |
|---|--|---|
| Heart Disease <input type="checkbox"/>
心臟病 | Kidney Disease <input type="checkbox"/>
腎病 | Tuberculosis <input type="checkbox"/>
結核病 (肺癆) |
| Hypertension <input type="checkbox"/>
高血壓 | Diabetes <input type="checkbox"/>
糖尿病 | Epilepsy <input type="checkbox"/>
癲癇 |
| Blood Disease <input type="checkbox"/>
血病 | Thyroid Disease <input type="checkbox"/>
甲狀腺病 | Stroke <input type="checkbox"/>
腦克血 |

16. Is there any other medical information about which we should know?

請述其他有關健康資料。

Positive answers to any of the above questions indicate the necessity for further enquiry and this may be written up overleaf.

以上有正面答案之問題，必須加以詳詢，並將答案列在下頁。

(ii) Past Medical History (P.M.H.)

Many procedures carried out in dental practice and many drugs prescribed in dentistry are potentially fatal to certain patients. A deterioration in a patient's health as a result of dental treatment is both morally and legally unacceptable. It is the important responsibility of the dentist to identify those patients at risk, and this is the objective of the medical history.

As with all history taking, questioning should be careful and systematic so as to ensure success. Many systems are available but in this hospital, the preliminary assessment is made by use of a questionnaire and there are good practical and legal reasons for so doing. However, the word preliminary should be emphasised. Further inquiry should be made about any positive answers. The questionnaire should be completed by the clinician and NOT by the patient or a D.S.A. Quite serious disease can sometimes be neglected by the patient and it is not the responsibility of a D.S.A. to determine the possible relevance of the medical history to dental treatment. That responsibility must rest with the clinician.

The student is referred to Appendix 1 for a more detailed consideration of the particular illnesses and treatments that may have a direct bearing on the type and scope of dental treatment that is offered the patient.

A4 FAMILY AND SOCIAL HISTORY: Whilst it is never the right of the practitioner to pry into the family and social background of his patients, information relevant to diagnosis and treatment planning can be obtained by a discreet and polite inquiry. One has in mind particularly, information as to possible hereditary and infective illnesses, and the problems imposed by various social and economic factors on the patients ability to accept treatment or modify their behaviour.

Relatives: particularly illnesses in parents, siblings, children.

Social relationships: type of work; in the case of children, are the parents working, what type of accommodation do they live in?

Hereditary conditions: is there any knowledge of any such conditions (e.g. bleeding, diabetes)? Negative must also be recorded.

Congenital defects

Educational Attainment Form 4 or 5, Matriculation etc.

HABITS

These may be graded as 'Good', 'Bad' or 'Acceptable'. The following are some examples.

Oral hygiene:

to what extent is this practised, what form does it take, what are the patient's toothbrushing habits?

Bruxing, clenching or grinding:

Is the patient (or a relative) aware of habitual grinding of the teeth either at times of stress or during sleep?

Thumb sucking, etc.SmokingDiet:Past dietary habits:

In the case of CHILDREN were they breast or bottle fed; was there any difficulty, what type of milk, etc. Have they lived in areas with high or low fluoride content in the water supply?

Present dietary habits:Type/Nature of Diet:

what are the relevant constituents, in what form is the food taken?

Routine:

e.g. is a meal concluded with 'confectionery' or 'fruit'; are between meal snacks habitual?

B: THE CLINICAL EXAMINATION

The urge to pick up a probe and immediately force it into every part of the mouth must be resisted for much information which might otherwise be missed can be obtained simply by looking, both at the patient and the mouth as a whole. It is important to learn to appreciate that there is a 'range of normal' for each patient, a range that is learned by experience.

Plan of Clinical Examination

As with the case history, this should follow a logical and ordered sequence. This will take the examiner from a general appraisal of the patient as a whole, through a more detailed extra-oral examination of the head and neck to a careful examination of the intra-oral tissues which will end with a detailed examination of the teeth and supporting tissues.

The general appraisal of the patient will, in truth, have begun as soon as the examiner sees the patient, noting such features as build, mobility, alertness, psyche and general hygiene. Such observations should continue throughout interview and examination.

The object of the clinical examination is to elicit physical signs of disease. These may be seen (inspection) as with change in colour, size and shape, they may be felt (palpation) by the examiner as when assessing the size, shape and textures of swellings. The technique of percussion is frequently of use, being of particular value in the assessment and localization of apical periodontitis and acute periodontal abscess by noting the patient's reaction to light tapping of the teeth with the handle of a probe. More rarely, signs of disease may be heard (auscultation) e.g. temporomandibular joint sounds, or even smelt (purulent discharge). Wherever possible comparison should be made between diseased and apparently normal tissue; this is of particular importance in the assessment of swellings. At all times, the possibility for normal variation should be kept in mind.

B1 EXTRA ORAL EXAMINATION

(a) Overall appraisal of the patient:

Stature and size in the case of children, their weight and height are recorded. How tall in relation to others in same class.

General appearance of vigour and health

Demeanour

Hands - smoking, finger habits, chewed nails, osteo arthritis, rheumatoid arthritis.

(b) Head and neck:

Facial asymmetry; shape of head

Swellings

<u>Lymph nodes:</u>	Note any enlargements
<u>Frankfurt/Mandibular plane angle:</u>	Estimate whether "average" (24° - 32°), high or low.
<u>Skeletal classifications:</u>	1, 2 or 3.
<u>Temporo-mandibular joint (T.M.J.)</u>	Note any abnormal or excessive movement, discomfort on palpation, or clicking. Is there an abnormal habitual posture present?

B2 PRIMARY INTRA ORAL EXAMINATIONOcclusion and Function

It is important that the mouth be considered as a single functioning organ and not only as a collection of different tissues and structures.

<u>Lips:</u>	Their <u>Form</u> , competent or incompetent, their <u>Activity</u> , together, apart? separated by upper anterior teeth, closed up line related to central incisors, lip contraction on swallowing.
<u>Swallow:</u>	Teeth together, teeth apart, anterior or lateral tongue thrust, endogenous tongue thrust?
<u>Teeth:</u>	Teeth present or absent; their function or lack of function. Their form, particularly marginal ridge relationships, and their appearance. Abnormal wear and facets may have to be related to mandibular movements, parafunctional activities and also to tooth mobility patterns which may require subsequent analysis.
<u>Arch and Palate Form:</u>	General and any abnormality.
<u>Arch Relationship:</u>	Overbite and overjet. Molar cross bite. Angle's classification of malocclusion.
<u>Centre Lines:</u>	Of both arches in relation to the face with mouth closed and open.
<u>Tooth Alignment:</u>	The presence of crowding or spacing, displacement or rotation in both arches, in the labial or the buccal segments. Angulation of the upper and lower canines and incisors. Effectiveness of the contact points, and the possibility of premature contacts.

Appliances: Occlusal relationship, stability in occlusion, relationship of soft tissue, whether worn at night, their value in function.

Soft tissues of the mouth

Lips:(including oral parts) Their appearance, colour, fissures, ulceration, patches, presence of angular cheilitis?

Tongue: Its mobility, and size, the state of the epithelium, the papillae, the presence of any swelling?

Sublingual: Swellings, ulceration?

Cheeks: Swellings, ulceration?

Palate Hard and soft - any abnormality?

Edentulous Alveolar Ridges: Note the degree of resorption.

Oropharynx: tonsils

B3 PROVISIONAL ASSESSMENT AND PRIMARY INVESTIGATIONS

Periodontium: (Preliminary assessment):

At this stage, a general appraisal of the periodontium should be made. The findings of this are to be recorded in words under the following headings:

- the appearance of the gingiva and its tendency to bleed.
- loss of attachment in terms of recession and probing depths.
- calculus: amount, distribution and type.
- plaque: amount and distribution.

(On occasions, the general appraisal of the periodontium reveals large deposits of calculus, which would prevent the performance of an adequate clinical examination of both the periodontal tissues and the teeth themselves. It is then necessary to perform some preliminary scaling to remove extensive deposits of calculus, as a prelude to the secondary intra-oral examination.)

Dental Caries (preliminary assessment):

What is the caries experience of the patient in terms of past experience (restorations, extractions due to caries) and present experience (existing lesions)? How extensive and of what type are the lesions present? (rapidly progressing soft and yellow coloured as opposed to hard, brown and slowly progressing or arrested). What sites are affected: occlusal, approximal, cervical? (remember that only large approximal lesions can be diagnosed without radiographs where the teeth are in contact).

Primary Investigations

To facilitate further examination of the patient and to provide information required to supplement visual observation, certain investigations may be necessary at this stage.

Medical

e.g. haematological, urine etc. as indicated: e.g. for anaemia, hepatitis or diabetes.

Radiographs

The following radiographs will be required for the majority of patients as an aid to diagnosis and treatment planning. There are a number of other radiographic views that may then be required to provide more detailed information (Appendix 2)

Panelipse

This provides a panoramic view of the teeth and jaws in a single exposure. For screening purposes it should not be necessary to repeat this view more than once a year in adolescents or more than once every three years in adults. This view is not suitable for small children. Information regarding the following may be obtained:-

- (a) the presence or absence of teeth in the permanent dentition, and position of unerupted teeth.
- (b) the alveolar support of the teeth.
- (c) root morphology, and relation to adjacent anatomical structures.
- (d) pathological conditions affecting the teeth and jaws.

Bite-wing radiographs :

demonstrate the crowns of upper and lower cheek teeth of one side on a single film. They may be repeated at intervals of not less than six months for screening purposes. Comparison of serial films allows the activity of small approximal lesions to be monitored. Information regarding the following may be obtained:

- (a) the presence and extent of approximal carious lesions.
- (b) the level of the interdental alveolar crests.
- (c) deficiencies and excesses of existing restorations. (including recurrent caries).
- (d) the presence of calculus.
- (e) the morphology of the coronal pulp chamber.

C DIAGNOSIS

C1 PROVISIONAL DIAGNOSIS(ES)

Having completed the case history and examination of the patient, the examiner should now collate these findings and make a provisional diagnosis. Often examination will have confirmed the tentative diagnosis made after interviewing the patient. As frequently, both interview and examination will have revealed other disease processes Oral diagnosis is, in fact, seldom concerned with the identification of a single disease process in the mouth. Rather, it is a statement of circumstances of oral and possibly systemic importance that require recognition, management or treatment.

In order to confirm or deny this provisional diagnosis it is now necessary to perform a detailed examination of the teeth and supporting tissues and where necessary to carry out further special investigations.

C2 DETAILED EXAMINATION OF THE TEETH AND SUPPORTING STRUCTURES

(i) Caries

A detailed examination of all carious lesions is now made using direct clinical examination supplemented by adequate bitewing radiographs, all findings are recorded on the Dental Chart (See Appendix 3).

Accurate reproducible diagnosis of carious lesions is a notoriously difficult task, many experienced clinicians will disagree as to the number of lesions present in a particular mouth and as to which should receive particular forms of treatment.

Attempts should therefore be made to achieve a consistent standard by ensuring optimal examining conditions: that is adequate control of saliva, lighting, removal of debris, the proper use of probes and a systematic method.

Having diagnosed a carious lesion three main lines of action are available: (1) chart the lesion and keep it under periodic review to ensure that it does not progress (no restoration).

(2) chart the lesion, treat preventively with fluoride and then keep under periodic review (no restoration).

(3) chart the lesion and restore it.

Choices (i) and (2) are made when a lesion is small in size and appears arrested, remineralized, or unlikely to progress, and at the stage when dentinal involvement is minimal. Option (3) is appropriate for active,

progressing lesions where dentine is definitely involved and tooth destruction is continuing. This last choice is not the automatic treatment given to all carious lesions in a community such as Hong Kong where racial and dietary factors combined with long term water fluoridation result in the majority of the population having a low caries prevalence (few lesions) and a low caries incidence (few new lesions). Some 'high risk' patients however deviate from the 'norm' in having more, more active lesions and their treatment plans must be altered accordingly.

When should carious teeth be restored?

From the above it can be seen that separate decisions are needed for each and every patient but the following should be regarded as general guidelines.

Occlusal caries: the "sticky fissure" (those fissures which grip the tip of a probe so that resistance is felt when removing it) is an unreliable sign taken in isolation. Diagnosis should be made by both visual and tactile examination, the probe being used to clean out debris from the fissure to aid the diagnosis. Stained dark fissures which 'catch' the probe but do not have a soft dentine floor, and for which no evidence of occlusal dentinal radiolucency can be seen on the bitewing radiographs, should not be restored immediately but reviewed. Topical fluoride application may be considered. In the presence of a softened dentine floor, or where there is definite cavitation, or radiographic evidence of dentinal involvement a restoration should be planned.

'Free' smooth surfaces (buccal, lingual and root surface lesions) Differential diagnosis of caries from hypoplasias, fluorosis and staining must be made. Avoid heavy pressure with sharp probes which may precipitate cavitation of lesions with intact surface layers. Lesions with intact surfaces and those with small hard cleansable defects should not be immediately restored but should receive fluoride.

Active lesions with soft dentine floors, or large defects which are difficult to clean should be restored.

Approximal Surfaces: (a) Posterior If on the bitewing radiograph a radiolucency penetrating less than $\frac{1}{2}$ way through the enamel cap is visible - no restorative treatment is required: Review. If the lesion extends more than $\frac{1}{2}$ way through the enamel cap but does not extend through the amelodentinal junction into the dentine no immediate restorative treatment is required; consider fluoride treatment. If the lesion extends through the A.D.J. and into the dentine restorative treatment is indicated.

Clinical and radiographic examinations should always be correlated; beware of false positive radiographic diagnosis due to hypoplastic defects or fractured marginal ridges.

- (b) Anterior: transilluminate with mirror or fibre optic light. Only restore if dentinal involvement or true cavitation likely.

The choice of time interval for review of small lesions is a difficult and individual decision which should be made for each patient after considering what intervals are appropriate for maintaining patient motivation in oral hygiene and for periodontal re-assessment. For adult patients 12 month recall intervals are often appropriate for reviewing caries status.

- (ii) Periodontium a detailed examination of the supporting tissues is now made (see Appendix 3).

Special Investigations

It is often necessary to carry out further special investigations.

(a) Vitality Tests

The vitality of a tooth pulp may be suspect from the history, its appearance (discolouration, fracture, caries), or from its radiographic appearance. Completely pulpless teeth can often be recognised. but an accurate assessment of the pulp's condition is more difficult. The patient's reactions to the following tests usually prove to be of considerable help. The tooth to be tested should be carefully isolated.

Cold: A small cotton wool pledget soaked in ethyl chloride is a convenient means of stimulating individual teeth by cooling them.

Heat: Hot water on cotton wool may evoke a reaction but usually a hot round burnisher with or without gutta percha is more effective.

Electricity: The Electric Pulp Tester is a useful but not an absolute guide. Results should be recorded: on row 4 of the dental chart. (See Appendix 4).

Cavity: If the vitality of a tooth pulp cannot be determined in any other way a small test cavity may be cut.

b) Extensive Carious Lesions

Such lesions may require investigation by the excavation of caries. Although this is in part treatment, it is carried out at this stage essentially to obtain information and care must be taken not to become involved in an extensive restoration at this juncture. Clear decisions should be made and recorded concerning:

The condition of the pulp and the treatment it requires.

The prognosis for the tooth if restored.

The treatment required, whether extraction, endodontics, or some stated form of restoration.

(c) Diet Analysis

For certain patients an analysis of their diet is advisable, e.g. those suffering from rampant caries, extensive cervical caries or caries on unusual surfaces.

(d) Biopsy

In the diagnosis, or confirmation of diagnosis, of some pathological conditions a biopsy is sometimes necessary.

(e) Study Casts

Study casts should be available for many cases, but are essential in the diagnosis and treatment planning of the partially edentulous patient (see Appendix 5).

(f) Consultations

It is often advisable to consult those more experienced in particular dental specialties regarding some facets of diagnosis. Their opinions should be sought using the consultation page towards the back of the patient's records. The report will then be written signed and dated by the person consulted and remain in the patient's records for reference. In addition, it may be necessary to seek an opinion from the patient's doctor. The sequence of such consultations is of importance since one often influences another. Frequently, but not invariably, it would be:

Medical
Periodontology
Conservative Dentistry
Orthodontics
Prosthetic Dentistry
Oral Surgery

C3 DEFINITIVE DIAGNOSIS/DIAGNOSES

A succinct statement of the patients present condition based upon an assessment of all the preceding histories, examinations and investigations. This/these should be recorded.

The Prognosis without treatment

It should be possible at this stage to make a judgement about the prognosis for the patient (that is, what is likely to occur in the future in the event of no treatment being given). This should be recorded, explained to, and discussed with the patient.

The response of the patient to preliminary plaque control instruction, and scaling where it has been necessary will be an aid to final assessment. The treatment of choice is decided at this point, taking into account all facts known to date.

D TREATMENT PLANNING

Treatment Planning is the process of collating all the pertinent information gained from the history and examination of a patient, and from this formulating treatment requirements for the patient, at that time, in those given circumstances.

When commencing to learn oral diagnosis, it is easy to understand why taking a history about a patient's complaint is essential in enabling a diagnosis to be established. It is also easy to understand why elements of the examination procedure are necessary in establishing a diagnosis of what is wrong with the patient.

At the outset of a professional life-time of oral diagnosis and treatment planning it is more difficult to understand why a history need be so wide ranging, including such apparent irrelevancies as the Family and Social History. Similarly it is difficult to grasp initially why an examination need be so comprehensive as to include, for instance, an examination of all oral mucosa, when the patient's complaint is about the teeth.

These difficulties in concept only exist when the end-point of the history and examination is seen to be establishing a diagnosis. However once a diagnosis has been made, there remains to be drawn up the most appropriate plan for treatment for that patient. This plan not only seeks to alleviate whatever may have formed the basis of the patient's complaint and to treat effectively all diseases that have been diagnosed, but it also aims to prevent further disease from starting, progressing and becoming established.

In order to formulate such an all-encompassing plan, it is necessary to have all the pertinent information available. It is for this reason that this manual contains guidelines for such extensive history taking and examination procedures. Only by learning such a detailed sequence of history taking and examination, can one ensure that all relevant information needed to formulate such a plan will have been gathered.

SEQUENCE OF TREATMENT PLANNING:

D1 EMERGENCY TREATMENT

(a) Immediate relief of symptoms

Historically, dentistry came into existence to provide immediate relief of the symptoms of acute dental disease. While Dentistry as a service to our communities has progressed far beyond the narrow perspectives of its humble beginnings, the immediate relief of symptoms, especially pain, is still a valuable service to be rendered for individual patients. Therefore when necessary, this precedes all other items in a treatment plan.

Very often the treatment to be delivered for the relief of symptoms is obvious, e.g. the extraction of a painful tooth, the restoration of which is impossible due to the extent of caries progression.

However on many occasions the most appropriate treatment is not so evident. On such occasions it is necessary to review all the data obtained from the history, examination and further investigations, before being able to determine a treatment plan which, in those circumstances, appears to be the most appropriate for the immediate relief of symptoms.

(b) Stabilisation

On those occasions when disease is at an advanced stage, so that it threatens the survival of a tooth or teeth, it is possible to control the disease, so that further progression is prevented, without delivering full effective treatment. This process of control of advanced disease is called stabilisation.

The most easily understood example of this procedure is a carious tooth in which caries is advanced and progressing, and if left to progress would endanger the pulp of the tooth, and so endanger the tooth. The caries can be almost completely removed, and a suitable dressing placed which ensures the arrest of caries progression and the protection of the pulp.

Thus the caries has been controlled through stabilisation but no definitive treatment (i.e. no restoration) has been delivered. Not only is this the best understood example of stabilisation, but it is also the most often practised example of stabilisation.

Thus stabilisation of caries when it is advanced and progressing, follows treatment for the relief of symptoms. If there are no acute symptoms and stabilisation is required, this is the first priority in treatment planning.

Together: (a) Immediate Relief of Symptoms and
 (b) Stabilisation

constitute EMERGENCY TREATMENT.

Emergency treatment always precedes Elective Treatment in any Treatment Plan. But when no Emergency Treatment is required the first items in a Treatment Plan are for Elective Treatment.

D2 ELECTIVE TREATMENT

Education, Motivation and Preventive Therapy

All elective treatment planned for patients is planned according to the overall embracing principles of prevention.

Prevention occurs at three levels:

Primary Prevention
Secondary Prevention
Tertiary Prevention.

Primary Prevention:

This aims at preventing the initiation of disease through the promotion of health in the absence of disease.

Obviously this involves the active participation of patients in Oral Health Education including dietary advice, the use of fluorides and the use of dental services. Primary prevention also involves the motivation of the individual to achieve health related goals through behaviour modification and the establishment of preventive attitudes. Primary prevention also involves Oral Hygiene Instruction as part of the education and motivation process (see Appendix 6: Dental Health Education).

Professional tooth cleaning, professionally applied fluorides and fissure sealants are elements of Primary Prevention which require active intervention by dental personnel.

Secondary Prevention:

This aims at the early diagnosis of incipient disease and the delivery of prompt and efficacious treatment to prevent this early disease from progressing.

Secondary prevention as a Public Health concept recognises that disease, once it has commenced, is most appropriately treated when it is in its early stages. In the Public Health context, Secondary Prevention implies that screening of individuals for early disease and ready access for treatment should both be available.

When dealing with individual patients, it is possible to state what constitutes appropriate treatment for disease in its early stages.

It is also possible to extend logically upon the base of Secondary Prevention as it applies to populations, and to consider those disease states occurring in individual patients for which prompt and efficacious treatment will prevent further disease progression.

Obviously with respect to caries, this involves early diagnosis and the appropriate treatment through fluoride therapy and restorations. With respect to chronic inflammatory periodontal disease this involves early diagnosis and appropriate treatment. Oral hygiene instructions and all treatment which removes plaque retention factors which might hinder control of plaque, forms the basis of such treatment.

Implicit in the definition and concept of secondary prevention is that new disease ought to be prevented, therefore no new disease should commence. In other words, for healthy sites disease should be prevented.

As Secondary Prevention requires early diagnosis, if this is to be delivered effectively, recall and re-evaluation of the patient will have to be included in any treatment plan.

Tertiary Prevention:

This aims at treating established and advanced disease, preventing further disease progression and preventing new disease from being initiated. This often involves limitation of the disability caused by the advanced disease and restoration of function by such means as replacing missing teeth.

However implicit in the concept of Tertiary Prevention is prevention of further and new disease. The replacement of missing teeth, or the complicated restoration of carious teeth cannot themselves be considered to be Tertiary Prevention unless the treatment seeks to prevent further or new disease from occurring.

As a guiding principle in treatment planning for Elective Treatment, each level of prevention should build upon the preceding level, commencing with Primary Prevention.

Thus the first group of treatment items which can be included in an Elective Treatment Plan are those of Primary Prevention:

- Oral Health Education (see appendix 6)
- Dietary Advice
- Oral Hygiene Instruction
- Professional Tooth Cleaning
- Fluoride Therapy
- Fissure Sealant Application

Restorations

As any advanced and progressing carious lesions will have been stabilised at the commencement of treatment, the next phase of treatment to be planned is that which falls within the extended range of Secondary Prevention as it applies to the individual.

Treatment of marginal gingival inflammation, with scaling and removal of other plaque retention factors as an adjunct to the Oral Hygiene Instructions.

Treatment of small carious lesions - Fluoride Therapy
Re-evaluation.

Treatment of more extensive carious lesions - Restorations.

Other disease problems can exist in patients' mouths, which if allowed to progress may result in more complex treatment being required. Treatment for such disease problems are planned at this stage also. This is because prompt and efficacious treatment at this stage can often avoid more complex measures being required later. Among these procedures are:

Treatment of pulp disease - Indirect Pulp Therapy
 - Direct Pulp Therapy
 - Endodontic Therapy.

Extraction of terminally involved teeth.

Extraction of part-erupted impacted teeth.

As this phase of treatment planning is based on the concept of secondary prevention, it is imperative that appropriate Re-call/ Re-evaluation for such patients be arranged. This item is placed to follow active intervention at an appropriate time interval.

Re-call/Re-evaluation.

Following these items of treatment in a treatment plan, when necessary, are placed those items which constitute Tertiary Prevention:

Treatment of Established/advanced and Progressing Chronic Inflammatory Periodontal Disease.

Treatment of the already stabilized Established/ Advanced Carious teeth - Complicated Restorations.

Restoration of Function - Replacement of missing teeth.

All the above treatment items should seek to prevent new disease from being started or established disease being allowed to progress.

It is also imperative that IATROGENIC DISEASE should not be caused.

The word 'Iatrogenic' means physician induced (Iatros: physician + genic). Iatrogenic disease is disease caused in the diagnosis or treatment of existing conditions. In dentistry the most common form of iatrogenic disease is that caused by the insertion of restorations, removable partial dentures and crowns and bridgework which are not cleansible, and which will therefore predispose to further plaque induced disease.

Because of this, it is essential that all restorations, removable partial dentures, crowns and bridges and the like, be designed so that they are cleansible, such that patients can exercise appropriate plaque control and so prevent further disease.

Review

Introduction:

Dental personnel often use many words to signify one concept. The word "Review" is one example of this phenomenon. Review is synonymous with Reassessment and Re-evaluation. These three words mean the process by which the oral health status of individuals is monitored at intervals.

This process involves the re-examination of the patient, often including the re-taking of elements of the history e.g. the complaint, the medical history. It involves re-establishing a diagnosis and formulating again, a treatment plan for whatever new, or residual, problems are encountered.

The three words Review, Reassessment and Re-evaluation all denote this practice. Review is the shortest and simplest word, and so is used in this manual.

"Review" must be specifically included in treatment plans at appropriate stages, depending upon the complexity of the treatment plan. It is understood that this review should be performed by the same dentist/dental student who first elaborated the treatment plan. This is very important, for in Hong Kong where many consumers are advised to shop around for the best buy, patients often do the same. It is seldom that this serves the patients' best interests. It is usually most appropriate for a review to be performed by the dental person who determined the need for that review.

This particular section of the manual deals with Review which must be written into the treatment plan. However it is worth recalling at the outset that often at each appointment with a patient, a brief review must be carried out. Obviously such a process of continuous review is not written into a treatment plan but must be understood to be an integral part of the treatment plan.

Continuous Review:

Much of dental treatment, for example Orthodontic and Periodontal treatment, requires constant monitoring during its performance. For these occasions, a process of continuous review is necessary. At each and every appointment a review of the success, or otherwise, of treatment already underway is necessary. In the event of any problems being discovered as a result of this review process, amendments to the treatment can be made.

With the principle of continuous review clearly understood, it is now possible to consider those occasions on which Review must be entered as part of the treatment plan for a patient. For the purposes of clarification, Review within the contexts of the three levels of prevention will be dealt with separately.

Review following Primary Prevention.

If all the elements of a treatment plan for a patient fall within the category of Primary Prevention, when these have been delivered arrangements should be made for the patient to be recalled so that the success, or otherwise, of the primary prevention can be reviewed. The period between delivery of the primary prevention and the recall is not necessarily a fixed time interval. It can be set to best suit that individual patient's oral health status. Many variables such as age, dietary habits, level of oral cleanliness, fluoride

exposure and previous oral disease experience can all contribute to the assessment of a suitable time interval between treatment and recalling a patient for review.

At the review appointment, for which the patient has been specifically recalled, the oral health status must be monitored.

Review within the context of Secondary Prevention.

If all the elements of a treatment plan for a patient fall within the categories of primary and secondary prevention but do not include such items as fall within the scope of advanced treatment to restore function, then a review is usually scheduled to follow the active delivery of treatment. In other words, when all the scaling has been performed and all the required restorations placed, following the instructions in oral hygiene and other preventive measures, the patients' oral health status ought to be reviewed prior to the patient being discharged from active care. It does not matter in which department this review takes place, so long as the situation is reviewed prior to the patient being discharged. For some items of treatment e.g. pulp therapy or pulp canal therapy, review at a later stage is an indispensable part of the item of treatment itself. An essential component of secondary prevention is arranging for that patient to be recalled for review within an appropriate interval.

The same guidelines, as have been outlined for recall/review after primary prevention, apply in deciding when the recall for review following this level of prevention and type of treatment, should take place.

However, the review must be written into the treatment plan when it is being formulated.

Review within the context of Tertiary Prevention.

In those circumstances in which the treatment plan for a patient involves the restoration of function through the delivery of crowns, removable partial dentures, fixed bridges or other complex items of treatment, it is usually advisable to schedule a review prior to embarking on the complicated treatment. This review usually follows the completion of all the items of treatment within the scope of primary and secondary prevention. This review is necessary to ensure that the advisability of performing the advanced/complex treatment has not been altered by the preceding treatment, or the patient's response to the preventive aspects.

As for the other levels of prevention and treatment, a recall for review must be scheduled to follow the provision of any appliance to restore function. Again, the time interval between treatment and the recall for review may be variable and depends upon circumstances.

Conclusion.

In essence, all dental treatment is undertaken applying the principle of continuous review. However there are definite indications for scheduling review appointments within the sequence of treatment plans for your patients. Review forms as integral a part of these treatment plans as any other "item of treatment".

SUMMARY OF ELECTIVE TREATMENT PLANNING

Thus the guiding principles for elective treatment planning are:

1. First of all, Effective Primary Prevention - including all relevant items of treatment in this category for that patient.
2. Then, Effective Secondary Prevention - including all relevant items of treatment in this category for that patient, PLUS the prompt and efficacious treatment of other progressive conditions.
3. Followed by Effective Tertiary Prevention - including all relevant items of treatment in this category for that patient at that time in those circumstances.

The preceding guidelines give the master-plan upon which your treatment plan for individual patients can be based. However often real-life compromises have to be implemented in treatment plans. Frequently these are occasioned by individual patient needs. Also, commonly, such compromises are indicated because individual responses to the preventive procedures, which form the foundation of this master-plan, are less than ideal.

In an ideal world, all pertinent information would have been gathered prior to formulating the treatment plan. However, in real-life, this being an imperfect world, more information often becomes apparent as treatment progresses. For this reason no treatment plan, once written, should be considered to be inviolable. For it often transpires that a treatment plan requires amending as treatment progresses, and more information (e.g. the actual extent of a carious lesion) becomes apparent. (Such amendments should only be made in consultation with the relevant group teacher).

As the nature of the items of treatment in each category becomes more complicated, their performance and success become more interdependent and interrelated with each other. Thus the more necessary are the skills in treatment planning the more complicated the treatment procedures become.

To assist students in the process of treatment planning for such cases, it is possible and advisable for you to gather all the pertinent information about the particular case to present to your teacher in a particular subject. Together you can then formulate an appropriate treatment plan, particularly for those items of treatment within the category of Tertiary Prevention, at a Consultation Appointment. If a prosthesis is being planned it should be designed at this stage, and the design recorded on the Appliance Design chart in the patient's records. Although the prosthesis will usually be constructed at the end of the treatment plan its design will influence some of the earlier items in the plan (e.g. restoration of abutment teeth).

The 'Treatment Plan' as finally entered on page 1 of the patient's records (see appendix 7) is a list of the treatment procedures needed by the patient arranged sequentially in the order in which the treatment should ideally be carried out. The treatment plan page must be correctly filled in with activity and procedure codes (see Appendix 8) for the patient's progress to be monitored using the computerised records system, and for the student to be credited with work completed. (This 'list' may be supplemented by more detailed prescriptions recorded in the Consultation Report and on the Appliance Design Chart).

E.F.C.
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July 1983

Objectives for First Term of 2nd Year Oral Diagnosis and Treatment Planning

At the end of the first term of the 2nd year the student should:

1. Understand the need for a careful assessment of his patients' general and dental health and the bearing of one on the other.
2. Be able to gain the confidence and interest of his patient.
3. Be able to record information gained about his patient clearly and accurately.
4. Be able to recognise and diagnose obvious pathological lesions of intra oral tissues.
5. Understand the relationship between plaque and dental disease and be capable of training his patient to control plaque.
6. Be capable of preparing articulated study casts.
7. Be capable of applying pulp vitality tests and interpreting intra oral radiographs.

Objectives for the Second and Third Terms of the 2nd Year Oral Diagnosis
and Treatment Planning Clinic

At the end of the second and third term of the 2nd year in Treatment Planning the student should:

1. Be able to apply the principles learnt in the first term.
2. Be able to assess patients' general and dental health.
3. Be able to assess patient's early response to dental health training by noting changes in oral health.
4. Be able to investigate and stabilize carious teeth.
5. Be capable of orientating and educating patients about the course of their treatment at the Prince Philip Dental Hospital.
6. Understand how an assessment of prognosis may affect a treatment plan.
7. Be capable of prescribing simple treatment plans.

APPENDIX IMEDICAL HISTORY : A GUIDE FOR JUNIOR STUDENTS

The following is a brief and, at times simplified account of the possible medical problems that can affect dental treatment. Fuller, more authoratitive accounts can be found in several admirable textbooks. Understanding of these texts, however, requires a reasonable medical knowledge on the part of the reader. Further reading is, therefore, not recommended to you at this stage of your training, a more appropriate time being when your studies include general medicine and surgery.

The medical history should begin with a general inquiry as to the patients' present and past medical well-being. Such questions as "How is your general health?", "Are you seeing your doctor at present?", "Have you had any serious illnesses in the past?", or, "Have you had to go to hospital for treatment" can form a basis upon which relevent and more specific inquiry can be made.

Specific medical conditions which are of relevance to dentistry will be discussed below. The order in which they are considered does not necessarily follow the order of questioning in the Medical History Questionnaire.

(I) CARDIOVASCULAR DISEASE

Dental treatment may be hazardous for such patients for one or both of the following reasons. The degree of risk will obviously be dependant upon the severity of the cardiovascular disease and the type of treatment envisaged.

- (i) Anxiety stress or pain caused by dental treatment may result in increased sympathetic activity and an increased load on the heart. Such loading may precipitate or aggravate existing heart failure, or bring about an acute attack of myocardial ischaemia.

Patients at risk will include those who have or have had:

- (a) Ischaemic heart disease (e.g. coronary thrombosis, anginal attacks, myocardial infarction).
- (b) Severe hypertension.
- (c) Heart failure.

- (ii) Susceptibility to infective endocarditis. Infective endocarditis is an uncommon severe infection which involves heart valves damaged by diseases such as rheumatic fever and congenital defects such as coarctation of the aorta or patent ductus arteriosus. It is fatal in about 30% of untreated patients. Though an oversimplification, its initiation requires the presence of two predisposing factors. Firstly, an existing cardiac lesion (e.g. rheumatic or congenital heart disease) and secondly a

bacteraemia (e.g. as caused by a dental extraction). The most common cause of such cardiac lesions is rheumatic fever. Other rarer causes are congenital heart defects and prosthetic valve replacement.

Patients at risk will include those who have or have had:

- (a) Rheumatic fever. Huntingdon's chorea, Brucellosis,
- (b) Congenital heart disease.
- (c) Cardiac surgery.

Recognition of Patients at Risk

General

All relevant positive responses obtained during initial inquiry should be followed up with the view to establishing the nature of the cardio-vascular disease and its past history. Further inquiry and observation should be made in order to assess the seriousness of the complaint. Can the patient walk up stairs or hills without pause? Does such exercise bring on chest pain (angina)? Is the patient taking drugs to control such pain? What other drugs is the patient taking? Of particular significance are anticoagulants (additional problems of excess bleeding) and prophylactic antibiotics for rheumatic fever. Relevant signs such as breathlessness, oedema (ankles) and cyanosis (lips, mucuous membranes) should be noted.

Such inquiry can only form a rough assessment of cardiac function and is not a substitute for thorough medical examination. This is beyond the scope of the dental practitioner and consultation with the patient's physician is recommended before treatment is commenced.

Patients at Risk from Infective Endocarditis

Specific inquiry should be made of all patients as to a past history of rheumatic fever, congenital heart disease, previous episodes of infective endocarditis, and cardiac surgery (e.g. prosthetic heart valve placement).

Patients so identified should be given prophylactic bacteriocidal antibiotic cover for any dental procedure that may result in a bacteraemia (is likely to cause bleeding). Such procedures will include dental extractions, surgery and scaling. It is unlikely to include most prosthetic restorative and orthodontic procedures but students should consult the supervising clinician when a positive history is elucidated and any of the above procedures are contemplated.

Implications to Treatment Planning and Management

Heart disease will usually remain with the patient for life and will often tend to deteriorate with age. Treatment should be based on a long term prognosis for the whole dentition. Short term measures are inadequate and simply result in repeated acute dental episodes at a later date when the cardiac condition may well have worsened. Most

patients with cardiac disease can withstand routine dental treatment under local anaesthesia, augmented where necessary with sedation (e.g. Diazepam). The anxiety and stress associated with such procedures can be greatly reduced by careful and considerate handling of the patient, and by ensuring effective local anaesthesia. With regard to local anaesthesia, there is a possible risk attached to the use of adrenaline containing anaesthetic solutions. Many clinicians, however, feel that the great reliability of lignocaine (xylocaine) with 1 in 80,000 adrenaline outweighs this theoretical disadvantage provided no more than three cartridges per patient are used. An adequate non-adrenaline containing alternative is prilocaine with felypressin. The student should consult the supervising clinician when a positive history of cardiac disease has been elicited. General anaesthesia for cardiac patients should be avoided wherever possible. Apart from the anxiety and stress frequently associated with its use, general anaesthesia presents a more particular hazard because of the adverse effects on myocardial activity and hypotensive effect of many anaesthetic agents. When necessary, a general anaesthetic should be given by an expert anaesthetist in a Hospital. G.A. given in the dental surgery is absolutely contraindicated.

(II) HAEMORRHAGIC DISORDERS

These can be caused by platelet and occasionally vascular disorders, or by disorders of the clotting mechanism, such as Haemophilia.

Recognition of Patients at Risk

Any suggestion of excessive bleeding must be taken seriously. However, patients do not often clearly understand what is meant by 'abnormal bleeding' and further inquiry will be required in order to assess the importance of a reported bleeding tendency.

Inquiry as to bleeding after previous dental extractions and surgery is often a useful start. Patients who have had previous extractions or tonsillectomy are very unlikely to have a serious bleeding disorder. An isolated episode of prolonged bleeding for 24-48 hours after extraction will most likely be due to local factors. Previous dental bleeding that was controlled by local measures (e.g. packs and socket sutures) is again unlikely to be due to a serious bleeding disorder. On the other hand admission to hospital, and blood transfusion or the like has serious implications. Other features of previous bleeding episodes may be relevant. Extensive bruising (bleeding into skin and mucosa) is suggestive of purpura. Deep bleeding into muscles, joints or skin is suggestive of a clotting disease. Most congenital clotting disorders will become apparent by childhood, though mild cases may remain undetected until adulthood.

Is there any other relevant medical history? Drugs such as anticoagulants, thiazide diuretics or corticosteroids may result in episodes of prolonged bleeding, as indeed may liver disease.

Management of Patients with Haemorrhagic Disorders

Dental treatment that may result in bleeding for such patients should be performed in specialist centres with the necessary facilities for laboratory testing, and replacement therapy.

Such dental treatment will include local anaesthesia administered as an infiltration and, more particular, as a regional block. Consultation with the patient's physician or appropriate specialist must be emphasised, as is long term treatment planning for the whole dentition. Particularly, in the younger patient, treatment planning should lay emphasis on patient education and prevention of dental disease.

(III) OTHER BLOOD DISORDERS

(i) Anaemia

The essential characteristic of anaemia is a reduced oxygen carrying capacity of the blood due to an abnormally low haemoglobin level. The most common causes of anaemia are chronic blood loss, pregnancy and iron deficiency, followed by Vitamin B12 and folate deficiency. Other rarer, but important causes of anaemia include haemolytic anaemias and the leukaemias (see later). The major risk occurs with general anaesthesia, due to inadequate oxygenation and a resultant inability of the heart to meet its demands. Dental treatment under general anaesthesia should be avoided until the anaemia has been corrected.

Recognition of Patients at Risk

Apart from a careful history, identification of the clinical features of anaemia is important in the recognition of such patients. Though the causes of anaemia are many, common clinical features are seen. More general features include lassitude, dyspnoea, skin pallor and brittle nails.

Oral features can include pallor of the mucous membrane, sore mouth, glossitis, angular cheilitis and oral ulceration.

(ii) The Leukaemias

The leukaemias are diseases in which there is a neoplastic proliferation of white blood cells. They are classified according to the neoplastic cell type and occur as acute or chronic forms. They are usually fatal if untreated.

Significance to Dental Treatment

There are many features of leukaemia that cause problems in the dental management of such patients.

These include: -

- (a) Increased susceptibility to infection.
- (b) Bleeding tendency.
- (c) Anaemia.
- (d) Drug therapy (particularly corticosteroids).
- (e) Hepatitis B.

Consultation with the responsible physician is essential before commencing treatment. Treatment should be conservative where at all possible. Extractions should be avoided because of the dangers of haemorrhage and severe post-operative infection. Regional local anaesthesia may be contraindicated. Anaemia may contraindicate the use of general anaesthesia.

Recognition of the Leukaemic Patient

Leukaemic patients will usually be identified in response to medical history questioning, i.e. they have already been diagnosed and are under treatment. It is however, quite possible for the dentist to be confronted with a leukaemic patient who is as yet undiagnosed. Certain oral manifestations are commonly seen and include spontaneous oral bleeding and petechia, pallor of the oral mucous membrane, gingival swelling, gingival ulceration and lymphadenopathy. More general features include anaemia, lymphadenopathy, bruising and bleeding tendencies.

(iii) Leucopenias

Reduced numbers of circulating granulocytes is the principal feature of leucopenia and this can be associated with many diseases. Agranulocytosis is the name given to the clinical syndrome resulting from leucopenia and is characterised by an abnormal susceptibility to infection.

Dental management of such patients is similar to those with leukaemia.

(IV) ENDOCRINOPATHIES

(i) Diabetes Mellitus

This is the most common endocrine disorder and is characterised by persistently raised blood glucose levels which results from a relative or absolute deficiency of insulin.

Diabetes is broadly classified into two types, maturity-onset (non-insulin dependent) and juvenile onset (insulin dependant). Control of the former is usually achieved by diet and hypoglycaemic drugs. Whilst the latter is normally controlled with exogenous insulin.

The Dental Significance of Diabetes Mellitus

The major risk to diabetic patients is the precipitation of hypoglycaemic coma due to disturbance of the balance between diet and insulin/hypoglycaemic therapy, as can occur as a result of dental disease and treatment. This is more likely to occur when the patient is controlled with insulin.

In general, routine non-surgical treatment can be carried out without problems provided that treatment does not interfere with mealtimes or insulin therapy (i.e. treatment after breakfast allowing the patient to eat a normal lunch).

Surgical treatment requires more caution. The precautions necessary will depend upon:

- (a) The extent of surgery.
- (b) The type and severity of the diabetes.
- (c) The amount of disturbance to food intake as a result of surgery.
- (d) The type of anaesthetic (in particular, general anaesthesia).

In general, such procedures should be performed in hospital where facilities exist for close monitoring of the patients' condition.

A further risk to the diabetic patient is that of increased susceptibility to infection and the possibility that infection can precipitate ketosis and hyperglycaemic coma. Existing infection should be vigorously treated and particularly with the poorly controlled diabetic (usually the insulin-treated type) antibiotics should be given to prevent post-operative infection.

(ii) Thyroid Disorders

Hyperthyroidism

The major risk is the precipitation of severe cardiac arrhythmias under general anaesthesia. In addition, untreated patients with increased hyperthyroidism may prove difficult to manage because of the increased state of nervousness and excitability associated with the disease. Adrenaline containing L.A. is contraindicated because of a possible hyper-reaction.

(iii) Adrenal Cortex Disorders

The adrenal cortex produces a number of corticosteroids. Adrenal corticosteroids are an essential part of the body's reaction to stress (e.g. trauma, infection, surgery and general anaesthesia) and are normally processed in increased amounts in response to such stress. Conditions in which there is adrenal hypofunction will prevent this normal response to stress and can lead to hypotension, collapse and death (adrenal crisis). Causes of adrenal hypofunction include:

- (1) Addison's Disease (primary hypoadrenocorticism), a rare disease characterised by atrophy of the adrenal cortex.
- (2) Systemic Corticosteroid Therapy (secondary hypoadrenocorticism)
The continued use of exogenous corticosteroids intercepts

the normal feedback mechanisms controlling adrenocortical function with consequent adrenocortical atrophy. This adrenal suppression can remain for as long as 12 months after cessation of treatment. Corticosteroids are used to replace missing hormones (e.g. Addison's disease or adrenalectomy) or more widely, for immunosuppression where they may be so successful as to mask an underlying serious disease. Patients receiving systemic corticosteroids will often demonstrate an increased susceptibility to infection.

Recognition of the Patient at Risk

(1) Addison's Disease

Apart from general features of fatigue, weight loss, nausea, dizziness and postural hypotension, an increased brown or black oral pigmentation is classically seen.

(2) Systemic Corticosteroids

Patients may or may not know if they are taking corticosteroids. However, most patients will not know why corticosteroids are being prescribed. Due to the propensity of corticosteroids to conceal underlying disease, it would be quite possible for a young man who appears perfectly fit and healthy to be in fact suffering from, for example, acute leukaemia, with all its attendant problems for future dental treatment. Regardless of the apparent health of the patient, efforts must be made to ascertain if and why corticosteroids are being prescribed and consultation with the patient's physician will often be necessary and advisable.

Management of the Patient at Risk

Most procedures will require supplementation of exogenous steroid before treatment is undertaken. This is achieved by either increasing the present corticosteroid dosage or by the intramuscular injection of hydrocortisone. Such precautions also apply to patients who have stopped corticosteroid therapy but have taken them regularly for more than 1 month during the past year. Intravenous hydrocortisone must be immediately available should the patient collapse, or the blood pressure fall. Current infections should be vigorously treated, and the prophylactic use of antibiotic to prevent post-operative infection may be advisable.

EPILEPSY

Epilepsy is a disorder of brain function characterised by episodic disturbances (fits) of consciousness and often of motor and sensory function. The cause of a patient's epilepsy is usually unknown. Clinically it is broadly classified as two types:

- (a) Major (Grand Mal) Epilepsy which normally affects adults. A major fit is characterised by a sequence of events which begins with a warning (aura) followed by loss of consciousness, stiffening of the body due to generalised muscular contraction (tonic stage), convulsions (clonic stage) and finally a prolonged recovery.
- (b) Minor (Petit Mal) Epilepsy which is restricted to children and is characterised by a sudden but brief arrest of movement, speech and attention, often described as 'absences'.

The main hazard is of a sudden grand mal seizure in the dental surgery. The likelihood of this occurring will obviously depend on the severity of the epilepsy and the efficiency of drug treatment to control the disorder. However, such an occurrence is always possible with any patient suffering from major epilepsy. Measures taken are aimed at preventing the patient injuring himself. Dental instruments should be removed from the mouth and where possible a dental prop or pad of gauze placed between the teeth to prevent the patient biting himself. If possible, the patient should be moved away from dental equipment and furniture, and laid flat in the 'head injury' position to maintain the airway and prevent inhalation of vomit. After an attack the patient will be confused and should be accompanied home.

Further implications for dental treatment mainly involve patients with severe major epilepsy where due to the frequency and severity of the convulsions, teeth and jaws are often fractured and present difficulties of permanent restoration. Phenytoin, an antiepileptic drug, can cause gingival enlargement in approximately half of patients so treated, though this is more noticeable in patients with poor oral hygiene.

RESPIRATORY DISORDERS

The major hazard to such patients is with general anaesthesia which may be contraindicated due to a reduced pulmonary function as may result from lower respiratory tract infections, lung abscess, bronchiectasis and tuberculosis.

Dental Aspects of Pulmonary Tuberculosis

The main risks in treating patients with a past or present history of tuberculosis are:

- (1) The Risk of Infection Patients with open pulmonary tuberculosis are contagious and when treated precautions must be taken to prevent infection of dental personnel and cross infection of other patients.
- (2) General Anaesthesia is contraindicated due to the risk of contamination of anaesthetic equipment and a likely impaired pulmonary function.

(V) HEPATITIS, LIVER DISEASE, JAUNDICE

A past or current history of the above may indicate that the patient has been or is infected with viral hepatitis. This infection is caused by at least four viruses of which only two, hepatitis A and hepatitis B virus, have been identified and characterised. It is the latter which is of most significance to dentistry.

Serum Hepatitis B

When healthy adults are infected with hepatitis B virus the vast majority develop a subclinical infection without jaundice. A small proportion will develop acute hepatitis with jaundice ranging from a mild illness to a more severe one lasting several weeks. Nearly all these patients will recover completely but a proportion (5-10%) will become carriers most of which will remain healthy. The risk exists that these carriers may infect dental personnel and cross infect other patients.

In both acute cases and carriers virus is present in the blood and in the fluid that exudes from wounds. It is also present in saliva but in very much smaller amounts. The inoculation of only very small amounts of infective serum (0.0001 ml) can cause infection. A much larger dose (0.5 ml) is required to infect by ingestion or by the inoculation of saliva. It follows that transmission most easily occurs by inoculation with a contaminated needle or by contamination of a wound with infective blood. Carriers can remain infective for up to 20 years after the initial contraction of serum hepatitis B.

Identification of Carriers

Given that the carrier state most often follows a subclinical infection of healthy patients who then remain healthy, it is unlikely that such patient can be identified by the medical history. However, certain high risk groups can be identified and include :

- (i) drug addicts (by injection);
- (ii) male homosexuals;
- (iii) institutionalised mentally subnormal patients;
- (iv) patients with acute or chronic liver disease.

Other groups of patients, while not high risk of themselves, are described as susceptible since they are likely to become highly infective carriers once infected. These include renal dialysis patients, transplant patients, immunosuppressed patients and patients with other haematological disorders. Serum hepatitis B is endemic in many Afro-Asian countries with an associated high carrier rate. This is at present true for Hong Kong where estimates of the carrier rate vary from 10% to as much as 30% of the population. Serological tests exist that can reliably identify carriers, but screening of all patients is normally impractical and probably not justified. Given the above prevention of possible infection by routine operator protection and high standards of surgery sterility must be emphasised.

Serological Testing

Infective blood can be identified by locating hepatitis Bs antigen (HBs Ag or Australia antigen) a viral surface protein produced by replication of the virus. Antibody to this protein (anti-HBs antibody) normally appears after recovery from infection. Presence of anti HBs antibody and absence of HBs Ag implies recovery and immunity from further infection. Other serological markers can give an indication as to the infectivity of carriers and those with active disease. For example, presence of HBe Ag, a soluble protein found only in serum which is positive for HBs Ag, is indicative of active disease and high infectivity. Development of anti HBe antibody and loss of HBe Ag usually indicates complete recovery and loss of infectivity. Asymptomatic HBs Ag carriers may possess anti HBe antibody and are less infective than those with HBe Ag.

High risk groups and those with a positive history of hepatitis, jaundice or liver disease of unknown cause should be screened serologically. Blood donations are routinely screened for HBs Ag, and donors advised that they should not give more blood may well be positive for HBs Ag and should be screened. Serologic screening should be performed before the patient is examined clinically.

Management of Known Carriers

With reasonable precautions, asymptomatic HBs Ag carriers who are not HBe Ag positive, can receive routine non-surgical treatment in dental practice. These precautions will be in addition to normal high standards of surgery hygiene and sterilization.

Carriers who are positive for HBe Ag should be treated in hospital departments where appropriate facilities are available.

(VI) RENAL DISORDERS

Some of the less common renal disorders (e.g. chronic renal failure and nephrotic syndrome) may present problems of dental management. These problems are associated with both impaired renal function and the medical and surgical treatment given. Likely problems can be

- (i) Impaired excretion of drugs (impaired renal function);
- (ii) Hypertension (impaired renal function);
- (iii) Immunosuppression (e.g. corticosteroids/renal transplant);
- (iv) Anaemia (impaired renal function);
- (v) Hepatitis B antigen carriage (renal dialysis).

Management of several of these problems has been considered previously. In general, such problems are more likely to be encountered in the patient with severe chronic renal failure. As the result of the impaired excretion of drugs, certain antimicrobials, analgesics, hypnotics and general anaesthetic agents may need prescription of a reduced dosage. Such drugs should only be prescribed after consultation with the patients' physician. General anaesthesia should be avoided where possible and is contraindicated in the dental surgery.

(VII) IRRADIATION THERAPY

Radiotherapy is often used as a palliative or curative treatment for cancer of the head and neck (e.g. nasopharyngeal carcinoma). Oral complications of such treatment include :

- (i) Xerostoma (dry mouth) following damage to the major salivary glands as a result of radiotherapy to, in particular, naso and oro-pharyngeal tumors.

- (ii) Caries and Tooth Hypersensitivity

A combination of reduced salivary flow, a change to a softer, more cariogenic diet to alleviate dryness and soreness of the mouth and tooth hypersensitivity (as a direct result of irradiation) making plaque removal difficult, can lead to rampant caries and the rapid destruction of a complete dentition.

- (iii) Osteoradionecrosis and Osteomyelitis

Death of bone, particularly in the mandible, can follow irradiation. Introduction of infection to such tissue, as may often occur with dental extractions or even ulceration caused by a denture, can lead to severe osteomyelitis which is very difficult to control because of overall reduction of tissue vascularity, and therefore of healing power.

Management of Patients Receiving Radiation Therapy to the Head and Neck

Emphasis is placed upon the prevention of post-irradiational complications. Whenever possible dental treatment, particularly extractions, should be completed before irradiation is given. All teeth of dubious prognosis (e.g. doubtful root canal treatments, teeth with deep periodontal pockets and heavily restored teeth) may act as a source of infection after radiation therapy, and

should be extracted, especially if these are in the direct path of irradiation. Patients should receive meticulous and regular dental surveillance after irradiation and any developing dental caries treated promptly. The use of daily topical fluoride and an effective oral hygiene regime should be maintained.

Extractions after irradiation should be approached with great caution, in view of the risk of subsequent osteomyelitis. The risk of this occurring will vary with the number and amount of radiation dosages, the target area (extractions in the mandible being most problematical) and with the time since the last course of radiation therapy. With regard to the latter, extractions of teeth in affected areas can be followed by post extraction infection regardless of the time since radiation therapy was completed but should, where possible, be avoided for 2 years post irradiation. All such extractions should be covered by prophylactic antibiotics.

(VIII) ATOPIC ALLERGY

Atopic allergy is the most common immunologically mediated disease. Clinical types of atopic allergy include asthma, hayfever, urticaria and food allergy.

The main significance of such a history to dental treatment is:-

- (i) Increased risk of hypersensitivity reactions to drugs prescribed in dentistry (particularly penicillin).
- (ii) Drugs used in the treatment of the allergic disease (e.g. corticosteroids).
- (iii) General anaesthetic hazards in asthmatic patients.
- (iv) The possibility of severe asthmatic attacks in the dental surgery.

(IX) DRUG THERAPY

Systemically administered drugs can have the following affects relevant to dental treatment.

- (i) Drugs may complicate dental treatment itself (e.g. anticoagulants).
- (ii) Drugs may react with or potentiate drugs given for dental purposes (e.g. hypotensive agents in a patient given general anaesthetic). In fact, relatively few drugs are prescribed in dentistry and such problems do not often occur.
- (iii) Drugs may give rise to a stomatitis or other oral signs.

Commonly Used Drugs Which Can Cause Complications During Dental Treatment

(1) Antibiotics

More common complications include candidal stomatitis resulting from depression of the normal oral flora, and

hypersensitivity reactions. This most often occurs with the use of Penicillin and varies from rashes (urticarial and irritating) to a serum sickness type of reaction. The most severe and dangerous reaction is anaphylaxis.

Anaphylaxis

Anaphylactic reactions are uncommon, and more usually follow parental administration of penicillin but may follow oral penicillin. Onset of the reaction is usually sudden varying from half a minute to half an hour. In general, the more sudden the onset the more severe is the reaction likely to be. Clinical features vary but can include:

- (a) hay fever like symptoms with sneezing;
- (b) paraesthesia of the face;
- (c) asthmatic dyspnoea;
- (d) urticaria;
- (e) partial or complete loss of consciousness;
- (f) circulatory failure with pallor or cyanosis;
- (g) fall in blood pressure and a weak or impalpable pulse;
- (h) respiratory failure and death.

Treatment is most effectively given by

- (a) laying the patient flat and raising the legs;
- (b) giving an intramuscular injection of 0.5 ml of 1:1,000 adrenaline slowly (a minim a minute);
- (c) giving an intravenous injection of 100 mg hydrocortisone;
- (d) applying cardiopulmonary resuscitation should the heart stop;
- (e) summoning medical assistance.

(2) Anticoagulants

These are often prescribed to patients with underlying heart disease, most frequently after coronary thrombosis or cardiac surgery.

With adequate haematological supervision to adjust drug dosage, bleeding after extractions can be controlled. However, consultation with the relevant physician or haematologist must be made before dental treatment is commenced.

(3) Hypotensive Agents

These are used in the treatment of hypertension. They may potentiate the hypotensive effect of many general anaesthetic agents.

(4) Hypnotics, Sedatives and Tranquilisers

These may :

- (a) Potentiate each other, general anaesthetic agents and hypotensive agents.
- (b) Cause dry mouth with its attendant problems.
- (c) Barbiturates are rare causes of acute stomatitis or erythema multiforme exudativum (Stevens-Johnson Syndrome).

(5) Antihistamines

These may cause drowsiness, dry mouth or potentiate sedatives.

(6) Insulin - see Diabetes(7) Corticosteroids - see Adrenal Cortex(X) PREGNANCY

Pregnancy is not a contraindication to routine dental treatment for the healthy mother to be. This should, however be qualified by the following :

- (i) Avoid prescribing drugs, wherever possible, but especially in the first trimester where general anaesthesia is also a particular hazard. Avoid tetracycline (tooth discolouration).
- (ii) Avoid radiographs again particularly in the first trimester. If essential ensure adequate protection (lead apron).
- (iii) Prolonged treatment sessions are best avoided particularly in the second and third trimesters where such treatment can be very uncomfortable and tiring to the patient. Treatment of any kind is best avoided in the last month of pregnancy. Hypertension may be a particular complication at this stage, and calls for rest, not dental treatment.
- (iv) Where there is a history of repeated miscarriage, abortion or still-birth, it is wise to postpone as much treatment as possible until after birth and to avoid the use of drugs and radiographs. In such cases, dental treatment may unfairly be considered as being responsible for any mishap occurring during the pregnancy.

APPENDIX 2FURTHER RADIOGRAPHIC VIEWSPeriapical radiographs

These radiographs demonstrate the full length of a tooth and its supporting structures, including the adjacent teeth. They may be used to supplement the Panelipse by providing more detailed information regarding the following:

- a) morphology of root and pulp canals, and relation to adjacent anatomical structures.
- b) alveolar crest height.
- c) infra-bony pockets.
- d) pathological conditions arising from, or affecting, the teeth.

Two techniques are commonly used in periapical radiography - the bisected angle technique and the paralleling technique. The technique of choice is dependent on the clinical situation and the information sought.

Occlusal radiographs

These are taken with the film packet held in the occlusal plane. They demonstrate on one film a greater number of teeth than a periapical radiograph.

Oblique lateral radiograph

This extra-oral view may be taken to demonstrate a particular region of the mandible, which must be specified.

Bimolar radiograph

This is a modification of the oblique lateral view to demonstrate both upper and lower cheek teeth of one side on the same film. The technique is normally used for children and will provide information regarding the following:

- a) the presence and position of developing permanent teeth.
- b) approximal and occlusal carious lesions.
- c) other pathological conditions of the teeth and jaws.

The bimolar radiograph is particularly useful for small children who are not suitable for the Panelipse, and for those who cannot tolerate bite-wings. There is a large number of further radiographic views that may be used. These will be dealt with separately later in your course.

Name of Patient

EXAMINATION OF THE TEETH AND SUPPORTING TISSUES

1								2							
18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
7															
6															
5															
4															
3															
B															B
2															
L															L
18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
1															
B															B
5															
L															L
1															
L															L
8															
B															B
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
L															L
2															
B															B
3															
4															
5															
6															
7															
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
4								3							

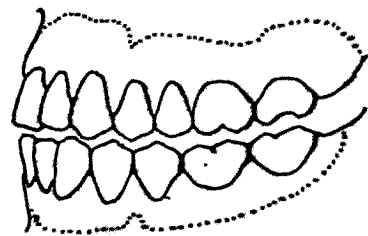
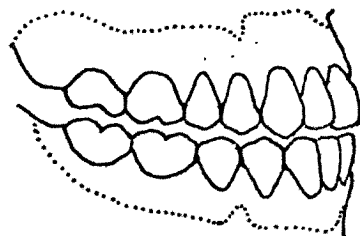
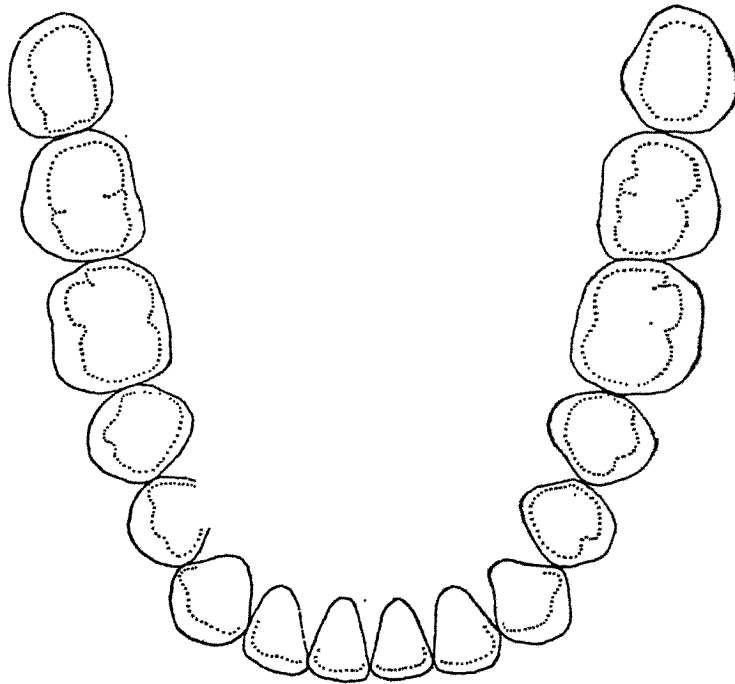
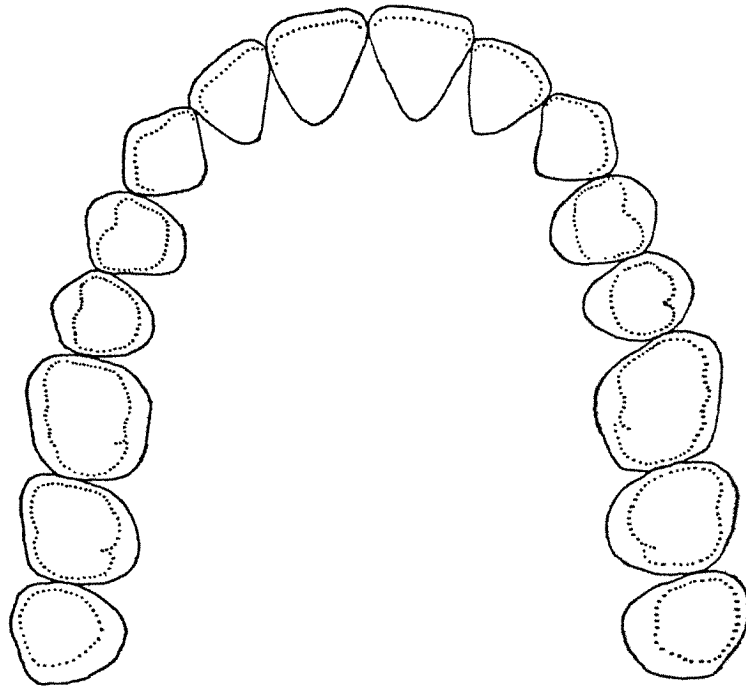
Row 1 Primary Teeth, Present Condition
 Row 2 Permanent Teeth, Present Condition
 Row 3 Restorative Treatment Plan
 Row 4 For Review, Special Features - EPT

Row 5 Recession ✓
 Row 6 Probing Depths Greater Than 3mm
 (Bleeding From Pocket Depths Marked In Red)
 Row 7 Calculus, Furcation Involvement

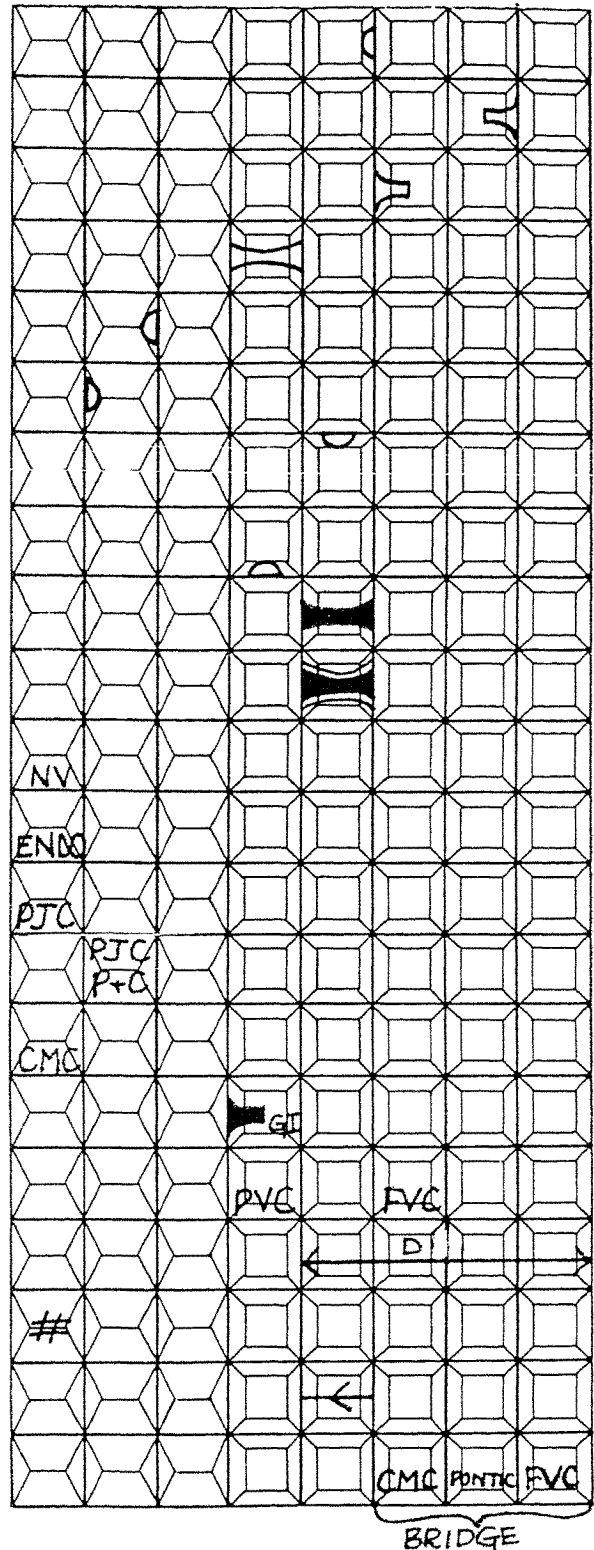
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Name of Patient

APPLIANCE DESIGN



- Distal Lesion (e.g. Bitewing Lesion)
- Disto-occlusal Lesion (D.O.)
- Mesio-occlusal Lesion (M.O.)
- Mesio-occlusal Distal Lesion (M.O.D.)
- Distal Lesion (Anterior Tooth)
- Mesial Lesion
- Buccal Lesion
- Lingual Lesion
- M.O.D. Restoration Present
- M.O.D. Restoration to be replaced
- Non-vital Tooth (N.V.)
- Endodontically Treated Tooth (Endo)
- Porcelain Jacket Crown (P.J.C.)
- Porcelain Jacket Crown with Post and Core (PJC, P + C)
- Ceramo-metal-Crown (C.M.C.)
- Gold Inlay (G.I.)
- Partial Veneer Crown/Full Veneer Crown
- Denture Present
- Fracture
- Tooth Movement
- Bridge Present



Row 3: The Restorative Treatment Plan (Amended as Treatment Progresses)

	21	22	23	24	25	26	27	28
Occlusal Amalgam (Recently Completed)				●				
Mesio-occlusal Amalgam						┌		
Mesial Composite		┐						
Mesio-occlusal-Distal Gold Inlay						┌		
Endodontics	ENDO							
Porcelain Jacket Crown		PJC						

Row 5 This is for recording Recession. Measure recession to the nearest millimetre, using the periodontal probe, from the cement-enamel junction to the gingival margin, if neither landmark is obscured. It is usually sufficient to record only the greatest measurement of recession on the buccal and the lingual surfaces of a tooth, i.e. one figure for the buccal surface and one figure for the lingual surface.

On occasions when recession is generalized, your teacher may direct that recession be recorded at six sites around each tooth, these sites corresponding to the sites of measurement of probing depths.

Sequence of examination:

Ensure that missing teeth are suitably blanked out. Commence at the buccal aspect of 18 and record the measurements of recession at the buccal aspect 18 -28. Next record recession measurements on the lingual aspects of 28 - 18. Follow the same sequence for the 38 - 48.

Row 5: RECESSION

	21	22	23	24	25	26	27	28
Buccal Recession (in mm.)			1	2				
Lingual Recession (in mm.)						3		
Generalised Recession (Measured in mm. at six sites)							232	
							453	

Row 6 This is for recording Probing Depths in excess of 3 mm and for recording Bleeding on Probing the depths of the pocket or sulcus. Measure probing depths from the base of the probing defect (pocket) to the gingival margins, to the nearest millimetre using a periodontal probe, at six sites (distobuccal, mid-buccal and mesio-buccal, distolingual, mid-lingual and mesio-lingual) around each tooth. Where the measurement is in excess of 3 mm enter the measurement in the appropriate compartment of the appropriate box in Row 6.

Sequence of examination:

Ensure that missing teeth are suitably blanked out. Commence at the distobuccal aspect of 18 and proceed to the distobuccal aspect of 28 probing the buccal aspects only. Having probed the buccal aspect of the arch, and having recorded depths of 4 mm and more, in the appropriate boxes, examine the sites of probing commencing at 18, using a mouth mirror, and note, suitably in red, in the appropriate compartments, those sites which exhibit bleeding. If the probing depth was 3 mm or less place a red circle in the box. If there is a figure entered, (4 or more) circle this in red. Then proceed in like manner to probe the lingual aspects of 28 - 18 and likewise record the sites of bleeding. Follow a similar sequence for 38 - 48, starting at 38.

Row 6: Probing Depths > 3 mm.

Bleeding From Probing Depths
N.B. marked in Red.

21	22	23	24	25	26	27	28
		0	0	000	0	000	

Probing Depths (Greater than 3 mm.)

		4		5			75
55					4	6	

Probing Depth of 5 mm., with Bleeding

				5			

Row 7 This is for recording the presence and type of calculus.

Examine for calculus using a suitable probe. Record the presence of supragingival calculus without subgingival by placing the figure 1 in the appropriate area of the box corresponding to the tooth surface. The figure 2 is placed in the appropriate area of the box corresponding to that tooth surface when subgingival calculus is detected (even when supragingival calculus is detected at the same site.) It is usually only necessary to record one figure for calculus for each tooth, but your teacher may direct you to record calculus located on specific tooth surfaces.

Furcation involvements may also be recorded in Row 7. The means of recording a furcation involvement and the direction(s) from which a furcation can be probed, is to place an open arrow ► in the appropriate area of the appropriate box indicating the direction of probing, for those furcation involvements in which some periodontal attachment remains, and a closed arrow (blacked out) ◀ similarly placed for those furcations in which no periodontal attachment remains.

Plaque and Gingival Response: Continuous Reassessment Labels

These stick-on labels are to be stuck into the patients folder on the "day sheet". Each entry is to be dated.

The use of these labels is two-fold:

1. For the operators benefit, to document precisely the Plaque Control Status and the corresponding Gingival Response of the patient, as treatment progresses.
2. For the patients benefit, to document and score their improved efforts in controlling plaque. This can act as a motivational tool in providing patients with some limited and achievable short-term objectives.

These labels and this documentation can be used at any and all stages throughout a patients treatment. They are to be used on the guidance of the supervising teacher.

Plaque - This is for recording the presence of Plaque. Each tooth box is subdivided into four compartments representing the buccal, lingual, mesial and distal aspects of the tooth.

If, after drying with the air syringe, plaque is evident at, or can be collected on the end of a probe from, the gingival margin area of a tooth surface, an X is placed in the appropriate compartment of the corresponding box representing that tooth surface.

Alternatively, your teacher may suggest that plaque be disclosed. In these circumstances the examination for plaque is simply a visual one. The recording procedure is the same.

Sequence of examination:

Ensure that missing teeth are suitably blanked out. Commencing at 18, examine for the record the presence of plaque at the buccal and mesial aspects of 18-11, and the buccal and distal aspects of 21-28. Then examine and record plaque on the lingual and mesial aspects of 28-21, and the lingual and distal aspects of 11-18. A similar sequence is advised for recording plaque on 38-48, commencing at 38.

The box at the extreme right of these rows is for recording the total of the available tooth surfaces examined on which plaque was detected.

Bleeding - This is for recording the presence of Gingival Bleeding. The orifice of the gingival sulcus or pocket is gently probed with a periodontal probe, and if bleeding is evoked an X is inserted in the compartment of the appropriate box representing the tooth surface adjacent to the inflamed Gingival Margin.

Sequence of examination:

Ensure that missing teeth are suitably blanked out. Commence gentle probing at the buccal and mesial surfaces of 18-11, and proceed to the buccal and distal surfaces of 21-28. When these gingival margins have been gently probed, examine these probed gingival margins starting

at 18, using only a mouth mirror, and record those margins which bleed. Then probe the lingual and mesial gingival margins at 28-21, and the lingual and distal gingival margins at 11-18, and examine these, starting at 28, in the same fashion, recording bleeding similarly. Adopt the same sequence for 38-48, starting at 38.

The box at the extreme right of these rows is for recording the total of the probed gingival margins which bleed.

	1								2								
leeding																	
Plaque																	
	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	
Plaque																	
leeding																	
	4								3								

Suggested abbreviations for O.D. & T.P. (& P.P.D.H.)

Amal	= Amalgam	L.A.	= Local Anaesthetic
Ag	= Silver	M.C.P.	= (aqueous) Mono Chloro Phenol
Au	= Gold	M.O.D.	= Mesio-Occlusal Distal
B.S.S.	= Black Silk Suture	M.O.	= Mesio-Occlusal
BWs	= Bitewings	N.V.	= Non Vital
L.BW	= Left Bitewing	O.D. & T.P.	= Oral Diagnosis & Treatment Planning
R.BW	= Right Bitewing	O.H.I.	= Oral Hygiene Instruction
C.L.	= Complete lower denture	O ₂	= Oxygen
C.M.C.	= Ceramo-metal crown	P & C	= Post and Core
C.O.	= Complaining of	P.C.T.	= Pulp Canal Therapy
C.R.R.	= Composite Resin Restoration	P.E.	= Partially Erupted
C.U.	= Complete Upper Denture	Per	= Periapicals
D.N.A.	= Did not attend	// Per	= Paralleling technique
D.O.B.	= Date of birth	P.D.H.	= Previous Dental History
D.O.	= Disto-Occlusal	P.J.C.	= Porcelain Jacket Crown
E.C.	= Ethyl Chloride	P.L.	= Partial lower denture
Endo	= Endodontic therapy	Pt.	= Patient
E/O	= Extra Oral	P.U.	= Partial Upper Denture
E.P.T.	= Electric Pulp Test	R _x	= Prescription/Therapy
F.A.	= Fixed Appliance	S.C.	= Study Casts
F.V.C.	= Full Veneer Crown	T.C.A.	= To Come Again
G.A.	= General Anaesthetic	T.M.J.	= Temporomandibular Joint
G.D.P.	= General Dental Practitioner	T.P.	= Treatment Plan
G.I.	= Gold Inlay	T.T.P.	= Tender to Percussion
G.M.P.	= General Medical Practitioner	U	= Unerupted
G.P.	= Gutta Percha	U.R.A.	= Upper Removable Appliance
H.S.M.B.	= Hot Saline Mouth Bath	X-rays	= Radiographs
I.D.	= Inferior Dental	ZnO	= Zinc Oxide
Imps	= Impressions	ZOE	= Zinc Oxide Eugenol
I.M.	= Intra Muscular	#	= Fracture
I/O	= Intra Oral	△	= Diagnosis
I.R.	= Immediate Replacement prosthesis	♂	= Male
I.V.	= Intra Venous	♀	= Female
		6/12	= Months
		2/52	= Weeks
		3/7	= Days

THE PRINCE PHILIP DENTAL HOSPITAL

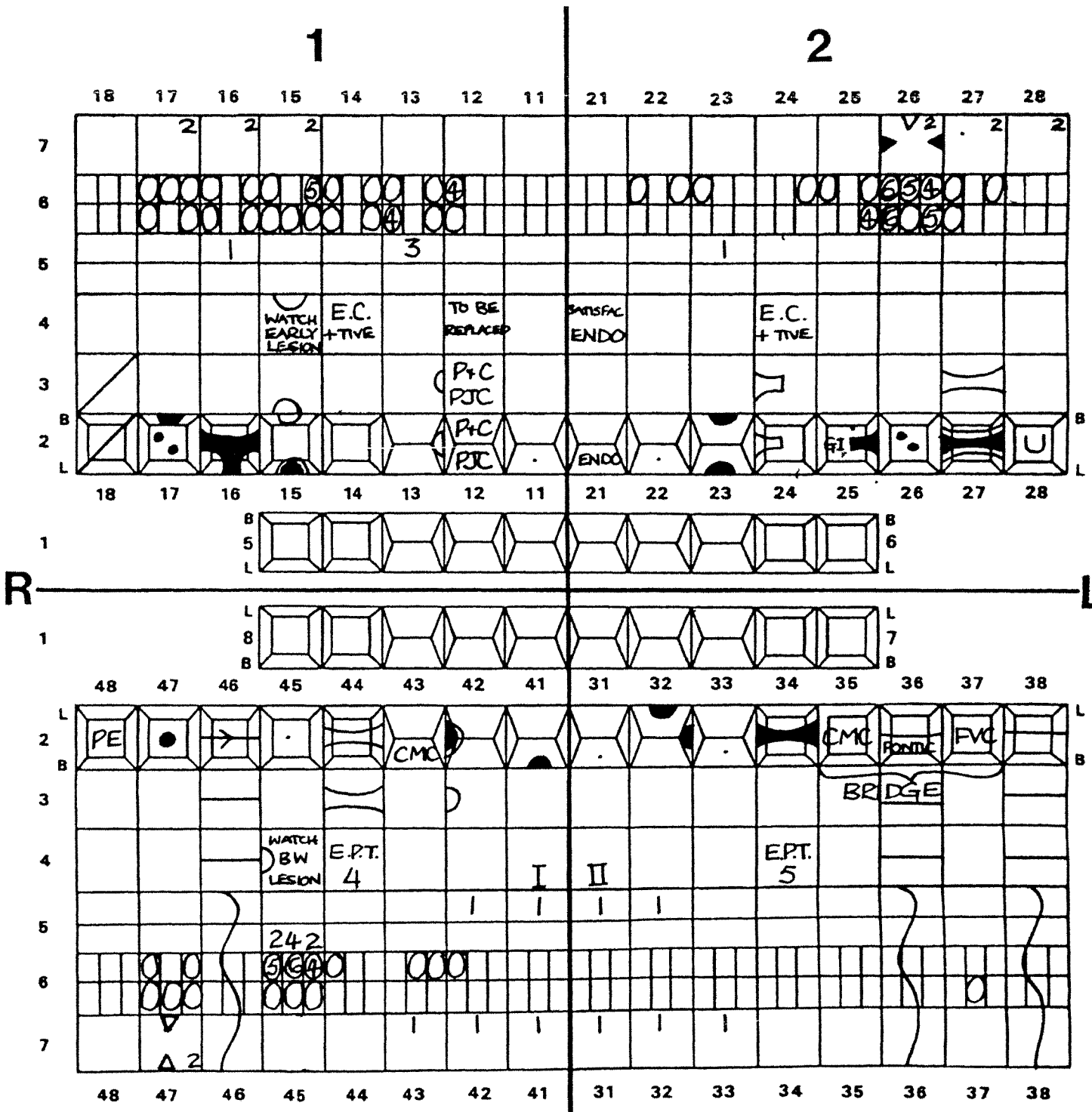
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Appendix 3

Date

Name of Patient

EXAMINATION OF THE TEETH AND SUPPORTING TISSUES



- 02

02

99L

999

300
310
320

900

5L

5D

001

RED

ED

4

3 N.B. CIRCLES MARKED IN RED.

- Row 1 Primary Teeth, Present Condition
- Row 2 Permanent Teeth, Present Condition
- Row 3 Restorative Treatment Plan
- Row 4 For Review, Special Features

- Row 5 Recession
- Row 6 Probing Depths Greater Than 3mm (Bleeding From Pocket Depths Marked In Red)
- Row 7 Calculus, Furcation Involvement

APPENDIX 4

THE ELECTRIC PULP TESTER

The E.P.T. is an instrument designed to electrically stimulate the dental pulp both selectively and safely.

A square wave electrical signal of known amplitude and frequency is applied to the tooth whilst its duration, and the frequency between the pulses are controlled. Typical output is from 0-220 volts and the frequency is set at 100 c/sec, the pulses therefore being of 0.01 seconds duration.

The stimulus is applied to the tooth by means of a probe, possessing a single electrode contact insulated from an outer sheath. Good electrical contact with the tooth is achieved by means of prophylaxis paste or electrode jelly and the circuit is completed through the patient's face, the operator's hand and the outer sheath of the probe (with many designs therefore the operator cannot wear gloves for this procedure.) The routine to be followed is:

1. The tooth concerned is isolated from moisture with cotton wool rolls.
2. Impulses may be transmitted to neighbouring teeth (particularly with metallic restorations) the tooth is insulated by means of celluloid strips or rubber dam.
3. A 2 mm diameter spot of 'conducting medium' is painted on to the tooth, usually near the centre of the buccal surface.
4. The E.P.T. is checked to make certain that the output is turned to zero and then switched on.
5. The patient is requested to signal at the first sign of sensation from the tooth.
6. The electrode is applied to the conducting medium and the control on the E.P.T. is turned slowly until a response is elicited, or until the maximum point is reached.

No response may indicate a necrotic pulp but the E.P.T. must be checked to ensure that it is switched on and functioning.

If there is a response the number on the dial should be noted. This is a measurement of the pain perception threshold and is called the threshold value of the tooth. The pain should be so slight that most patients describe it by words such as tingling, cold or hot. A response may indicate the presence of living nerve tissue but such a response may be elicited from a tooth with a moribund pulp, provided that there are still vital remnants present.

The threshold value will vary from individual to individual and often from tooth to tooth in the same arch, although in the latter case the variation should not be very gross.

It is for this reason that the 'Normal' response for a tooth must be assessed by testing at least one other tooth in the same mouth (preferably before the suspect tooth).

The results must be interpreted with caution and only be used as a guide to the probability of the pulp being vital, hyperaemic (suggested by a lower than normal result) or necrotic (suggested by a higher than normal reading). Spurious results are relatively common.

APPENDIX 5

PREPARATION OF ARTICULATED STUDY CASTS

The diagnostic value of study casts can be greatly enhanced by their accurate location in an adjustable articulator by means of a jaw registration. Indeed, for the partially edentulous mouth mounted study casts should be considered an essential prerequisite to any diagnosis and treatment plan. In this situation articulated diagnostic models may serve the following functions:

1. Give an indication of the loss of hard and soft tissues in relation to the dental arches.
2. Permit a detailed study of the morphology of the remaining hard and soft tissues by the use of a dental surveyor.
3. Permit an occlusal analysis to be performed and provide detailed information at all stages in occlusal correction.
4. Facilitate the design of a partial prosthesis. In particular, they assist in the optimum location of support, retention, bracing components and connector in relation to the path of insertion of removable partial dentures.
5. Indicate mouth preparation requirements.
6. Enable artificial teeth to be arranged and diagnostic wax-ups to be performed for assessment at the chairside prior to the construction of the prosthesis.

STAGES IN PRODUCTION OF ARTICULATED STUDY CASTS

The stages in production of study casts are described below, you should read the relevant section in the Partial Denture Manual for the theoretical background.

The production of articulated study casts requires the following stages:

- I. Impressions;
- II. Pouring the casts;
- III. Assessment and registration of jaw relationships;
- IV. Face bow record;
- V. Mounting the casts in an articulator.

I. Impressions for Study Casts

Requirements of impressions for study casts

Impressions are made using alginate in rigid perforated metal trays.

The alginate should be firmly attached to the tray and no large bulk of the material should be unsupported.

The alginate should be at least 3 mm thick to retain its elastic property on removal from undercut areas without tearing.

The surface of the impression should be free from air and saliva bubbles and all surface detail should be clearly recorded.

The Maxillary Impression should record:-

- (a) The erupted and any partially erupted teeth.
- (b) The palate extending just beyond the junction of hard and soft palate to a line drawn between the hamular notches.
- (c) The fraenae and extent of the vestibular reflection.

The Mandibular Impression should record:-

- (a) The erupted and any partially erupted teeth.
- (b) The extent of the lingual sulcus, including the retromylohyoid fossa, with the mylohyoid muscle in its elevated position.
- (c) The fraenae and extent of the vestibular reflection.

Procedure

- (1) Select trays which should be at least 3 mm clear of teeth and alveolus both lingually and facially, and practice inserting and removing these from the mouth.
- (2) Where necessary composition additions may be made to the border of the tray if this is more than a few millimetres short of the vestibular reflection. If a deep palatal vault is present it may also be necessary to add composition to the tray in this region to support the alginate. Surface water is shaken from the heated composition which is then kneaded.

The tray is dried and warmed and the composition placed. The surface of the composition is passed quickly through a flame to reheat the outer layer. The whole tray is immersed into a bowl of warm water to temper the composition and thereby ensure that the mucous membrane will not be burned.

The tray is then seated and held stationary whilst the composition hardens. When making additions to the lingual border of the lower tray the patient should be requested to hold the tongue in a forwards position to ensure that the mylohyoid muscle is in its contracted and elevated position.

After removal of the tray, the composition is chilled in cold water and 3 mm is removed with a sharp knife from the border to allow space for the alginate. Any composition which has flowed close to the teeth should be trimmed back to allow a minimum of 3 mm space for alginate.

- (3) Dry the tray and apply a thin layer of adhesive to the inner surface of the tray. Leave the tray for two minutes to allow the adhesive solvent to evaporate.
- (4) Pour the appropriate number of measures of cold water ($21^{\circ} - 25^{\circ}\text{C}$) into the mixing bowl and sift in the alginate powder measured by weight (2 measures should be adequate for most impressions).
- (5) Spatulate for 45 seconds and load the tray.
- (6) Carefully dry the teeth with a gauze square.
- (7) Place a small quantity of alginate in the vault of the palate and into the embrasures of the teeth and occlusal fissures.
- (8) Whilst retracting the patient's lips, insert the tray and seat this first at the front and then at the back. Some authorities recommend seating the back of the impression first. There are no hard and fast rules. What any particular operator does is a matter of personal choice depending on what is found to be most suitable.

II. Handling and Casting Impression

The construction of an accurate prosthesis is obviously dependent upon an accurate impression and the production of an accurate cast of that impression. The following recommendations applicable to alginate impressions are made to ensure that as far as possible those inaccuracies which arise in the fabrication of stone casts are minimal.

The following assumes an accurate impression. It is the dentist's responsibility to ensure that:

- (a) voids do not appear in critical areas;
- (b) all areas to be covered by the prosthesis are included in the impression;
- (c) alginate is not torn in critical areas;
- (d) alginate has not pulled away from the tray;
- (e) the tray or compound does not show through the alginate, particularly in the area of the teeth.

Should the technician feel that the above criteria are not met, the dentist should be informed. It is always easier to remake an impression than to remake a prosthesis.

Immediate pouring of the impression is essential. Casts are prepared by a TWO-STAGE POUR:

1. Wash the impression with tap water;
2. To remove saliva, brush the impression with artificial stone, using a soft camel-hair brush. Care should then be taken to remove all stone from the impression by further washing;
3. Draw a line around the outside of the impression 5 mm from the deepest part of the sulcus impression;
4. Suspend the impression horizontally by its handle in a holder either fixed to the wall or included in a work bench (at NO TIME should alginate extending beyond the tray be allowed to touch the laboratory bench);
5. Vacuum spatulate the mix of correctly proportioned artificial stone (BY WEIGHT) and DISTILLED WATER* (MEASURED);
6. Remove all surface water or liquid from the impression with air and, if necessary, blot the surface with tissue paper (DO NOT use a strong blast of air as this may dislodge parts of the impression). The impression surface should be shiny, with no visible liquid film or droplets but not dry.
7. Gently vibrate the stone mix into the impression, leave the base rough and with undercuts, and re-suspend in the holder;
8. When the stone is warm, soak in SLURRY WATER*;

*Distilled water

The manufacturers specification with regard to water/powder ratio, expansion etc. are arrived at through controlled laboratory trials using distilled water. Impurities in tap water, such as metallic salts, can have an undesirable and unpredictable effect upon these specifications. Further, unless there is information with regard to the purity, or otherwise, of the cold-water supply and to the variation of any contained impurities that may occur throughout the year, the use of distilled water for the mixing of all dental stones would seem desirable.

*Slurry water

This can be easily made up by placing stone debris or particles in a container of water and allowing the mixture to soak for 48 hours. The resultant supernatant can be placed in containers conveniently positioned to allow rinsing of stone models during their preparation and trimming.

9. Add a new base using a mix of the same material and proportions, extending the stone to the line previously drawn around the impression. No attempt should be made to fill-in the tongue space with wax, gauze etc., rather excess stone is removed and the area flattened and smoothed;
10. Separate three quarters of one hour after the first pour, carefully removing any retained alginate. DO NOT trim immediately;
11. Allow the cast to set for at least 1 hour. Then soak in slurry water and trim, rinsing the sludge from the cast with slurry water as grinding proceeds;
12. Immediately after trimming remove all remaining sludge with slurry water and, if necessary, brush with a fine camel-hair brush.
13. When reasonably dry, the cast should be inspected by the dentist who should remove any nodules of stone;
14. Casts should NOT be articulated until they are dry.

III. Jaw Registration

Fundamentally, jaw registration can be divided into two steps:

- A. Mounting the casts whereby upper and lower are brought into their desired relationship.
- B. Adjusting the articulator to the sagittal condyle path and to the Bennett shift by setting the condylar tracks.

The standard method of jaw registration

The main purpose of the articulator is the reproduction of definite basic positions such as the retruded axis position and the intercuspal position as well as protruded and lateral positions. Before operative procedures are started it should be determined if the patient's present occlusal relationships are adequate and justify perpetuation in future restorations or appliances. Such a decision can frequently be based on clinical evidence alone and upper and lower study models can then be mounted to the existing intercuspal position. Where further evaluation is required or where the intercuspal position is indefinite, models should be mounted to the retruded axis position without tooth contact. The main means of evaluating the existing intercuspal position is by reference to the retruded axis position as evidence to date would attest to the reproducibility and stability over time of this jaw relation. Such a comparison is possible, though not readily performed with a Dentatus articulator and practically the desirability of using the present intercuspal position may more often have to be made on the basis of clinical evidence.

Mounting the Casts

Mounting comprises two main steps.

- (a) Facebow registration and mounting of the upper cast.
- (b) Recording of the retruded axis position or intercuspal position and mounting of the lower cast.

The Intermaxillary Record

Where there are too few teeth to permit the ready orientation of upper and lower casts into the intercuspal or retruded axis position, particularly in free-end saddle cases, wax occlusal rims on acrylic or shellac bases will be required prior to recording jaw relationships. This will entail a further appointment.

1. Intercuspal position

The intercuspal position is not a mandibular border position and therefore eccentric pathways from the intercuspal position may not necessarily be related to mandibular border pathways. As mentioned previously, the face-bow registration orientates the centre of movement to the articulator for registrations of the retruded axis position and eccentric border movements and should, therefore only be regarded as a convenient means of mounting the upper cast when models are mounted to the intercuspal position. Further, because the intercuspal position does not relate to the path of terminal hinge closure, one cannot stop short or pass through this position on the articulator with accuracy. The record should be made with the teeth together. Frequently, upper and lower models can be accurately hand articulated prior to mounting the lower cast. A simple record of occlusal contacts in the mouth with shimstock or cellophane strip can be used as a check as to the accuracy of the mounted position.

2. The Retruded Axis position

The various methods and materials used in the recording of the retruded axis position are numerous and the method of choice will be dependent upon operator/instructor preference. However, at the very least the mounted position on the articulator should be compared to that of the patient (indicator tape or wax etc.) and where evidence of reproducibility is desirable, split-cast mountings should be used. Through the use of an arbitrary hinge axis, the possibility for error already exists. Such an error will be increased by using a thick rather than thin record. Consequently the retruded axis record should be as thin as possible and should not exceed 3 mm of hinge opening at the incisors.

IV. Facebow Registration

1. A point is marked 13 mm anterior from the posterior edge of the tragus, on a line joining the middle of the tragus and the outer canthus of the eye. This procedure is carried out on both left and right sides. It is also necessary to locate and mark the inferior border of the left orbit at the infra-orbital notch.
2. On the bite fork two sheets of wax are placed on the upper, one sheet on the lower side (alternatively, impression composition may be used). The wax should be of a rather hard quality in order to minimize deformation during registration.
3. The upper teeth should make sharp, but not deep imprints into the wax. Cusps should not come into direct contact with the bite-fork.
4. The upper cast is then replaced in the imprints of the record and the fit checked. Sometimes the wax has to be trimmed so that the cast can fit exactly without rocking.
5. The bite-fork is then relocated in the mouth and the face-bow attached. The condylar rods are adjusted so that they both touch the marks and have the same millimetre settings. The front locking nut is then tightened. It is usually convenient to have the patient stabilize the bite-fork with his thumbs during this stage.
6. The orbital pin is adjusted so that it touches the left infra-orbital notch, and locked in place.
7. The condylar rods are released and the face-bow removed from the patient.

V. Mounting Casts in the Articulator (Dentatus Type ARL & Dentatus Face-bow)

The potential for error exists in all stages of mounting casts in the articulator be they through articulator usage, record transfer, wax distortion or mounting plaster. These errors can be minimised but not eliminated and this fact should emphasize the need for care.

It is recommended that plaster is mixed with an anti-expansion* liquid for ALL mounting procedures.

*Anti-expansion liquid

The use of A-E-8 solution, in the ratio of 1:1 with water is recommended for mixing mounting plaster. When using A-E-8 solution, a somewhat thinner consistency of plaster can be used to advantage when closing the articulator members through the mounting plaster. The recommended formular is

Potassium sulphate	4%
Borax	0.4%
Alizarin S.	0.04%

Increasing the percentage of Borax will reduce the speed of set.

Mounting Upper Casts from a Face-bow Transfer

A. Preliminary basic setting of the articulator

1. Condylar spheres should be in the basic position and locked by tightening the condylar lock screws.
2. Both anterior stop screws must be tightened.
3. The condylar track angle and the condylar post angle are arbitrarily set at 30° and 15° respectively.
4. The incisal pin calibration is set at zero and the incisal table is set horizontally.
5. A mounting plate is firmly secured to the upper member, having been smeared with a thin coat of petroleum jelly.

B. Mounting the upper cast

1. Where recommended, the upper cast should have been modified for split-cast mounting by hand or with proprietary formers (to be preferred).
2. The base of the upper cast is keyed with heavy grooves.
3. The face-bow condylar rods are adjusted to the same reading on both sides such that they will lightly spring over the ends of the condylar axis.
4. The face-bow is lowered or raised by means of the anterior jack screw until the orbital pointer touches the orbital axis plane.
5. An adjustable cast support is attached to the lower member and adjusted such that it offers passive support to the face-bow fork.
6. The upper cast or the upper occlusal rim with its base-plate and cast is located onto the bite-fork. (NOTE. Where precise location is not possible the dentist should be informed. It may be necessary to retake the face-bow recording or, with a dentate cast, to retake the impression).
7. The base of the cast is moistened or, if keyed by hand for remount, separating medium applied, plaster is placed upon it and the upper member closed. (NOTE. Too thick a mix may displace the bite-fork.)
8. When the plaster is set, the mounting is removed and trimmed.

Mounting the Lower Cast from a Centric Relation Record

A. Basic setting of the articulator (MANDATORY)

1. The condylar spheres should be in the basic position and both anterior stop screws solidly tightened.
2. The condylar track angle and the condylar post angle are set at 30° and 15° respectively.
3. (i) Where the centric jaw relation record is taken with no increased vertical dimension the incisal pin is set at zero.
(ii) Where the centric jaw relation record is taken at an increased vertical dimension, it is practical to set the incisal pin at +5 mm.
4. The lower member of the articulator should be protected with vaseline or a piece of waxed paper (the PAPER MUST BE FREELY MOVABLE after the mounting plate has been attached).

B. Mounting the lower cast

1. Invert the articulator.
2. Using light pressure only, check that the upper and lower casts or occlusal rims fit accurately into the centric jaw relation record. Material touching areas of soft tissue should be cut away.
3. When satisfied with the accuracy of fit the centric jaw relationship record is fixed by cementing upper and lower bases of the casts together with wire, toothpicks etc.
4. It may sometimes be necessary to secure denture bases to their casts with sticky wax.
5. The lower base is moistened, mounting plaster added and the lower member closed through it, and gross excesses of plaster removed.
6. When the plaster is set, the mounting is removed to facilitate trimming.

Adjustment of the Inclination of the Condylar Track from the Protrusive Record

The condylar tracks of the articulator are adjusted in accordance with the sagittal condyle path inclination of the patient. This is done by means of a protruded record. Such a record should be obtained at 4-5 mm protrusion with a recording medium of wax-tin foil sandwich or plaster placed between the teeth.

1. The condylar posts are set at 15° , the condylar spheres should be unlocked by loosening the condylar lock screws. The incisal pin should be lifted before the setting is done.
2. The protrusive record is placed between upper and lower casts and checked for accuracy of fit.
3. Vertical pressure is exerted over the middle of the record. The condylar tracks are moved back and forth, one side after the other. The set screws are tightened when the condylar inclines are felt to be midway between a steeper and a flatter position, when the upper member is just about to move.

APPENDIX 6

DENTAL HEALTH EDUCATION

COMMUNICATION

From the first meeting with a patient, it is essential that effective communication be established between the operator and the patient.

The process of communication is one which will be covered in detail during your course. A feature of the process is that the message which is to be communicated ought to be capable of being understood by the receiver. When the operator is the generator of the message, and the patient is the receiver, and the message is a verbal one, for communication to be effective, it is necessary that the wording used be easily understood by the patient. Therefore, for most patients all technical jargon should be minimized, and any which must be used ought to be explained.

Patient Orientation

From the outset, the patient must be informed about the nature of the oral diagnosis and treatment planning process which will occupy the first appointments, and of the benefits likely to be gained by such appointments.

Patient Expectations

When a diagnosis has been established and a treatment plan has been established, these ought to be discussed with the patient. The treatment plan might have to be modified in the light of the patient's expectations and the patient's perceived needs. These should be fully discussed.

Treatment Plan

All items of the treatment plan must be explained to the patient, so that the patient understands what is involved, and in what order things are likely to happen to him/her.

Also the nature of the procedures, and the reason for their performance, must be explained.

The likely time that will be needed for completion of the treatment plan must be explained to the patient, including the number, length and timing of the appointments. This is very, very important since most patients' previous experiences of dental treatment, if any, lead them to anticipate that the time required will be short.

Dental Health Education for the Individual

The process of effecting behaviour modification in patients, so that they adopt favourable health related behaviour patterns, is a complicated process.

Unfortunately, the success in getting patients to change their behaviour is not related purely to the amount of knowledge which the individual patient possesses. In other words, telling a patient all about the interrelationship between dental plaque and dental diseases, is not likely by itself to result in the patient deciding to change his/her behaviour so that plaque control will be practised on a regular basis.

However, in the process of motivating patients, knowledge does play a role. So such knowledge as is required, must be communicated effectively and must be factually correct.

The First Year Course: Introduction to Dental Health and Dental Practice, will have equipped you adequately to explain to patients:

- (a) the role of plaque in oral disease
- (b) the methods of plaque control
- (c) the interrelationship of diet and dental disease
- (d) the prevention of oral disease.

However, as your course progresses, the foundations to your knowledge laid during the Monday afternoon course of last year, will be built upon.

The following headings indicate the general fields of knowledge which will be expanded, and which may prove helpful in explaining to patients their role in controlling disease.

The Role of Plaque as a Causative Agent in Dental Disease

Methods of plaque control - Patient
- Operator

Assessment of Plaque - Patient
Operator

diet and Dental Disease

Diet Control

Methods of Prevention

Role of Dental Personnel.

Thus, as your course progresses, it will be possible to select from the above, the most appropriate information to be communicated to patients.

1st February 1983

PROCEDURE CODES

0110*	Initial Patient Exam	3450	MB Root Resection	7100*	OS/OM Diagnostic Consultation
0120*	Emergency Exam	3451	DB Root Resection	7150*	MOS Consultation
0130*	Epidem. Exam	3452	P Root Resection	7200*	Tooth Extraction Intra-alveolar
0140*	Treatment Plan	3453	M Root Resection	7250*	Tooth Extraction Transalveolar
0150*	Re-evaluation	3454	D Root Resection	7270*	Elective Surg Rem Root/Tooth
0160*	Case Review	3460	Hemisection	7301*	Surg Rem Impacted Tooth Simple
0165*	Case Presentation	3470	Diodontic Implants	7302*	Surg Rem Impacted Tooth Mod'te
0170*	Prosthodontic Review	3480	Reimplantation	7303*	Surg Rem Impacted Tooth Diff
0180*	Recall/Evaluation	3490	Intentional Reimplantation	7350*	Post-extraction Haemorrhage
0190*	Final Examination	3960	Bleaching Non-vital Tooth	7360*	Dry Socket
0201*	Panelipse	3970	Bleaching Vital Tooth	7390*	Periapical Surgery
0202*	Oblique Lateral/Bimolar			7410*	Surgical Exploration
0211*	Bitewing	4210	P.E.S. External Bev	7430*	Excisional Biopsy Soft Tissue
0221*	Periapical, Bisected Angle	4211	P.E.S. Internal Bev	7440*	Excisional Biopsy Hard Tissue
0222*	Periapical, Paralleling Tech.	4212	P.E.S. Reposition Non-oss	7450*	Incisional Biopsy Soft Tissue
0223*	Periapical, Full Mouth	4213	P.E.S. Reposition Osseous	7460*	Incisional Biopsy Hard Tissue
0224*	Periapical, Endodontic	4214	P.E.S. Pre-restorative	7480*	Intra-oral Incision & Drainage
0231*	Occlusal, Upper Anterior	4240	P.C.S. Reattach Non-oss	7485*	Extra-oral Incision & Drainage
0232*	Occlusal, Upper Other	4241	P.C.S. Reattach Osseous	7500*	Treatment of Cyst
0233*	Occlusal, Lower	4242	P.C.S. Reattach Local Rec	7550*	Antral Surgery
0241*	Skull, Cephalometric	4243	P.C.S. Reattach Gen. Rec	7610*	Frenectomy — Labial
0242*	Skull, Other, Single View	4260	Hard Tissue Grafts	7620*	Frenectomy — Lingual
0243*	Skull, Other, Multiple	4270	Soft Tissue Grafts	7630*	Orthodontic Surgery
0251*	TMJ, Panelipse	4280	Perio-pulpal Non-S. Proc	7640*	Transplantation/Replantation
0252*	TMJ, Transpharyngeal	4290	Post-operative Care	7710*	Pre-prosth Surgery Soft Tissue
0253*	TMJ, Other	4342	Removal of Overhangs	7720*	Pre-prosth Surgery Hard Tissue
0261*	Sialography	4350	Polish Restorations	7730*	Pre-prosth Surgery Major
0262*	Tomography	4360	Sub-ra-ging. Scaling	7750*	Cryosurgery
0410*	Diagnostic Aspiration	4361	Sub-gingival Sealing	7800*	Trauma
0412*	Exfoliative Cytology	4362	Overhangs/Prostheses	7820*	Orthognathic Surgery
0414*	Patch Tests	4363	Root Planing	7840*	Temporo-mandibular Joint
0416*	Sampling for Microbiology	4370	Acute Gingivitis Emergency	7860*	Tumours
0418*	Urinalysis			7880*	Salivary Glands
0419*	Diagnostic Venepuncture	5110	Complete Mx Denture	7900*	Oral Mucosal Lesion
0460*	Pulp Vitality Tests	5120	Complete Md Denture	7930*	Management of Acute Infection
0470*	Study Casts	5130	Immediate Complete Mx Denture	7940*	Management of Facial Pain
0471*	Photographs	5140	Immediate Complete Md Denture	7950*	Management of Pericoronitis
0472*	Orthodontic Set of Photographs	5150	Immediate Partial Mx Denture	7960*	Management of TMJ Dysfunction
0500*	Isolation — Rubber Dam	5160	Immediate Partial Md Denture	7970*	Management of Oral Ulceration
0501*	Isolation Other	5170	Duplicate Mx Denture	7980*	Management of White Patch
0600*	Diagnostic Excavation	5180	Duplicate Md Denture		
0900*	Consultation Appointment	5230	Partial Mx Denture, Metal	8000*	Cephalometric Analysis
		5240	Partial Md Denture, Metal	8050*	Space Analysis
1000*	Caries Control — Stabilisation	5310	Immediate Complete Mx Overdent	8100*	Removable Appliance
1110*	Prophylaxis	5320	Immediate Complete Md Overdent	8110*	Adjustment of Removable Appliance
1220*	Trng in Prev Care — Routine	5330	Immediate Partial Mx Overdent	8120*	Adjustment to Clasp
1221*	Trng in Prev Care — Special	5340	Immediate Partial Md Overdent	8130*	Addition to Bite Plate
1222*	Trng in Prev Care — Handicap	5350	Complete Mx Overdenture	8140*	Cold Cure Repair of Spring
1231*	Topical Fluoride Solution	5360	Complete Md Overdenture	8150*	Repair of Appliance
1232*	Topical Fluoride Varnish	5370	Partial Mx Overdenture	8200*	Whip Spring
1233*	Topical Fluoride Gel	5380	Partial Md Overdenture	8240*	Functional Appliance
1234*	Topical Fluoride Rinse	5610*	Base Repair	8270*	Separation
1235*	Topical Fluoride Paste	5620	Tooth Addition	8300*	Bands
1236*	Topical Fluoride Other	5640*	Tooth Repair	8350*	Bonds
1310*	Dietary Planning	5680*	Clasp Repair	8400*	Space Maintainer
1330*	Oral Hygiene Instruction	5710	Reline Complete Mx Denture	8440*	Habit Deterrent
1350*	Fissure Sealant	5720	Reline Complete Md Denture	8470*	Retainer
		5730	Reline Partial Mx Denture	8475*	Positioner
		5740	Reline Partial Md Denture	8500*	Arch Wire Constructed
2110	Amalgam — Deciduous	5750	Rebase Complete Mx Denture	8510*	Arch Wire Fitted
2140	Amalgam — Permanent	5760	Rebase Complete Md Denture	8520*	Arch Wire Adjusted
2200	Silicate Restoration	5770	Rebase Partial Mx Denture	8530*	Arch Wire Tied In
2210	Glass Ionomer	5780	Rebase Partial Md Denture	8600*	Palatal Expansion (Slow)
2300	Acrylic or Plastic Restoration	5810	Transitional Mx Denture	8650*	Palatal Expansion (Rapid)
2310	Composite Resin Restoration	5820	Transitional Md Denture	8700*	Head Gear
2410	Gold Foil	5830	Transitional Partial Mx Dent	8800*	Soldering
2510	Direct Inlay — Gold	5840	Transitional Partial Md Dent	8850*	Welding
2520	Direct Full Occ Coverage	5910*	Transcut Neural Stimulation	8900*	Pericision
2610	Indirect Inlay — Porcelain	5920*	EMG	8950*	Stripping
2710	Indirect Inlay — Gold	5930*	MKG		
2720	Indirect Full Occ Coverage	5960	Prefabricated Attachments	9215*	Injection — Intra-articular
2940*	Temporary Restoration	5970	Dome Overdenture Abutment	9216*	Injection — Intralesional
2950*	Intermediate Restoration	5980	Post and Diaphragm	9217*	Injection — Intramuscular
				9218*	Injection — Intravenous
				9219*	Injection — Subcutaneous
3111*	Direct Pulp Cap Ca (OH)2	6020*	Temporary Crown	9220*	General Anaesthetic
3112*	Dir Pulp Cap Dycal/Procal/Life	6030	Porc Jacket Crown McLean/Sced	9230*	Relative Analgesia
3113*	Dir Pulp Cap Ledermix	6040	Porcelain Jacket Crown Al	9910*	Desensitizing Medicament
3114*	Dir Pulp Cap Pulpomixine	6050	Full Veneer Crown w. Facing	9940*	Occlusal Examination Clinical
3121*	Indirect Pulp Cap Ca(OH)2	6060	Porc Bonded Non-precious Crown	9941*	Occl Exam Mtd Casts — Simple
3122*	Indir Pulp Dycal/Procal/Life	6070	Porc Bonded Precious Crown	9942*	Occl Exam Mtd Casts — Complex
3123*	Indir Pulp Ledermix	6080	Partial Veneer Crown Gold	9950	Minor Occlusal Adjustment
3124*	Indir Pulp Pulpomixine	6090	Full Veneer Crown Gold	9951	Major Occlusal Equilibration
3201*	Pulpotomy — Vital Deciduous	6091	Full Veneer Crown Stainless St	9952	Minor Tooth Movement
3202*	Pulpotomy — Non-vital Deciduous	6092	Full Veneer Crown Nickel Chr	9953	Removable Occlusal Appliances
3203*	Pulpotomy — Vital Permanent	6261	Post & Core NC: Cast Gold Tapr	9954	Temporary Splints
3204*	Pulpotomy — Non-vital Permanent	6262	Post & Core NC: Cast Gold Parr	9955	Fixed Splints
3240	Recalcification — Perforations	6263	Post & Core NC: SS Parr Smooth	9956	Fixed Splints — Cemented
3250	Apexification	6264	Post & Core NC: Screw Retained	9957	Fixed Splints — Acid Etched
3300	Vital Root Canal Therapy	6265	Post & Core NC: Other	9958	Removable Splints
3305	Non-vital Root Canal Therapy	6510	Acid Etch Retained Veneer	9960	Feeding Plate — Active
3310	RCT Single Point Silver	6610	Acid Etch Retained Bridge	9961	Feeding Plate — Passive
3311	RCT Sectional Silver Point	6710	Retainer — Gold Full Veneer	9990*	Mock Examination
3312	RCT Single Point GP	6711	Retainer — Gold Partial Veneer	9991*	BDS Examination
3313	RCT Sectional Point Gp	6712	Retainer — Gold with Facing	9999*	Miscellaneous Service
3314	RCT Multiple Point Gp (Lat)	6714	Retainer — Porc. Fused Non-prec		
3315	RCT Multiple Point Gp (Vert)	6715	Retainer — Porc. Fused Precious		
3316	RCT Amalgam	6720	Temporary Bridge		
3317	RCT Combination	6810	Pontic — Gold Full		
		6811	Pontic — Gold Sanitary		
		6812	Pontic — Cemented Porc Facing		
		6813	Pontic — Resin Facing		
		6814	Pontic — Porc Fused Non-prec		
		6815	Pontic — Porc Fused Precious		

ACTIVITY CODES

1st February 1983

DRUGS CODES

01 Alkaline Phenol
 02 Amoxicillin
 03 Amphotericin
 04 Ampicillin
 05 Ascorbic Acid
 06 Aspirin
 07 Beclomethasone
 08 Benzocaine
 09 Benzylpenicillin
 10 Bioral
 11 Bonjela
 12 Brilliant Green
 13 Carbamazepine
 14 Carboxymethylcellulose
 15 Cephalexin
 16 Cephaloridine
 17 Cephradine
 18 Chloral
 19 Chloridiazepoxide
 20 Chlorhexidine
 21 Chlorhexidine Gluconate
 22 Chlorpheniramine
 23 Choline Salicylate
 24 Clindamycin
 25 Codeine & Paracetamol
 26 Co-trimoxazole
 27 Crystal Violet
 28 Depo-medrol
 29 Dihydrocodeine
 30 Dihydrocodeine & Paracetamol
 31 Diazepam
 32 Dologesic
 33 Ephedrine
 34 Erythromycin
 35 Fluocinolone
 36 Fluoride
 37 Formaldehyde
 38 Hydrocortisone
 39 Hydrogen Peroxide
 40 Idoxuridine
 41 Iodine
 42 Ledercort
 43 Lincomycin
 44 Mefenamic Acid
 45 Menthol & Benzoin
 46 Methylcellulose
 47 Metronidazole
 48 Miconazole
 49 Mouth Wash BPC
 50 Nitrazepam
 51 Nystatin
 52 Otrivin
 53 Panquil
 54 Paracetamol
 55 Penicillin V
 56 Pentazocine
 57 Promethazine
 58 Seclophen
 59 Sodium Chloride (Compound)
 60 Sodium Perborate
 61 Terramycin
 62 Tetracycline
 63 Thymol (Compound)
 64 Triamcinolone
 65 Triclofos
 66 Trimprazine
 67 Triplophen
 68 Vitamin B
 69 Zinc Sulphate

Thrd Digit

C — Capsule
 C — Cream
 E — Elixir
 G — Gel
 G — Glycerin
 I — Inhalation
 I — Injection
 L — Lozenge
 M — Mixture
 M — Mouth-bath
 M — Mouth-wash
 N — Nasal Drops
 O — Ointment
 P — Paint
 P — Paste
 S — Solution
 S — Solution Tablets
 T — Tablets

DEPARTMENT CODES

740 Conservative
 750 Oral Surgery
 752 Oral Radiology
 753 Primary Care
 760 Childrens
 770 Periodontology
 771 Hygiene
 780 Prosthetic

CLASS CODESCROWN AND BRIDGE

FF Fixed-Fixed
 FM Fixed-Movable
 CL Cantilever
 SC Spring Cantilever

ENDODONTICS

01 Hyperemia
 10 Acute Pulpitis
 20 Chron Hyperplastic
 21 Chronic Pulpitis
 30 Pulpal Degeneration
 31 External Resorption
 32 Internal Resorption
 33 Calcific Degeneration
 40 Necrosis
 50 Acute Apical Perio
 51 Bacterial
 52 Chemical
 53 Mechanical
 60 Acute AI Abscess
 70 Chronic AI Abscess
 80 Subacute AI Abscess
 90 Apical Radiolucency

OPERATIVE

First Character
 1-5 Black's Classification
 Second Character
 Accessory Retention
 A = Acid Etch
 C = Cemented Pin
 F = Friction Retained Pin
 S = Threaded Stabilok Pin
 T = Threaded TMS Pin

ORTHODONTICS

01 Simple
 02 Complex
 03 Other
 05 Removable
 07 Fixed
 08 Springs
 09 Screws
 10 Elastics
 11 Wire
 12 Localised
 14 Full Mouth/Arch
 16 Begg
 18 Edgewise (018)
 22 Edgewise (022)
 25 Edgewise (Straight Wire)
 26 Round
 27 Rectangular
 30 Meso-Distal Movement
 31 Retraction of Incisors
 32 Proclination of Incisors
 33 Bucco-Lingual Movement
 40 Anchorage
 41 Traction
 42 Orthopaedic
 43 Cervical
 44 Straight
 45 High Pull
 46 Combination
 47 Reverse
 48 Chin Cup
 50 Serial Extraction Programme
 51 Mixed Dentition Treatment

PERIODONTOLOGY

1 Mild
 2 Moderate
 3 Severe

PROSTHETIC DENTISTRY

1-4 Kennedy Classification

SURFACE CODESCROWN & BRIDGE

1-16 Unit

ENDODONTICS

0-5 Canals

OPERATIVE

B,D,I,L,M,O

ORTHODONTICS

U,L,B Upper, Lower, Both
 A,P Anterior, Posterior

PERIODONTOLOGY

01,05,09 Difficulty

RADIOLOGY

1-20 No of Films

STAGE CODES

01 Commence
 05 Incomplete/Temporary
 07 In Progress
 09 Periodic Review
 11 Preparation
 12 Lining
 13 Core
 14 Impression
 15 Model
 16 Wax
 17 Try In
 18 Insertion
 20 Open Drainage
 21 Diagnostic Length Determined
 22 Biomechanical Preparation
 23 Dressing
 24 Culture
 25 Root Filling
 30 Diagnostic Records
 31 Observation
 32 Treatment Plan
 33 Appliance Adjustment
 36 Retention
 37 Post Retention
 39 Repeat Treatment
 40 Pre-surgical
 41 Surgical Treatment
 42 Suture Removal
 43 Post-op Review
 44 Long-term OS Review
 50 Non-surgical Review
 51 Long-term OM Review
 60 Preliminary Impressions
 61 Preliminary Records
 62 Design
 63 Tooth Preparations
 64 Working Impression
 65 Survey Master Cast
 66 Try in Framework
 67 Altered Cast Impression
 68 Jaw Relationships
 69 Tooth Selection
 70 Flat Plane Try in
 71 Set Articulator
 72 Final Try in
 73 Check Record and Remount
 74 Insertion
 75 Adjustment
 76 Reline Impression
 77 Reline Insertion
 78 Rebase Impression and Jaw Rel
 79 Rebase Insertion
 85 Referred to Surgery
 86 Referred to Cons
 87 Referred to Perio
 88 Referred to Childrens
 89 Referred to Prosth
 90 Final Inspection
 95 Change Procedure
 96 Remake
 97 Recall
 98 Cancel
 99 Complete

COMMENTS

01 Good Patient Management
 02 Good Technique
 03 Good Comprehension
 11 Theoretical Knowledge Deficient
 12 Unprepared Set-up
 13 Inadequate Anaesthesia
 16 Inadequate Debridement
 17 Unnecessary Tissue Trauma
 18 Poor Surgical Judgement
 19 Inadequate Post-operative Inst
 20 Poor Patient Management
 21 Poor Technique
 22 Poor Comprehension
 23 Unprofessional Attitude
 24 Does Not Accept Instruction
 25 Improper Dress
 26 Inadequate Records
 27 Required Counselling
 28 Staff Member Finished Work
 29 Poorly Prepared Lab Procedures
 31 Poorly Prep Clinic Procedures
 32 Remade — No Credit
 33 Recall — Evaluation
 34 Recall — Adjustment
 35 Poor Use of Time
 36 Does Not Know Limitations
 37 Late for Appointment
 38 Poor Liason Paraclinical Staff
 40 Difficult Patient
 41 Poor Case Assessment
 42 Poor LA Technique
 43 Poor Surgical Technique
 44 Poor Surgical Decorum
 50 Transfer/Loan

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