THE UNIVERSITY OF
SYDNEY

DENTAL THERAPIST UTILIZATION IN AN ADULT DENTAL SERVICE IN AUSTRALIA

P.J. Naughton, B.D.S. (Syd.)
R.N. McKegg, B.D.S. (N.Z.)

A Thesis submitted in partial
requirement for the
DIPLOMA OF PUBLIC HEALTH DENTISTRY

Department of Preventive Dentistry
Faculty of Dentistry
University of Sydney
1973

TABLE OF CONTENTS

INTRODUCTION

"The type of dental education that we are providing, all over the world, and the kind of dental practice that results, may provide an acceptable solution for the control of oral disease for the priviledged few. It has been a complete failure when translated in terms of total populations. There are obvious reasons for this. The amount of accumulated dental disease is such that if our goal is to restore optimum function to the entire population, the professional manpower available now, or expected in the forseeable future, will be totally inadequate to accomplish the task. A basic reshaping of dental health care systems is necessary, to increase availability of services, to hold down costs and up-grade quality." (1)

Although Professor Sciaky was referring to the Israel position in his comment, the situation is clearly universal. When Western communities are examined, a similar picture emerges. Sir John Walsh has told us ".....The present method of providing dental care has been operating for over 100 years throughout the world, training dentists to go out into the communities and treat the dentally sick. In the richest society the world has ever known, that is, the west coast of America, this system has only provided care for 50% of that society's people. This means that after

a hundred years, our present system has totally failed to bring dental care to everyone." (2)

Harold Hillenbrand, speaking in 1968 as President of the American Dental Association, stated "....We are not now meeting the dental needs of the 1960's, much less are we prepared to meet the needs of the 1970's. We have now in many areas, a shortage of dental manpower. We are utilizing our auxilliary personnel in a wasteful, confusing and sometimes illegal manner. And finally, we talk of need for dental care versus demand for dental care, but I suggest that if the barriers of ignorance and economic want are eliminated, there is no difference between what is needed and what is wanted,.....the pressures which are building in our society from Government, from socio-economic forces, and from the emerging demand of the citizenery for health as a fundamental right, will not be contained by vague promises. The health professions must act." (3)

Recent evidence, from a study of answers contained in a community dental care delivery survey in Australia, gives evidence of Hillenbrand's foresight and judgement.

Of 600 people who gave suggestions to improve dental services, 80% gave answers which indicated that they required, free

or subsidized dental care for children and adults and improvements in dental health education. (4)

The United Kingdom Department of Health and Social Security Annual Report for 1969, showed that 49.3% of payments to dentists related to scaling and routine conservative procedures. Since payments are directly proportional to time spent on the operations involved, therefore it is fair to assume that about half the practitioners' time was spent on procedures that could, and to some extent already are, being carried out by auxilliary personnel with about two years training. Corroborative details concerning the time spent by dentists on routine procedures is contained in the article written by Martens and Meskin, entitled "The current character of practice and the expectations of dental students", showing clearly that 50% of a practitioners' time is spent in conservative and periodontal procedures. (5) The amount of time spent on these routine matters strictly limits the practitioners use of higher skills taught him as an undergraduate, in the fields of Orthodontia, Periodontia and Oral Surgery and must lead to a low satisfaction level for a highly educated person.

Perhaps the fact that the production of dental undergraduates has not even kept pace with population growth may be due to this low level of satisfaction within the existing ranks of practitioners. (6)

Davies, Kruger and Homan [7] point out in an extensive survey of the dental status of children in Queensland, that in 1972 the existing dental services, both private and public, were able to provide less than half of the treatment required for caries alone. The position in regards to other conditions was far worse. Such a position is not unique to the State of Queensland and is indicative of the urgent need for a different approach to dental health care delivery.

Davies et al. further point out that "..... our profession faces a serious challenge to provide more dental health services for more people at a cost that is realistically related to the essential needs and priorities of daily life. Those who want but cannot afford dental care will increase the pressure for Government involvement. The profession can meet this challenge by increasing the application of preventive measures and by reorganising the present method of delivering dental services. Emphasis must be given to the delivery of services by a team, under the direction and supervision of a dentist who is a University graduate."

Sciaky [1] has commented that "Dental care is expensive, the geographical distribution of dentists very uneven, and much less than half the population avails itself of their services. The Dentist, a highly educated, a thoroughly skilled expert, spends about two-thirds of his professional life implementing routine procedures that could be carried out very competently by skilled

auxiliaries. Dental care, as delivered in single practices, is the most inefficient, and wasteful use of dental manpower that one could imagine. It may even be called a non-system."

Sciaky [8] has also said that "....there is no doubt whatsoever in my mind, that within less than two decades, a great deal of the repetitive types of dental treatment in our profession will be performed by auxiliaries of one type or another and for a number of very good reasons.

1. Even on superficial investigation, comparison between accumulated needs and dental manpower available, now or in the forseeable future, shows that putting quantitative responsibility for dental treatment on professionals, is doomed to failure.

2. Secondly, dental treatment, when available, is too expensive for most of the people, even in developed countries."

One may surmise that, in the future, dentists will work mostly in group practices, which will bear a resemblance to the physicians' work in hospitals. This arrangement will make for more efficiency and less stress for the dentist, and permit a better utilization of auxiliary personnel.

A dental team approach, is a desirable method of dental care delivery. The term "teamwork" means co-operation between the

Dentist, chairside assistant, technician and therapists. "The latter three participants in the team should, of course, be regarded as assistants to the team leader - the dentist - and not his substitutes." (9)

Acceptance of the team approach to dental care would help us as it has the medical profession, where "it has long been recognised that the delegation of duties by physicians and surgeons to their auxiliaries is in a more advanced stage professionally and legally, than in Dentistry. The success of this effort is assessed by public and professional acceptance of physician-nurse co-operation, for example, in rendering a better service to the patient." (3)

"The most important point about teamwork with dental auxiliaries is the influence they have on the quality of the work of the Dentist." (10)

Firstly, he is able to utilize the skills and knowledge learnt by him as an undergraduate, (and post-graduate) student, since he has reliable, well-trained personnel in his team to whom he can delegate those tasks which make up a considerable part of modern dentistry, but do not need professional training to accomplish. Working under these conditions must give rise to a heightened sense of achievement for the dentist and enable a wider spread of his dental skills.

A dentist who finds himself the leader of a team of people trained to work in various fields of dentistry, under his supervision, and to his prescription, must face prospects of an improvement in status. Practice will be a more interesting and stimulating experience; the patients will receive a better planned and more advanced type of treatment. (6)

If we assume that group practice, team work and the use of auxiliaries with extended duties, will be the rule within the next two decades, and, if we are concerned with the total oral health of the community, then we must also be prepared to accept dental auxiliaries as a specific group within our dental organisation. To utilize them to the greatest advantage, we should consider the feasibility of conjoint training facilities for auxiliaries and Dentists - thus enabling the concept of TEAMWORK to be basic to all dental manpower training.

The basic endeavour of this paper is to propose a method of utilization of dental therapists in an Adult Dental Service in Australia. Such a scheme may appear to many as a radical idea, an idea threatening to the practice of dentistry in Australia. Such is not our intention; our motivation is one of stimulation of the speciality of dentistry, in such a way as to provide a better oral health and well being of the entire community, than is presently

the case, while lifting the burden from the already over-worked private practitioner. The Adult Dental Service, as outlined in this paper, is proposed as a model to achieve the goal of better dental health, initially through Government agency. But it is also intended to serve as a model for possible adoption by private practitioners, for the writers believe that teamwork dentistry with expanded-duty auxiliaries, supervised by University trained dentists, is the best method by which the community can achieve dental health.

Donaldson [11] also sees the "....Dentist as the leader of an efficient and economically attractive dental health team; --- the team will be preventively orientated and capable of better serving increased numbers of patients. There may be relatively fewer dentists as population increases, and their training will better fit them for this changing role. They will be specialists in general dentistry, and their status and their rewards, occupational and otherwise, will improve."

Harold Hillenbrand, described by Dr. H. Freihofer at the F.D.I. General Assembly in 1973 as "one of the most outstanding dentists of the twentieth century", asked in 1967, "When are we, as professionals, going to assume our full responsibilities by delegating to others, the tasks which do not require any measure of

professional competence, thus enabling us to serve our patient better, and give them the time and understanding which will motivate the patient to pursue a lifetime of good dental health?" (12)

In conclusion, for those who perhaps feel that the utilization of dental therapists in Australia, as proposed in this paper, is a move too radical in concept, the words of Donald W. Gullet may be worthwhile perusing. He said (13) "We live in an age where too often what was considered socialism yesterday, is liberalism today, and even becomes conservatism tomorrow."

1. PRESENT ADULT DENTAL SERVICES

In 1973, Australians of fifteen years of age or more, were able to receive dental care from a number of sources. Their entitlement to one form of service or another depended solely upon their ability to pay for it, unless they belonged to the Armed Forces, or had done so previously and suffered injury as a result of that service. Rural Australians shared one dentist amongst up to 5000 people, while urban Australians shared one dentist amongst 2800 people. The forms taken by adult dental services are as follows:

1.1 Private Practitioner Services

In December 1971, there were 5265 dentists listed on the State Dental Registers. Of these, 18% were not practising in Australia, 15% were employed in Government, University or Armed Forces, which left a total private practitioner work force of 3,413. (14)

These services, of high standard both ethical and practising, were and still are, established to service the demand exacted by the public. Of this total number of dentists, 3252 were in general practice and 161 in specialist practice.

1.2 Government Services

1.2.1 Armed Forces

One hundred and four dentists were employed in all branches of the Australian Armed Forces in 1971, providing comprehensive

dental services to all members of the Armed Forces. Where members were on overseas posting with their families, treatment was provided for them and their dependants by those Armed Forces dentists who were posted with the overseas units.

1.2.2 Commonwealth and State Government

Of the 491 dentists employed in Commonwealth or State Government Services in 1971, 388 were employed treating adults. Most of the services were provided through a system of large Dental hospitals, with small outstation clinics to serve other areas of need. Access to treatment in these establishments is decided by a means test applied to each patient. In other words, if a patient has above a certain determined income, he is directed to a private practitioner, while if his income is below the line, he is eligible for treatment at a very low cost, in these Government Dental Clinics. Access, spatial and temporal, is generally poor. A very high standard of work is maintained and a high ratio of patients/dentists/year is maintained. The average number of patients treated per dentist per year in the Government Dental Services in Australia in 1971 was 900.

The Repatriation Department provides either treatment or complete subsidy of private treatment (at approved rates), for all eligible persons. Eligibility is restricted to those ex-servicemen and women who have received, a war service disability, a service

pension, and certain widows and dependants of deceased ex-servicemen. 2922 private practitioners were contracted as local dental officers to the Repatriation Department in 1971, agreeing to provide treatment to any recipient of Repatriation proviledges at the scale of fees published by the Department.

1.3 Company and Insurance Services

In 1971, an estimated [14] 78,000 Australians received dental care from a wide variety of privately run company clinics, and such organisations as Legacy, Manchester Unity, Hibernian Society and Friendly Societies. Large companies, e.g. Broken Hill Mines or Electrolytic Zinc, employed dentists to treat their personnel who paid considerably less for the services provided, than at a private surgery.

1.4 Comment

Studies in 1968 have shown up interesting facts about utilization of dental services, including three that deserve attention.

1. Virtually all Australians suffer from dental disease at some time during their lives.

2. Not much above 30% of Australians seek regular dental care.

3. Hardly more than 20% of the requirements of children are met. [15]

Although it was stated in Victoria [16] that in 1969 a reasonable ratio of dentists for the population as a whole should be 1 to every 2500 people, studies of areas where comprehensive service is given to patients, show that dentists can cope with 750 [1] and 900 [2] adults. [17]

The figure would probably be close to 1100 for private practice due to an increased number of hours worked by the private sector. [18] In the light of this information, it can be seen that of the 2500 people sharing one dentist, if comprehensive care were to be attempted by him for all of these, some 1400-1600 would miss out altogether.

Recent community dental health surveys [19] indicate a demand for dental care from approximately 50% of the population. This would be in line with trends in other western societies, as shown by similar studies in the United States, where demand increased from a 20-25% usage of services in 1930 [20] to a figure of 42% in 1956. [21]

Later indications are that this demand, which studies have shown are closely linked to education and income [20] will rise rapidly as the numbers of graduates from National tertiary educational institutes increase, and the number of families with

increased incomes rises.

The problems then posed by the statistics quoted above are:

1. How is the gap between demand and need to be filled?

2. How is the existing manpower, with it's small annual increases, going to cope with greatly increased demand for services?

2. DENTAL THERAPISTS

2.1 Types and Definitions

A review of the literature on the subject of dental auxiliaries shows that many attempts have been made to determine a uniform description of these groups of personnel. Rationalization of name, legal status, job scope, education and training, and professional acceptance has been attempted, and a pattern of classification of Dental Auxiliaries has emerged. (22)

In this paper we are concerned with the Dental Therapist, a type of dental auxiliary that the writers consider as a person with the skills of a New Zealand School Dental Nurse, amalgamated with the United States concept of a Dental Hygienist, and with some additional aspects of the South Australian and Western Australian

Dental Therapist. It is interesting to note that on an international level, the Dental Hygienist and the New Zealand Dental Nurse now have almost equally high acceptance. (23) Australia has shown an acceptance of the latter type of auxiliary, with training schools established in Tasmania, South Australia and Western Australia and plans for similar establishments in New South Wales, Victoria and Queensland are well advanced.

We are looking at a Dental Auxiliary who has the characteristics, objectives and roles of the New Zealand Dental Nurse, with some further training enabling them to function in an adult, rather than a school-age sphere and the effective utilisation of such an auxiliary in an adult Dental Service in Australia. This auxiliary should be orientated in both the traditional therapeutic role, but possess greater skills in the preventive sphere of dental care.

Although the emphasis herein is directed towards such therapists as defined above, the whole range of auxiliary personnel utilized in the delivery of dental care are pertinent in varying degrees, to the paper. The important roles that are the responsibility of the Dental Technician, Chairside Assistant and the Receptionist/ Clerk are an integral part of any dental care delivery system that has been, or yet may be, devised.

2.2 School Dental Nurse/Therapist

2.2.1 Accepted Roles

In 1968, 12 countries were utilising this category of dental auxiliary: (23)

Malaysia, Ceylon, Hong Kong, Indonesia,
Singapore, Australia, United Kingdom,
New Zealand, Thailand, Zambia, Ghana,
Burma.

Seven of these countries have their own training schools.

The most important aspects of the role of the Dental Nurse are that she is confined to the treatment of children to eighteen years of age, and is employed only by a Government service. Her intra-oral duties include regular examination, prophylaxis and filling of deciduous and permanent teeth, the extraction of both deciduous and permanent teeth under local anaesthetic and the radiographic examination of the teeth and supporting structures. In Ceylon and the United Kingdom, extraction is confined to the deciduous teeth, and in Australia, Indonesia, Malaysia, Thailand and New Zealand, treatment is confined to children under fourteen years of age. In Hong Kong, children under eighteen years are treated by the School Dental Nurse, who has to spend one clinical post-training year before gaining qualification.

The functions of the School Dental Nurse are regulated in Australia, New Zealand and the United Kingdom by legislation which defines the scope of operation and the types of employment.(23)

In New Zealand in 1973, the Dental Council gave approval for Dental Nurses to be employed in certain trial situations, by the Division of Dental Health, to treat certain categories of adult patients. This step, coming 50 years exactly after the first Dental Nurses graduated in New Zealand, is a step of utmost significance to the delivery of Dental Care.

2.2.3 The Skills Required by a Dental Therapist Working in an Adult Treatment Service

The skills taught to the undergraduate Dental Therapist in New Zealand would appear at this stage, to be the ones most likely to be taught to the Australian therapists. In fact, those Australian Therapists already trained and under training in Tasmania, have skills very similar to the New Zealand Dental Nurse.

These disciplines, with the hours spent learning them, are as follows:

History and Ethics	10 hours
Materia Medica	20 hours
Chairside Assisting	20 hours
Dental Anatomy and Histology	105 hours

General Nursing	50 hours
Operative Dentistry	2370 hours
General Pathology) Bacteriology and Histology)	20 hours
General Anatomy and Physiology	20 hours
Handwork and Models	60 hours
Posters	30 hours
Instrument Care and Use	20 hours
Records	30 hours
Child Welfare and Management	150 hours
Dental Surgery and Pathology	100 hours
Preventive Dentistry	153 hours
Orthodontics	12 hours
Organisation and Administration	60 hours
Local Anaesthesia	120 hours (24)

The teaching of these disciplines and the knowledge acquired in learning them are spread over the course of a two year intensive training programme.

It can be seen from the hourly figures quoted above that a very heavy emphasis is placed on the acquisition of mechanical skills. It is often argued, that any mechanical approach by an operator to the problem of dental caries, only treats the effects

of the disease and not cures it. The action taken by the operator in providing a mechanical reparative process, places this process in a position of prime importance in the minds of the patient and the operator. The situation must be altered and preference given to preventive measures, placing the reparative process below the relief of pain and prevention in a priority list. The authors of this paper feel that the tremendous backlog of untreated decay in Australia must not be overlooked. While fully agreeing with the aims of a completely preventive orientated service, the constant reminder of the necessity for mechanical skills to relieve pain and to treat the effects of caries, tends to distort the preventive picture.

However, at the risk of attempting to appear all things to all men, we would suggest that the emphasis of the Dental Therapist's course as presently taught in New Zealand and elsewhere, must be modified, to produce a completely preventively-orientated auxiliary, with sufficient mechanical skills to enable her to complete those restorative procedures that will be asked of her, in a preventive/relief of pain service.

It is vital to the success of dental teamwork, to the long term satisfaction of the Therapist, as well as to the dental health of the nation, not to mention the economic management of public dental services, that the Therapist be trained to think primarily of prevention and health and secondly of disease and correction. If an

attitude of indifference or of doubt towards prevention exists in the Therapist, her services will, in the long run, fail to influence the incidence of dental disease. New Zealand shows well enough, how fifty years of plugging millions of amalgam restorations, has completely failed to alter the incidence of dental caries in that country. (25)

The hierarchy in a service which employs Therapists, must be confident of the Therapist's preventive approach, and be supportive of it. Those who provide the funds for the service, must see the value of a course of treatment involving preventive measures as readily as they see value in units of restorative work completed.

Economists who advise services are commonly more aware of the long term monetary value of preventive measures, as opposed to curative. (26)

Recently, the Minister for Health for Australia, Dr. D.N. Everingham, was asked "..In what major ways would your Health Policy differ from what we have known so far?" The Minister stated in reply "....I think because of this emphasis on things other than acute illness, with shifting the emphasis to health and to prevention -----the difference is that people would start to see health as "avoiding illness", rather than waiting 'till something happens and then trying to cure it."

2.4 Roles. Current and Possible Extensions

The importance of including (extended) dental care as a part of a national health programme has been recognised by the World Health Organisation since 1959. The planning of such programmes is an integral part of Public Health Dentistry, and requires consideration of factors such as the dental needs of a community, resources available to meet those needs, and the objectives to be achieved in meeting those needs.

This area of objectives to be achieved is irrevocably tied to the available manpower and resources that may be applied to meet the total dental needs of any community. For example, in some under-developed countries, manpower and resource scarcity have led to a dental programme being strictly curtailed to one of relief of pain and extractions only. (28)

The almost universally felt shortage of manpower has led many countries to consider the use of auxiliary personnel, within the framework of the profession, to facilitate dental health programmes. Perhaps the most documented occurrence in this field has been the New Zealand School Dental Nurse system, a system from which, many important lessons are to be gained. In addition, the United Kingdom, Canada (1964), Australia (1968) and the United States (1968) have shown increasing tendencies to investigate and utilize auxiliary personnel in an attempt to achieve the objectives of community dental health.

The auxiliary personnel at present utilized in various countries have a wide ranging level of responsibility and acceptance, and it is towards the operative auxiliary, as exemplified by the New Zealand School Dental Nurse, that our interest is now directed. This type of auxiliary is well trained to carry out responsibly, a wide range of duties that are, in many places, still held to be the strict preserve of the professional dentist.

It is perhaps pertinent to recall here that the New Zealand School Dental Nurse programme arose from the realisation in 1920 that young male adults of military age had accumulated such enormous dental need backlogs, that the profession in New Zealand at the time, could see no way, using professional resources only, of reducing these needs, far less control the incremental additions to the dental needs of an increasing population.

At the present time in Australia, therapists are employed in South Australia, Tasmania, Western Australia and the Australian Capital Territory, with provision for introduction into New South Wales, Victoria and Queensland, by 1974. Therapists are operative auxiliaries, permitted to do certain operations within the oral cavities of children under professional supervision. In addition the Armed Forces are utilizing Hygienists, trained by the Forces, in a limited fashion.

The desire to achieve the perhaps impossible goal of 100% dental fitness for the entire community is demonstratably not possible under present conditions, nor are future projections of professional graduate numbers likely to help achieve this objective. Economists have shown the financial advantage of delegation of certain tasks to suitably trained auxiliaries. (26)

2.5 Discussion on the Role of the Therapist

The recent attempt of the United States Government to provide free dentistry for indigent people in the State of New York, proved so costly, using existing professional manpower, that the service became retrenched and drew the following comment:

"...were large proportions of auxiliaries employed with expanded functions.....duplication of facilities and waste of scarce manpower could be avoided and larger volume of dental services could be made available at reduced costs." (29)

More recently in New Zealand, Hixon said "....I would hope the profession and the Department of Health would again examine the possibility of permitting dentists to employ some of the 100 or so School Dental Nurses who retire each year. .....after a very short training programme, they could qualify as registered Dental Nurses to be employed to do scaling and whatever routine restorative work the practitioner would designate. This would free the employing dentist from some of the more mundane work and allow more time, not

only for periodontics and orthodontics, but also for oral medicine, bridge work and prosthetics. In other words, there would be greater flexibility and more time to practise the full spectrum of dentistry. (30)

The cost of delivery of dental care has always worried Governments and no more telling argument can be advanced for the use of Dental Therapists. Shermann L. Cox has stated "....The production of enough dentists to meet the predicted demands for dental care would be an extremely expensive solution----perhaps the cost would be higher than society would be prepared to pay. If the demand for dental services is to be met (not mentioning the need) it now seems imperative that dentists increase their productivity through more efficient and effective use of dental auxiliaries. (31)

Sciaky has said that the cost of training three therapists, four chairside assistants and two office clerks would not equal the cost of training one dentist, and that a team comprising one dentist and the above personnel could care for 6000 children and be transposed into any adult situation. (8)

Such a team would be less expensive to train than two dentists and yet be capable of caring for more people than two dentists, working on their own.

Fluoridation is continuing in Australia, and increasing numbers of people are living with its beneficial effects. One of the noticeable effects it does have is to change the pattern of carious attack on the teeth, reducing the effects on some surfaces by 67% - 88% while easier to approach surfaces, e.g., the occlusal surfaces, show a lesser affinity for protection, and carious attack of these surfaces is reduced in 16 year olds, by only 34%. (32)

Donaldson (11) sums up the implication of this factor by saying "....I do not doubt that the continuous and heavy burden of the repair of dental caries, is beginning to lift from the profession. As the total amount of caries decreases, ...the pattern of tooth surface involvement changes, leaving simpler tasks which can be well done by operating auxiliaries."

However, even though the tasks remaining in the reparative field will be simpler, the total lead will not greatly reduce, due to the great backlog of untreated decay existing at the present time. A major study of Dental Practice in the fluoridated and non-fluoridated cities in the U.S.A., showed no greatly significant differences in the time spent in separate dental disciplines by dentists in either situation. (33)

"The purpose of the auxiliary is to undertake the frequently occurring operations, thereby releasing the dentist from the performance of routine operations, so that he may concentrate on the

more complex and less common diagnostic procedures and treatments.(27)

The Dental Therapist in an adult service will play a vital role, in making available expensive professional ability and time to more people and to allow a greater spread of services and a more complete individual treatment.

Those who see therapists as a threat to their existence or as a serious danger to dental health, advance three major arguments against their use.

The first concerns the concepts of demand and need. Some dentists maintain that as dentists are meeting the demand for their services, there is no manpower shortage, e.g., "I submit it is of relatively little use to know that there are 800,000,000 unfilled cavities in the U.S.A. (need) unless we know how many of these we will be called upon to restore (demand). Manpower requirements, present and future can only be based on what dentistry will be required to do." (34)

To anyone concerned with the total health of a population, such argument is fallacious, especially when the factors of income and education as motivators in seeking dental help are examined. These show a direct relationship to demand for care and do not suggest that although a poorly educated, low-income earner does

not demand a great deal of care, that he does not want it. (35)

The second argument advanced against the use of therapists, is that of professional shortages. Some dentists argue that instead of training auxilaries, we should train more dentists to meet needs.

The answer here involves two areas of discussion. The first lies in the field of economics, and the statements already made at the beginning of this chapter deal effectively with the pro-view. The second lies in the area of the dentists' status. Hixon has stated, "...by utilizing dental nurses, I have no doubt that the relief from some of the burden of restorative work should give more dentists more time to enjoy the full spectrum of dentistry, and in turn assume a more professional posture." (30) A team leader inevitably appears as a stronger person that does a sole operator, and the skills and knowledge of the dentist, applied partly through a team of auxiliaries, raises the status of the profession as a whole.

Regarding skills, Sullen has said, "...In this same regard ....six to eight years of difficult and expensive higher education are really not needed to perform some of the more routine procedures involved in dental practice. (Many members of the dental profession) .....do not view the assignment of less complicated and routine tasks as a threat to their professional stature but rather as an

opportunity to free their time to provide services to more patients and perhaps more comprehensive services to patients whom they are already treating." (36)

In addition, authors such as Karl R. Koerner (37) and Morton A. Fisher (38) have written concerning the increased status of a dentist as a team leader.

The need for an increase in status of the profession to attract more undergraduates is a possible factor facing the profession at this time.

The third argument often advanced is one often heard, viz., 'we aim to provide the finest care for all, and second class service to none'.

The rebuttal is simple. The so-called first class service for all has never been achieved and from population growth studies compared to dental graduate rates (30), it can be seen that unless massive amounts of money are spent in new dental schools and promotion of the profession, it never will. This first class service for all is an Utopian concept, which studies of dental practice (39) show, will fail to materialize.

Finally, to quote from the 1970 Jacques Parisot Foundation Lecture given by Sir John Charles [40] "If an effective attempt is to be made to provide some form of care to 100% of the population, and this is undoubtedly the ultimate objective, the professionals must be spread very thin indeed, and in addition there must be the most carefully organised use of their time, energies and skills.

This can be done only through the extensive use of auxiliaries.

3. ORGANIZATION AND OBJECTIVES

3.1 Introduction.

"It is essential (if the Dental Profession is to meet the demands and needs of the present and the future) that the professionals must be spread very thin indeed, and in addition there must be the most carefully organised use of their time, energies and skills." [40] Australian dentistry has, for many generations, been practised by dentists operating their own one-man surgeries. Studies [14] of dental manpower show that 76% of dentists work alone in private practice, some of them without a chairside assistant.

To expect a solo practitioner to re-organise his practice to cope with auxiliary operation, is asking too much of him, without affording him training in the use of auxiliaries, and without showing him how a dentist can operate successfully, a therapist-staffed clinic.

Government, preventively oriented, dentalunits, should be established, utilizing one dentist, three therapists, four chairside assistants and two clerks, one of whom has special Health Office Management training. Sciaky has suggested (8) that such a team could cope with all the dental needs of 6000 children or be transposed to an adult treatment service.

Such a unit, closely cost-supervised and controlled, should provide a model for private practitioners. It must illustrate the economics and efficiency of the team situation.

It is felt that the unit should be sited in close proximity to general health services, and the provision of space for a dental clinic within the community Health Centre would be most suitable. One of the internationally formulated principles concerning dental care states that "..schoolchildren should, whenever possible, be treated within their school grounds, and the remainder of the community should have their dental needs met at the Community Health Centre." (27)

Having stated the proposed size and location of such a unit, let us look at the organisation necessary to maintain it and others, built and staffed by Government, in those areas where baseline information suggests dental needs are not being met. It is contended that these units should be situated only in such areas, and that conflict with the private sector be avoided, as the great majority of Australia's adult dental needs, will be met in the future by a restructured and vital private practitioner service. These units should show the way, and conflict must be avoided. However, low cost Government dental services must be provided to ~~dill~~ meet unmet needs and to ease the load on the private sector, while they do not compete with it. The public should have the choice between the two types of service. There must be no means test applied to any patient who seeks treatment in Government Service Clinics.

3.2 Organisation

A line diagram of personnel and their relationships within an Asult Dental Health Service, is represented in Figure 2. The Director of the Service, as mentioned in Figure 2, should be appointed on a regional basis, the total number of regions depending upon the results of verification studies establishing needs.

However, at present, from recent Community and World Health Organisation surveys [18], it would appear that in any year 50% of Australia's population go without dental services. To establish a service to involve 50% of Australia's population over fourteen years of age, would be to ignore the developments that are taking place within the private practitioner sphere. However, as an adult service would take some time to become established, trends can be watched and short term goals corrected from time to time.

As this paper concerns Therapists, it is towards this group of personnel that we turn our attention.

The therapists would work at either a Community Health Centre, or at a base hospital Dental Health Clinic. Each Community Dental Health Centre would represent one unit of operation and consist of:

1. One Dental Officer.
2. Three Therapists.
3. Four Chairside Assistants.
4. One Office Manager.
5. One Clerk. [8]

One of the three Therapists would be a senior Therapist. The Matrix organisation of each community health centre is represented in Figure 3.

The Hospital Dental Clinic would have five therapists attached to it, as both the Hospital Unit Dental Officer and the Registrar would be engaged in clinical work. Again, one of the Therapists would be a senior therapist. The position of the Registrar and his hospital Dental Health Clinic can be seen in Figure 2, along with the relative position of the Community Dental Health Centres.

The work of the Therapists within their units, would be to ensure that in providing treatment, adequate preventive measures are taken. Tests done with disclosing solutions or perhaps more empirical tests such as Woods test for Streptococcus Mutans (41) could be used as methods of determining a patients' plaque control. Patients who received a preventive course of treatment would benefit financially by their decision. It is suggested that all preventive measures, undertaken by Therapists and dental officers, should be free of charge to the patient. Those patients who joined a preventive programme would have their mouths cleaned and shown the benefits of oral hygiene by the Therapist before any permanent restorative work was undertaken.

By following this line of operation, the Therapist and the patient become aware of the primary importance of prevention as opposed to conservation.

Each Therapist would work in a four handed, low seated surgery with a chairside assistant. These surgeries must be discreet enough to ensure privacy during treatment, for the patient and the operator, and yet be efficiently designed and arranged to reduce costs of operation, maintenance and establishment.

All equipment should be standardised throughout Australia, so that Therapists could be employed in any location without re-training.

The types of work the Therapist would undertake in such a service are as follows:

Prophylaxis.

Scaling.

Topical applications of preventive solutions and mixtures.

Use of disclosing solutions.

Class 1,2,3 and 5 amalgam silicate and composite restorations.

Take impressions for mouth guards and study casts.

Place fissure sealants.

Provide oral hygiene instruction.

Do plaque control tests.

Maintain accurate detailed patient records.

Pour and trim plaster and stone models as necessary.

Each Regional Operation would have a Therapist Inspector whose duties would be to maintain close liaison with the Therapists. She would be responsible for collecting data from the patients' records, kept by the Therapists, and also for ensuring the Therapists maintained determined, personal standards of presentation and record keeping. The Unit Dental Officer would be directly responsible to both the patients and the Registrar for the standard of work done by the Therapists. Other personnel in the Adult Dental Health Service would be responsible for research, staffing, logistics, finance and therapist management. A list of duties for all personnel in the service is seen in Appendix 1.

3.3 Objectives

A recent community survey carried out in Australia shows that approximately 50% of Australians receive dental care. (42)

Assuming that the 3.6 million children in Australia will, in future, receive care from the Australian School Dental Service, a population of 8.9 million is left, of whom figures suggest, 4.45 million do not receive care.

3.3.1 "The major objective of a Government Adult Dental Service, is to provide for the future needs of those who now receive no care".

Manpower studies and overseas experience have shown that to attempt this by using dentists is impossible.[27,39,43,44] (2)

Therefore it is, in the opinion of the most learned men of the dental profession around the world, only possible to provide for community dental needs by using well trained auxiliaries, to emphasize the need for dental public health and do the simple mechanical tasks, presently being done by dentists.

It can be seen that immediately a decision is made to provide a health service to cope with need, the problems of costs and manpower arise and to equate these three areas of 'service and need', 'professional manpower' and 'manageable costs', we must look outside existing systems.

It is felt that sufficient experimental justification for using Therapists has been undertaken, and has proved that systems based on the utilization of this type of person, will go a long way towards marrying the above three, seemingly incompatible factors.

So, inextricably intertwined with the primary objective stated above, is the need to organise a service which uses Therapists, to act under the control and supervision of dentists, to spread the dentists' knowledge as widely as possible and to keep costs within reasonable boundaries.

If the primary objective stated above is accepted, it leads then to the second objective, which is:

3.3.2 "To establish a dental health service which, by the use of dental therapists, acting under the direction and control of dentists, has the capacity to meet expected future dental needs, and further, by it's actions, serve to limit the incidence and spread of dental disease."

Discussion of Objectives

1. Research: (a) Before a service is founded, research on methods of delivering care and community needs must be established.

(b) Following the establishment of a service, along the lines suggested in this paper, constant research is necessary to maintain information of the following variables:

1) Community use of service

2) Patient acceptance of treatments.

3) Operator satisfaction.

4) Cost efficiency of the service.

5) Changing patterns of community dental disease.

6) Changing nature of operator education.

7) Changing nature of services provided.

3.4 Nature of Services

A Government Dental Service must attempt to achieve a significant decrease in the amount of disease present in the community. It must attempt to prevent the disease first, and secondly treat its effects. It should be a service that the community wants to use, which means, at least three things:

1. It must be accessible to everyone.
2. Be acceptable to those who use it.
3. Act to educate the community in dental health.

3.4.1 Accessibility

Service clinics should be sited in areas where research has shown that need exists, and no services, or insufficient private services, exist. The clinics should be easily accessible, close to public transport systems, and have good vehicle parking space, either incorporated or close by. Manpower studies [39, 45] have shown that where the money is, there goeth dentistry, and the converse exists and is equally true. [46]

The suggestion that 'free dental services placed in economically depressed areas will immediately attract business', is a doubtful one. Studies such as those conducted by Gordon C. Vidner in the United States [47] show that even where large groups of individuals are fully covered by insurance for their dental requirements, utilization seldom reaches 70%. However, it is

believed that there are many factors acting in these circumstances, and not the least are the habit inducing examinations and treatments carried out by a School Dental Service. In the United States and Australia where few school services exist, there is little chance that the habit of going to the dentist will be formed where economic pressures give bias to other matters. Studies of the numbers of young adults who attend regularly, show the differences that do exist between New Zealand (where a nationwide school dental service covering 98% of that nation's children exists) and other countries. (48) In New Zealand, the ratio of Filled to Decayed Missing and Filled teeth of young adults attending dentists was 72%, compared with a figure of 26% in Australia. (49)

A survey recently conducted in New South Wales shows that utilization does depend on transport and parking facilities being readily available to dental services. (45) The acceptance of the establishment of community health centres in Australia, should give an excellent opportunity to study utilization figures and the centres in Belconnen, A.C.T., should provide a basis for investigation.

Where large groups of workers are gathered in industrial complexes, attempts should be made to evaluate likely utilization of services placed amongst them. Satellite suburbs and dormitory

towns should be closely studies in relation to their socio-economic level and therefore the likelihood of private dental services being established.

3.4.2 Acceptability

One of the intentions of this paper is to present a case for a preventively oriented service, where willing patients (after relief of pain treatment which is a first function of the service) receive preventive treatment before any permanent restorative work is done. These patients would receive a diagnostic service from the dental officer in charge, and following this, preventive treatment coupled with oral hygiene instruction. After acceptance of these measures, and by co-operating and maintaining personal oral hygiene, the patient would finally receive any permanent restorations necessary.

To estimate patient acceptance of such a service before it begins is a hazardous affair, but studies of preventive practice have been made and the results are encouraging to the concept presented here. In one such study carried out in Sydney [59] a number of patients (used to a regular treatment programme) opted out from the experimental preventive programme for a variety of reasons (left the area, didn't finish the programme), leaving over 60% of the original recipients to finish the course. All of these

accepted the preventive measures and the nett result was a significant decrease in their annual caries increments.

A study such as this suggests that people interested in their own teeth will accept a preventive programme. The relief of pain offered by the service is self explanatory, and a percentage of the population will continue to avail themselves of this aspect alone. Until the Australian School Dental Service has dealt with a complete generation of Australian children, no significant change in the habits of Australians towards their oral health, can be expected.

However, fluoridation of water supplies, coupled with a preventive programme provided by dental services can reduce annual caries increments to as low as 0.67 new lesions per annum per person. (42)

3.4.3 Public Dental Health Service

Studies of dental situations around the world have shown that in the best possible situations, with regard to manpower availability and accessibility, dentistry has been largely involved in therapeutic conservation and pain relief. The time left, in this situation, for dental public health is too little to be of real value and while great changes in the ratio of Filled to Decayed Missing and Filled Teeth have been made, little change has

been made to the total Decayed, Missing and Filled teeth per person.

The Therapist, using chairside instruction of the patients in the measures necessary to achieve good oral health, will help to correct the balance, and do for dentistry what the baby health and community nurses have done for medicine generally.(50)

4. ROLES OF THE DENTAL OFFICER IN AN ADULT DENTAL SERVICE

In an Adult Dental Service, as proposed by the writers of this paper, we are endeavouring to establish the concept of Dental Health delivery through the logical placement of Dental Health teams. These are located in such situations within the community that they may render an effective dental service to those adult community members who are not, for whatever reason, being reached by the presently existing dental services of our country.

Our basic concept is supplementary to existing services, with the desired aim of stretching our dental manpower resources in an attempt to meet the dental needs of the adult Australian.

4.1 The concept of teamwork in dentistry is becoming well-known to the profession, with its attendant increased productivity

and 'job satisfaction', not to mention the lifting of the physical and mental load from the individual practitioner. It is reasonable to assume that this teamwork approach will be progressively adopted by the profession, until it becomes the norm. As Sciaky puts it, "....One may surmise that --- the future dentist will work mostly in group practices. This will bear a resemblance to the physicians parallel work in hospitals. This set up will make for more efficiency and less stress on the dentist and permit a better utilization of auxiliary personnel." (8)

A dentist directing a team of dental personnel works under less stress, leaving him fitter and in a better condition to work, and most importantly enabling him to reach a higher standard of achievement. The dentist can exercise more fully the skills he has learned during his training, and it is the conviction of the writers that the benefits of an increased efficiency, at less physical and mental cost to the practitioner, are felt most in the area where they are needed, that is, in the community, whose dental needs the profession should meet.

When we look to the dentist in such a Dental Service as is proposed herein, we are looking at a fully professional person, well trained, not only in the practice of the arts and skills of dentistry, but also in the area of auxiliary management; a

professional who has realised that with delegation of responsibility he----"could spend more of his energy and skills in endeavours for which he alone had been trained and in which he preferred to become occupied." (51) There are some areas where the dentist is not skilful, by the very nature of his education however, and attention must be directed to alter this position. For example, in working with auxiliaries, a dentist will need to acquire the management skills necessary to select, employ, train, communicate with, protect depend upon and manage such persons.

The achievement of 'management by objective' will assume great importance to the dentist, and can be gained through additions to the dental curriculum, or more easily by delegation to highly trained auxiliary personnel, adept in the art of management. The Armed Forces, for many years, have utilized trained personnel in organisational roles, at lower than officer status, and such personnel are envisaged as Managerial Clerks in the proposed Adult Dental Service.

The dentist must still undertake altered educational programmes to adapt to working in a team situation, to benefit himself and the Services. Such programmes as the Dental Auxiliary Utilization Programmes. (31) common in the United States, spring to

mind as a logical method of training dental undergraduates of the future, as well as the possible re-training of graduates who wish to work in an Adult Dental Service. "The United States Public Health Service, in 1956, initiated six pilot programmes for utilizing dental assistants to determine the feasibility of teaching dental students how to utilize trained dental assistants effectively. The success of these six programmes and their potential for alleviating some of the dental needs of the nation, led Congress in 1961 to appropriate specific funds for the establishment of Dental Auxiliary Training programmes in this country's schools of Dentistry. These programmes were sufficiently successful to become established as part of the curricula in all dental schools."(31)

4.2 So successful were the Dental Auxiliary Utilization programmes that, by 1969, approximately 25,000 United States practising dentists had had this experience during their education. Cox states further that "..it may be hoped that the programmes of Dental Auxiliary Utilization will be directed ------ to the total team concept of using all auxiliaries, the dental assistant, the dental hygienist and the dental technician."

Sciaky puts the point neatly when he says "..If they are expedted to work together efficiently, why not learn together, work together, know what to expect from each other, and also respect each other." (8)

It would seem logical that if our profession shows a responsibility for the oral health of the community, then dental auxiliaries should be included as a specific group within our organisation, and a unified system of training together must facilitate the 'team' concept to the overall advantage of the community.

The dental practitioner so far in our discussion, has emerged as a well-trained professional, who, through the added skills gained in a programme of Dental Auxiliary Utilization, has now achieved a less physically and mentally tiring approach to his chosen profession, an approach with mutual benefits to himself and his aim of achieving dental care for the community.

As such he will be employed in the proposed Adult Dental Service as the head of the dental care delivery team, initially in a Community Dental Health Centre, with prospects of progression to the position of Registrar in charge of up to three or more similar centres, and further upwards to the ultimate position of Director of Adult Dental Health Services.

As a controller of a dental health team of eleven people, the dentist will find himself as "..leader of a team of people trained to work in various fields of dentistry under his supervision and to his prescription, (and) will face prospects of an improvement in

status of his profession. Practise will be a more interesting and stimulating experience and not so physically exhausting. The patients should also receive a better planned and more advanced type of treatment." (6)

Recruitment of dentists to an Adult Dental Service raises the question of conditions of service which must be attractive to the young professional, as well as to older graduates who may wish to extend their expertise more widely and effectively than may at present be possible. To establish an effective Adult Dental Service we must be able to offer dentists the highest level of self realization. They must be able to grasp a sense of achievement, have a sense of responsibility and know that they are aiming at high performance goals. (52)

To enable the attainment of self realization, the Adult Dental Service will need to offer dentists satisfaction with regard to security, social position and self esteem. The writers feel that security would be built into such a scheme as they propose (with Governmental backing), social position is integral with the group associations found in the practise of dentistry, and self esteem would naturally flow from regular promotions and adequate recompense for services. An indication of salary level for dentists in the Adult Dental Service can perhaps be gauged by comparison to

salaries of Dental and Medical Officers employed in the Armed Forces, ...ere salaries range from $9,000 to $20,000 per annum.

When it is remembered that the Australian Government Policy is to institute free tertiary education, beginning in 1974, it may possibly be conjectured that a 'bonding' system could be established, whereby graduating dentists would spend one or two years in Government Service, such as the proposed Adult Dental Service. If conditions are attractive, it may also be conjectured that a percentage, hopefully high, of these dentists, would elect to stay with the service.

The proposed Adult Dental Service put forward by the authors is meant primarily to be a trial, and as such it is felt that trial centres could be instituted. Placement of these dental centres would necessarily be attempted as a result of a 'needs' survey, so that maximum advantage would be gained by experimentation. These outlets for the proposed Adult Dental Service would then serve a twofold purpose.

a) They would serve as a model for private practitioners to observe and assess. From this process of evaluation many and varied constructive criticisms could be expected - and these could be of great importance in any required modifications.

b) They would also help to clarify the 'wants' of the community. The profession has tended to dictate to the community as to just what they require in the dental field. More understanding of

patient requirements will necessarily benefit the community and also the profession.

It has been stated that the private practitioner could assess such a service as is herein proposed by observation of 'model' units set up in various locations. Just what would a dentist see in these units?

A previous section in this paper outlines the organisational composition of our proposed Adult Dental Service. Figure 5 shows the effect of chairside assistance alone, on the workload of a dentist in a team situation. Since we have designed our service to have a preventive orientation, and to utilize fully expanded-duty therapists, we have allotted the following times to carry out essential functions:

1. For dental health education and topical application of SnF_2 — 25 minutes
2. For initial diagnosis — 10 - 15 minutes
3. For completion of restoration — 15 - 20 minutes.

It has also been assessed that a yearly total of forty weeks at 40 hours per week is the norm for a practising dentist, giving a working figure of 1600 surgery hours per year per operator for our dental service. Appendix B shows that for 4800

patients, a dentist would spend his time evenly divided between diagnosis/treatment planning, and elective procedures. This would, we maintain, present a dentist with a situation more closely related to the proper utilization of his skills and knowledge.

4.3 Specialists

Trends in the population growth and the pattern of dental care suggest that increases in the number of specialists in dentistry may be inadequate to meet further needs. "Facts and Figures, 1972" shows that specialists of all types comprised 3.7% of the total dentist manpower in Australia. Although there is a greater need than demand now, for Orthodontists, the demand is increasing at a steady rate. The retention of teeth due to fluoridation, as well as the increase in the numbers of elderly persons, should have a profound impact on the requirements for Oral Pathology, Surgery, Periodontal, Endodontic and Prosthetic services, an impact which would seem to ensure increased demands for such services. The need for public health dentists already exceeds the supply and the development of new governmental programmes will result in even more critical shortages of personnel with a background in administrative dentistry. (53)

Experience has shown that dentists often perform some services in the specialists' domain. They would have more time for such elective pursuits in the Adult Service outlined herein, and operations in the fields of oral surgery and periodontal

surgery might be performed from choice. It is the experience of the writers that the development of undergraduate learned skills, in these disciplines, is of decided advantage where there is no, or perhaps only remote, specialist support for the practitioner.

The need for greater emphasis in dental schools and during continuing education processes, on the treatment of periodontal disease, simple malocclusions and uncomplicated surgical procedures is felt to be important. Young and Striffler [53] state "....The bulk of oral health care has been the responsibility of the general practitioner, and it appears that it will remain so."

Best use must be made of available specialist services in present and future dental care delivery, if we are to improve the dental health of the community. Access to specialists of all types must therefore be an integral part of any proposed dental delivery system.

Initially, specialists may be utilized on a referral basis, as is now the case in the Australian Armed Forces. The ultimate aim must, however, be to provide sufficient specialists within the service, to not only help in improving dental health, but also provide a further avenue for advancement for the dental graduate working in an Adult Dental Service.

5. TRAINING

The additional training of therapists, who have been employed in the Australian School Dental Service, provides them with the knowledge and skills necessary to assist dentists in their provision of care for adults and is a matter, at this stage, of a certain amount of conjecture.

However, there is sufficient information concerning the skills and knowledge they will need, for a course to be planned and a trial to be attempted. The conjecture at this stage is largely limited to the time it will take to impart this ability.

Craig [54] has said that three weeks intensive training would probably be adequate to equip an experienced operator with the skills necessary, to use high speed dental equipment.

The categories of necessary disciplines to teach Therapists for work in an Adult Dental Service are:

a. Preventive Dentistry

b. Operative Dentistry and four-handed concepts.

c. Periodontal training (scaling and prophylaxis)

d. Impression Technique

e. Equipment maintenance.

f. Radiography

g. Dental materials

h. Sociology and motivation

i. Objectives of an Adult Service

It has been suggested in this paper that the therapists who enter a retraining course, will have spent a minimum of three years working in the Australian School Dental Service. It is further suggested here that the intake of therapists to such a course, be limited to eight. This would mean that four, four-handed operatories, plus a seminar room would provide sufficient facilities for the programme.

The authors further state, that this programme should be conducted within an established University Dental Faculty. Facilities and patients are normally available, as well as the skilled teaching abilities necessary for such a programme. It is envisaged that the staffing requirements for this retraining process may amount to one full time dentist, assisted by a part time dentist, together with four full time chairside assistants. Funds for the programme will need to be specifically appropriated by the Government.

A period of eight to ten weeks may be necessary for this programme, but emphasis must be placed upon the need for the course to be intensive and as short as possible.

There are many women in the community, who, having the responsibility of children, find themselves unable to return to work. Married women, previously employed as therapists in the School

Service, who wish to retrain for work in the Adult Service should be encouraged to do so, and this means, amongst other variables, two things:

1. The retraining course should operate over as short a period as possible, and
2. The hours of employment in an Adult Service should be compatible with the therapists' family responsibilities, while the service should afford the care to the community, it is intended it should.

The four handed operatories necessary to train the therapists could also be used in a Dental Faculty, to enable the supervised training of dental undergraduates in low seated working concepts. The facilities would receive greatest utilization in such a location and maximum benefit would be gained from them. At present in Australia, there are no University facilities for training dental undergraduates in four handed concepts, and this serious lack could be remedied at the same time as facilities were provided for retraining therapists.

It is suggested that a retraining programme, based on an intake of eight therapists, at a Dental Faculty, be established, and that a trial should begin to establish and evaluate the best possible methods of doing this. The trial must be conducted within a University Dental Faculty. The accent of the course must be

primarily prevention, while not forgetting the necessary operative skills needed to assist the preventive work, and familiarize the therapist with high speed equipment.

Sciaky has said "....If we also assume that group practise, team work and the use of auxiliaries with extended duties, will be the rule within the next 20 years, then the training of those auxiliaries will have to take place within our schools, together with that of our dental students; if our graduates will delegate some of the routine work to these auxiliaries, they will have, whilst students, to learn to work with them, as a team, at school, all the time.

Teaching students to treat patients, conditions them to consider disease as normal, treatment as the solution. This approach has been shown to be a failure. Helping students learn that their responsibility is to keep the patient healthy, makes them, by necessity, aware that prevention.....is essential." (1)

"Dentistry's future is in the hands of our educators and dental organisations. We need training programmes to teach us how to use our personnel." (55)

To summarise

1. Retraining programmes for Therapists should be held within a University Faculty of Dentistry.

2. Course curricula must provide sufficient content to equip the therapist to treat, on a dentists' prescription, and acting as part of a dental care team, adults aged 14 years and over.

3. Courses should be as intensive and as short as possible.

4. The establishment of such a course within the Faculty of Dentistry will enable benefits to be gained by dental students, therapists and, of course, dentistry and public dental health.

6. COSTING ASPECTS OF AN ADULT DENTAL HEALTH SERVICE

6.1 Introduction

It has been frequently stated in this paper, that the proposals contained herein, should provide the basis for a dental service that would enable scarce dental manpower to provide effective care over a far greater section of the Australian community, than currently is the case. However, if this concept is to be effective, the service must achieve a number of things. These are:

1. Reduction of the incidence of dental disease.
2. Provision of high quality care.
3. Enable those who, at this stage cannot afford what they need, to have that need met.
4. Achievement of satisfaction of output for both operators, professional and non-professional, and patients.

In items 2,3, and 4, above, cost control is of great significance. Without careful budgeting and appraisal of the service, it could easily become too expensive to provide care for those who presently can't afford it.

One of the criteria by which success is judged, is customer satisfaction, which means in this case, ensuring that patients using the service feel certain of the value they have received for their time and money input.

Another output which must result is operator satisfaction, and this means, amongst other equally important items, adequate remuneration.

The service must be designed to provide preventive education and treatment for those target populations who presently receive none. The design must be such that, after a period of years when the primary objectives have been satisfied and a treatment coverage of the target population effected, those members of the private sector of the profession who wish to, may operate similar establishments. The Government clinics should provide operative models for the private sector of the profession.

To examine the cost of establishing a hospital base clinic, with a Registrar in charge, and a series of community clinics, the cost of a Community Dental Health Centre is a basic unit. To obtain costings of Hospital clinics, costs of employing additional staff such as Registrars, Technicians, extra therapists, etc., can simply be added to the Community Centre's basic cost. The space needed to house a basic unit which would care for up to 5000 people is estimated at 1400 square feet (see Appendix C.). Such a centre would comprise four surgeries, an X-ray room and Recovery room, a waiting room and foyer, a gallery, an office, staff room, change room and staff and public toilet facilities. Specifications for the

surgeries are contained in Appendix D. Sterilization facilities would be contained at either end of the gallery and consist of a sink with sterilizer alongside. Waste and linen bins would be kept beneath the sink.

6.2 The following costs are suggested for the establishment of such a unit:

1. Building of size and design as in Appendix C, built of timber fibro on concrete floors at $12/square foot:	$16,800
2. Fittings and Floor coverings	7,000
3. X-ray and development unit	1,250
4. Surgery costs at $3,364/surgery	13,456
	$38,506

Such a building would be able to be removed to another area, if the target population in the area where the unit was originally sited, changed and rendered the service unnecessary.

Salary levels and material costs are largely a matter for speculation at this stage of the project, but a guesstimate would be:

6.3 Salaries

Dental Officer	$15,000
Senior Therapist (5 year)	4,800
Therapist (3 year)	4,500
Therapist (1 year)	4,200
Office manager	5,000
Clerk	3,000
Chairside Assistants	
1 x senior	3,600
2 x Assisants @ 3,400 D.	6,800
1 x junior @ 3,200 D.	3,200
Cleaning contract	2,500
SALARY TOTAL	$53,100

B.	Materials per annum	4,500
C.	Light, heat and phone	1,500
D.	Printing	800
E.	Depreciation/Maintenance	4,000
F.	Miscellaneous	2,000
	TOTAL COST	65,900

On the basis of the estimates given above, some reasonable comparisons can be drawn.

If the figure of 5000 patients per year treated is established and proved by operation, then:

1. The cost per patient per year: $13.18

   This can be compared to:

2. Cost of Repatriation services per person per year (1971) $33.00

3. Cost of all present dental services per person per year (1971) $17.50

It can be seen that (without the cost of prosthetic technical services included) the proposed centre could provide services at a greatly reduced cost when compared with present Repatriation services.

A charge to the patient of $15 per person per year should cover all the expected costs and in the form of an insurance permium, may appear to be a reasonable premium to the patient. In the future in Australia, all children will be treated at the Government's expense, leaving only the adults in each household to pay for their own treatment.

The treatment received at the unit by an individual could be "relief of pain and preventive" services only, but those patients who opted into the system would, in effect, be totally cared for under the preventive programme.

7. THE EXTENSION OF THE THERAPISTS TO PRIVATE PRACTICE

Innovations in the field of dentistry have to be adopted into private practice, before their effects are felt by the majority of dental patients. Private practitioners in Australia account for three-quarters of the dental work force, and presumably therefore, 75% or more of the dentistry done.

One of the problems facing communities and the dental profession, in many countries, is that of the illegal practitioner. Some of dentistry's mechanical skills, for example, the making of dentures, are skills that can be acquired with little training. However, the rationale for treatment, differential diagnosis, and the comprehension of the patients' total needs, are things which must be included in every dental treatment, if the patient's quality of life is to be protected, enhanced or restored.

Fears that Therapists may resort to illegal and improper practice, are, in many cases, the underlying reasons for sectional opposition inside the dental profession to the utilization of these auxiliaries.

It is not simply the fear of opposition on an economic basis, but rather it is fear of a greatly depressed and even non-existant quality of care for the patients, if insufficiently trained personnel were to treat the public directly.

How can the valuable services of an auxiliary best be integrated into private practice?

The factors to be concerned with are:

1. Wages of auxiliaries
2. Illegal practice
3. Therapist training costs.

7.1 Wages

It can be assumed that a number of private practitioners presently want the services of an operating auxiliary in their practices. As the productivity of those private practices employing therapists increases, so the demand for the therapists will increase, from other members of the private sector. It is obvious that the Government service which trains these girls, must have first claim upon the graduate therapist. After leaving the School Service and being retrained to use four handed high speed operatories, the therapist should serve a minimal period within the Government service before being free to seek employment in the private sector. However, provision should be made for a therapist to pay for her own retraining course. In this position, are envisaged those therapists who have left the Government service because of marriage, and have reached the stage where they are freed from 24-hour responsibilities to their children, but unable to work Government Service hours. (Government services could be scheduled to avail itself of these people, however.)

Private practitioners may well wish to employ therapists on a part-time basis, and this form of employment would suit many married women. Those who cannot pay for their retraining course, must undertake to work in a Government service for one year.

To act as a deterrent against possible competition between Government and private sectors, it is suggested here, that private practitioners employing therapists should be allowed, as a taxation deduction, the maximum salary scale paid to senior therapists in the Government service. Bonuses would not be an allowable taxation deduction for the dentist.

7.2 Illegal Practice

Legislation should be framed and enacted to protect the public from possible malpractise by therapists. It should also protect therapists in their employment and their scope of duties. The following points should be taken into consideration for future possible legislation:

a) Therapists can be employed only by:

   1. Government
   2. A registered dentist.

b) All therapists must be registered, and must apply annually for a licensing certificate. Each such application must be accompanied by a reference from a registered dentist.

c) Therapists' duties must be clearly delineated in the legislation.

d) A therapist who does not have an advanced certificate from an accredited training institution may not be registered.

e) The dentist or the Director of the service employing a therapist will be legally responsible for the work undertaken by the therapist.

7.3 Training Costs

This subject is one which affects all trained health personnel. (A graduate of any one of Australia's five dental schools, may seek employment anywhere he so desires, providing he is registered and has not contracted himself to bursary conditions). The authors of this paper feel that with respect to therapists, certain terms of employment should be insisted upon.

Following graduation from basic training, a therapist should be required to spend a minimum of three years employed in the school service. After these three years, a suitable therapist will be permitted to enter a retraining programme, to equip her for service in the Government Adult Dental Service, or for employment in private practice. This three year period would ensure a fair return to the community, of the expense of training a therapist.

The dental graduate, although lying outside the scope of this paper, should expect to provide some community service after graduation, if only because of his training being, in the largest part, of considerable cost to the State. Current moves are to reduce the present five year dental course to four years. It is suggested that dental graduates should spend one intern or residency year in a Government service before registration, the year being spent in a hospital clinical situation receiving instruction in auxiliary utilization and management. This year's service would have to be mandatory before registration and would provide Government services with guaranteed continuity of dental personnel and also be of great value to the new graduate. Present curricula at dental schools in Australia give no training in the use of auxiliary personnel. As mentioned elsewhere in this paper, all dental schools in the U.S.A., include this type of training in their undergraduate curricula. The best of the United States' programmes are those ones which teach auxiliary utilization by involving the undergraduate dentist in a clinical situation. During this training, each undergraduate has a chairside assistant who is trained to demonstrate to him, the methods of utilization.(55)

With an adult, hospital oriented, service, as discussed in this paper, an ideal opportunity is presented for training Australian dentists in this field, while they return in the form of their service, value to the community which trained them.

SUMMARY

In 1973, Australians of 15 years of age or more were able to receive dental care from a number of sources. Their entitlement to services depended solely upon their ability to pay for it, unless they belonged to the Armed Forces, or had done so previously and suffered injury, as a result of that service.

Fifteen per cent of the total number of dentists registered in Australia in December 1971 were employed by Government, University or Armed Forces dental services; 18% were not practising in Australia; 67% were engaged in private practice of dentistry.(14)

Virtually all Australians suffer from dental disease at some time during their lives.

Not much above 30% of Australians seek regular dental care.

Hardly more than 20% of the requirements of children are met.(15)

One third of all Australians are edentulous in one or both jaws by the age of 44.(58)

Recent community dental health surveys, indicate a demand for dental care from approximately 50% of the population. (19) Later indications are that this demand, which studies have shown are closely linked with education and income levels, will rise rapidly as the number of graduates from National tertiary educational institutes increase, and the number of families with increased income rises.

How is the gap between demand and need to be filled and how is the existing manpower, with its small annual increases, going to cope with greatly increased demand for services, let alone tackle the problem of total community dental needs?

This paper postulates, that by utilizing dental therapists, the solution to the above questions would be, in the large part, discovered.

The employment of therapists in a dental team would provide additional personnel with the (hopefully) proper training, for preventive measures to be applied to individual patients on a regular basis. The therapists will also be the arm by which dentists can further spread dental health education amongst community groups and individuals.

It is postulated that by the institution of preventive measures and dental health education, significant impact can be made on community dental health. Dentists operating alone, have not, and cannot in the future, be expected to measurably reduce community dental disease below the level they have currently achieved.

Therapists exist in many countries and are used generally in Government School Dental Services to provide dental care for children. (23)

Australia has accepted the principles of the use of therapists in this field. Therapists' training, which takes an average of two years, teaches a limited range of dental skills for which fully professional training is unnecessary.

For therapists to be employed in an adult dental service, some short term retraining will be necessary. However, the importance of the type of training the therapists receive at both undergraduate and post-graduate level, is of great importance.

It is vital to the success of dental teamwork, the long term satisfaction of the therapist, as well as the dental health of the nation, not to mention the economic management of public dental services, that the therapist be trained to think primarily of

prevention and health, and secondly of disease and correction.

"It is essential that the professionals must be spread very thin indeed, and in addition there must be the most carefully organised use of their time, energies and skills." (40)

A simple system is presented herein and trials to test some of the unknown factors inherent in it, is suggested.

Dental care delivered through base hospitals and community clinics, operated by dental teams, comprised of:

One dentist

Three therapists

Four chairside assistants

One office manager,

One clerk,

is the authors' suggested system to reshape and enlarge the quantity of dental care delivered in Australia, whilst retaining the essential quality of that care.

Inherent in this proposal are a number of unknowns.

1. Will traditionally trained dentists delegate routine procedures to a therapist? Will some retraining of the dentists be sufficient, or will we have to take a new look at the way we train our dentists?

2. For how long does a therapist have to be retrained, to equip her with the necessary skills to treat adults?
3. What dental needs do communities, especially those presently without dental services, have?
4. Is the concept of a 'dental team' viable?
5. If the barrier of cost to dental care is completely or partially removed, what usage will dental services have?
6. Should a dentist, trained a public expense, be required to give one years' State service immediately following graduation?
7. Will therapists show a similar responsibility to the community, as general trained nurses have exhibited?

It is felt by the authors of this paper, that the answers to these questions will be found only in a fully researched and evaluated trial. Such a trial should encompass the following points:

A. As traditionally, the bulk of dental services in Australia have been provided by private practitioners, it is felt, that any innovations in this field, should it be possible, be provided with the guidance and valuable experience of the Australian Dental Association. Hence in the process of an evaluation trial situation, it is suggested that two clinics be established by the Government, one of which should be operated and evaluated by the Government and the other by the Australian Dental Association. These clinics should be established in areas

of population where there are insufficient dental care services.

B. A training programme for therapists should be established at a University Dental School, to train the therapists for service in these clinics.

C. Research, to provide, amongst other information, base line community data before the clinics begin operations; to evaluate the services the clinics offer; to evaluate public usage of the clinics; to evaluate the efficiency of the team work in the clinics, and the job satisfaction of the operators, must be established.

D. Training should be provided for thecontrolling dentists, in the utilization of auxiliary personnel.

E. The trial period should extend over not less than five years, to enable fair evaluation of the proposals.

F. During the trial, it is anticipated that more than one retraining course for therapists will be necessary, due to some therapists trained in the first course, leaving the trial programme, and this will give adequate opportunity to evaluate the retraining course.

G. The facilities needed to retrain the therapists should be used by the Dental Faculty where they are established, for assessment of training dental undergraduates in four handed operations and the concept of a team approach to dentistry.

H. The trial clinics, whatever financial charges they impose on the patients, should have a fee structure that discriminates against curative dentistry, and in favour of prevention.

I. The authorities controlling the clinics must be prepared to accept "whole mouth completions" and "services provided to relieve pain" as units of work done, rather than numbers of fillings. The bias from curative services towards prevention must be established at controlling levels for preventive services to be adopted widely.

CONCLUSIONS

Now is the time to plan, implement and evaluate a system that will provide dental care for the whole population; one that holds down costs and yet retains essential quality.

It is suggested here, that in Australia, a pilot project consisting of a Government operated clinic and a privately operated clinic, employing dental teams in the manner suggested in this paper, should be established in two separate areas of Australia, where there are at present, insufficient dental services for the population. A two year evaluation period should be worked by both units, before final decisions affecting the units' size and mode of operation are taken.

It is hoped that the Australian Dental Association would accept responsibility for the maintenance and organization, evaluation of the private clinic while the Government controlled the other.

Results gained from such a two year study would assist in the preparation of legislation, and the knowledge gained from the evaluation of both clinics would benefit the community and Dentistry and should point the way to dental services for the future.

At present, in Toronto, Canada, Dr. Norman Anderson is running an evaluation project on the team approach to delivery of dental care. (56) Utilizing one dentist, one therapist (who fills but does not cut cavities), one hygienist and two chairside assistants, this team has been meeting the needs of more than 3000 patients for the last five years. The scheme is based on prevention and is privately funded from patients' payments. It is proving highly successful for both patients and operators.

Professor R. Duckworth is running a similar experimental programme at London University, using teams of differing sizes to evaluate the most effective. (57)

In New Zealand, where therapists have been trained since 1921, there are large numbers of married women, trained to work in the School Dental Service, who can find no employment opportunities. If a scheme existed to utilize therapists in the delivery of dental care to adults, these women would not only have employment available, but the country would be making use of its' trained manpower resources. As Australia is at the start of its' programme to provide a School Dental Service, utilizing therapists, a similar situation to that existing at present in New Zealand, with respect to its' unemployed therapists, will inevitably arise. Valuable, well-trained manpower will be wasted if long range plans to utilize them are not laid down now.

The scheme as outlined in this paper plans to make use of these resources.

Problems of health are now involved in Politics. Health is being accepted as the right of all and not the prividedge of the few.....all of a sudden, millions of people are entitled and request services for which we are not prepared and cannot supply. The immediate Government reaction is expressed in a flurry of emergency legislative measures, entitling some auxiliaries to carry out some of the treatments under some supervision; and the usual solution recommended is an infusion of sufficient money to produce a massive increase in the number of the traditional health professionals, produced by both existing and proposed tertiary institutions, which up until now, has led us nowhere.....

Dental care is expensive, the geographical distribution of dentists is uneven and much less than one half of the population avails itself of their services. The dentist, a highly education and thoroughly skilled expert, spends about two-thirds of his professional life implementing routine procedures that can be carried out competently by skilled auxiliaries. Dental care, as delivered in single practices, is the most inefficient and wasteful use of dental manpower that one could imagine. It may even be called a non-system."(1)

BIBLIOGRAPHY

1. SCIAKY, I: Unpublished speech, 1973.

2. WALSH, J.P., Sir: Personal communication, 1973.

3. HILLENBRAND, H: The Scope and Urgency of the Dental Manpower problem.
J. Amer. Coll. Dent. Vol. 35; 2, 1968, pp. 113-122.

4. NAUGHTON, P.J. and McKEGG, R.N: Unpublished preliminary analysis of answers to questions concerning dental services given by 600 adults 35-44 years. Australia.

5. MARTENS, Leslie V and MESKIN, Laurence H: The current character of practice and the expectations of dental students.
J. Pub. Health Dent., Vol 31:4, Fall '71, pp. 268 et. seq.

6. REEVES, J.F: Vocational Training for the General Dental Practitioner.
Br. Dent. J., Vol. 132; 7, Apr. 4, 1972. pp. 279 et seq.

7. DAVIES, G.N., KRUGER, B.I. and HOMAN, B.T: Dental survey of children in country districts of Queensland.
Br. Dent. J., Vol. 132, No. 4, Feb. 15, 1972.

8. SCIAKY, I: The training of dental auxiliaries.
Int. Dent. J., Vol. 19; 1, 1969, p. 49 et seq.

9. URBAN, F: The use of auxiliary personnel in teaching dentistry.
Int. Dent. J., Vol. 19:3, 1969, pp. 445 et seq.

10. ARNOLD, G.T.E.R: The dental assistant, the clinical chairside assistant, and the dental hygienist as members of the dental team in general practice.
Int. Dent. J., Vol. 19:1, 1969 p. 12 et seq.

11. DONALDSON, K.I: The key man in oral diagnosis.
N.Z. Dent.J., Vol. 69:315, 1973. Pg. 40.

12. HILLENBRAND, H: Charge to the Workshop.
J. Amer. Coll. Dent., Vol. 35:2, 1968, Pg. 112.

13. GULLET, D.W: Charge to the Workshop.
J. Amer. Coll. Dent., Vol. 35:2, 1968, pp. 110

14. BARNARD, P.D: Facts anf Figures, Aust. Dent. Assoc., North Sydney, 1972.

15. Professional and Technical Manpower Study No. 1 - Dentists - Department of Labour and National Service, Melbourne, 1970.

16. Victorian Dental Advisory Committee Report, September, 1969 p. 32.

17. NAUGHTON, P.J: Australian Defense Forces Requirements. Personal communication.

18. BARNARD, P.D: Personal Communication, 1973.

19. BARNARD, P.D: Personal Communication, 1973.

20. YOUNG, W.O. and STRIFFLER, D.F: The Dentist, his practice, and his community: Philadelphia, W.B. Saunders, 2nd Ed., 1969, 346, pg. 196-7.

21. American Dental Association: The 1956 Survey of Dental Practice. IX Summary. J.A.D.A. Vol. 55, Jul. 57, Pg. 126-133.

22. W.H.O. Technical Report Series, 1959, Vol. 163, Pg. 3.

23. LEATHERMAN, G.H: An International Survey of Auxiliary Personnel. Int. Dent. J., Vol. 19:1, Mar. 1969, Pg. 49.

24. TAN, K.N: The School Dental Nurse. D.P.H. Thesis, 1967.

25. LESLIE, G.H: More about Dental Auxiliaries A.D.J., Vol. 16:4, Aug. 71, P. 201.

26. SCARROTT, Diana M: Economic Aspects of Delegation to Ancillaries. Br. Dent. J., Vol. 134, No. 1. Jan. 2, 1973.

27. W.H.O./S.P.C. Report on 3rd Dental Health Seminar, Noumea, Jan.-Feb., 1971.

28. BERMAN, D.S: Utilization of the Dental Auxiliary - School Dental Nurse. Int. Dent. J., Vol. 19:1, Mar. 1969, Pg. 24.

29. FISHER, M: The costs of delivering dental services.
J. Pub. Health Dent., Vol. 30:2, Spring, 1970.

30. HIXON, E.H: A future for New Zealand Dentistry.
N.Z. Dent. J., Vol. 69, 315, 1973.

31. COX, S.L: Expanded duties for dental auxiliaries.
J. Pub. Health Dent., Vol. 30:2, Spring, 1970 Pg. 80.

32. LUDWIG, T.G: Hastings Fluoridation Project.
N.Z. Dent. J., Vol. 67, 309, Jul. '71.

33. DOUGLAS, WALLACE et al: The Impacts of Fluoridation on Patterns of Dental Treatment.
J. Pub. Health Dent., Vol. 31:4, 1971.

34. MULLEN, G: Why the duties of dental auxiliaries should not be expanded.
N.Y. State Dent. J., Vol. 37, 1971, Pg. 218-225.

35. Division of Public Health:Methods - Public Health Service.
Health Statistics from the U.S. National Health Survey: Dental Care - Interval and Frequency of visits - U.S. July 1957 - June 1959 - Washington Government Printing Office, 1960, Pg. 1-8.

36. SULLENS, R.H: Why the duties of dental auxiliaries should be expanded.
N.Y. State Dent. J., Vol. 37:4, 1971. Pg. 210-217.

37. KOERNER, K.R: Dynamic Transition in Dentistry; Expanded Functions of Auxiliaries.
J. Pub. Health Dent., Vol. 31:2, 1971, Pg. 123.

38. FISHER, M.A: New Directions for Dentistry.
Amer. J. Pub. Health, Vol. 60:1, 1970, Pg. 855.

39. CONS, N: Dental Manpower Needs Present and Future.
N.Y. State Dent. J., Vol. 37:9, 1971, Pg. 535.

40. CHARLES, J., Sir: Medicine, Health, and Government: The Future Outlook.
Jaques Parisot Foundation Lecture. W.H.O. Chronicle, Vol. 24; 9, September 1970, Pg. 385-394.

41. WOODS, R: A Dental Caries Susceptability Test Based on the Occurrence of Streptococcus Mutans in Plaque Material. A.D.J., Vol. 16, Pp. 116-121.

42. BARNARD, P.D: Personal Communication, 1973.

43. BRANDHORST, W.S: Dental Economics J. Amer. Coll. Dent., Vol. 37:2, April 1970.

44. DAVIES,G.N., KRUGER, B.J. and HOMAN, B.T: Dental Survey of Children in country districts of Queensland. A.D.J., Vol. 14:3, Jun. 1969, Pg. 158.

45. McKEGG, R.N. and NAUGHTON, P.J: Practice Access Study. (Unpublished data.)

46. KRIESBERG, L. and TRIEMAN, Beatrice: Socio-economic status and the utilization of dentist's services. J. Amer. Coll. Dent., Vol. 27, 3, Sept. '60, P. 147-165.

47. VIDNER, G.C: The Dental Service Corporation: It's Role in the Delivery of Oral Health Services. J. Pub. Health Dent., Vol. 30:1, 1970, Pg. 28-29.

48. BECK, D.J: Dental Health Status of the New Zealand Population in Late Adolescence and Young Adulthood. Department of Health Special Report No. 29, Government Printer, Wellington (N.Z.) 1968.

49. HALIKOS, S.E: A Study of Dental Caries in a Group of West Australian Children. Part I. The Incidence of Dental Caries in Permanent Teeth. A.D.J., Vol. 7, No. 6, December 1962. Pg. 465-470.

50. WALSH, J.P., Sir: The Changing Face of Dentistry. N.Z. Dent. J., Vol. 66:305, Jul. 1970, Pg. 214.

51. GREEN, E.J: Dental Auxiliaries. J. Amer. Coll. Dent., Vol. 37:2, Apr. 1970, Pp. 110-118.

52. BYRT, W.J: People and Organizations. McGraw-Hill, Sydney, 1971. Pg. 73.

53. YOUNG, W.O. and STRIFFLER, D.F: The Dentist, His Practice, and His Community. Phil. W.B. Saunders, 2nd Ed. 1969, 346, Pg. 273-274.

54. CRAIG, G: Department of Preventive Dentistry, University of Sydney. Personal Communication, 1973.

55. Council on Dental Education of the American Dental Association and the American Association of Dental Schools - Conference on Utilization and Training of Dental Assistants, September, 13th-15th, 1960.

56. ANDERSON, N: Canadian Board of Registration. Personal Communication, 1973.

57. DUCKWORTH, R: Personal Communication, 1973.

58. WHO/USPHS International Collaborative Study of Dental Systems. Analysis of Australian Data 35-44 year olds - P.D. Barnard.

59. BARNARD, P.D., GILLINGS, B.R.D. and GILLINGS, K.J: Assessment of a Preventive Dentistry Programme in Private Practice. - to be published.

APPENDIX A

DIRECTOR

To manage and review all activities, and plan, establish and review new services. To co-ordinate the activities of all personnel responsible to him.

DEPUTY DIRECTOR (STAFF)

a. To ensure adequate staffing of facilities.

b. To plan for efficiency of operation and evaluate service effectiveness

c. To review staff conditions and career services.

d. To assist the Director where necessary

e. To assist in planning.

RESEARCH DIRECTOR

a. To plan, implement and co-ordinate research into all aspects of the community and hospital dental health service.

b. To assist in planning operations.

THERAPIST MANAGEMENT SUPERVISOR

a. To implement and conduct all retraining of therapists in two areas: 1. To train them for the adult service,

2. To provide periodic in-service training.

b. To maintain standards of operative efficiency amongst therapists, and working with the Registrar, to evaluate and encourage therapist operations.

HOSPITAL DENTAL REGISTRAR

a. To maintain day to day control of Community Dental Health Centre.

b. To provide special services within the Adult Dental Service at the Hospital.

c. To assist in planning, evaluation and research.

DEPUTY DIRECTOR (PURCHASING AND COST CONTROL)

a. To ensure adequate logistical support to the Adult Dental Service.

b. To maintain evaluation of cost effectiveness in the Adult Dental Service.

c. To assist in planning and research.

THERAPIST INSPECTOR

a. To maintain close liaison with therapists.

b. To ensure therapist standards.

c. To report to the Registrar.

d. To assist in research.

DENTAL OFFICERS

a. To manage the operations of the Community Health Centre.

b. To diagnose, treat and/or refer patients.

OFFICE MANAGERS

a. To maintain records.

b. To ensure logistical support and maintenance.

c. To handle wages and payment

d. To deal directly with patients as required.

CLERK

a. To deal with patients.

b. To help maintain records and filing systems

c. To do any typing necessary.

d. To assist the office manager where required.

SENIOR THERAPIST

a. To work under the direction of the dental officer, to perform tasks as required.

b. To ensure high personal standards of dress, hygiene and record keeping of all staff therapists and chairside assistants.

c. To act as spokesman for all staff therapists and chairside assistants.

THERAPISTS

a. To work under the direction of the dental officer, to perform tasks as required.

b. To maintain a high personal standard of dress and hygiene and record keeping.

CHAIRSIDE ASSISTANTS

a. To assist at the chairside as required.

b. To maintain surgery stocks.

c. To assist patients.

d. To work as directed by the dental officer and the senior therapist.

e. To maintain surgery equipment in a clean, functional condition.

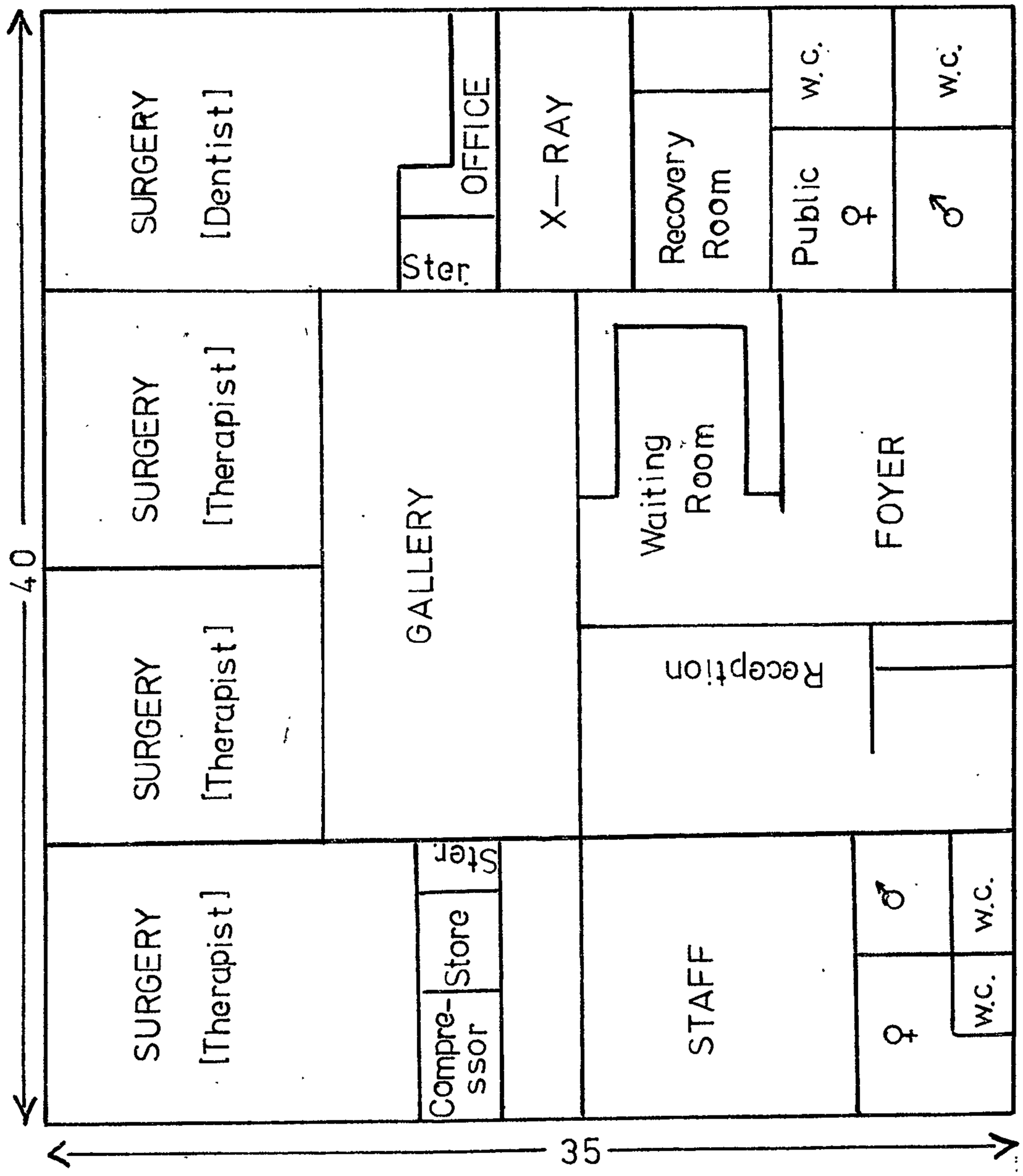
APPENDIX B

TIMES ALLOTTED FOR OPERATIONS

1.	Topical Application of SnF_2		25 minutes
2.	Initial diagnosis		10 minutes
3.	Completion of restorations		15 - 20 minutes
a.	One therapist	(1) 1600 hours	
		(2) 3 patients/hour	
		(3) 2 treatments/year/patient	2,400 patients
b.	Two therapists	As above	4,800 patients
c.	One dentist to diagnose 4,800 patients		800 hours
d.	Surplus hours available in Unit for other operative procedures	i. Dentist	800 hours
		ii. Third therapist	1600 hours

APPENDIX C.

PLAN — COMMUNITY DENTAL HEALTH CENTRE



APPENDIX C

Specification List for Therapists' Surgery

1. 1 x stainless steel shelf trolley, approximately 36" x 20", with rails around three sides of upper and lower shelves.
2. 1 x control box from mini cart containing controls for airotor, air motor (or electro-torque) and 1 x 3-way syringe. This is to be bolted to the right side of the top shelf on the trolley.
3. 1 airotor handpiece.
4. 1 air motor handpiece (or electro-torque).
5. 1 pump action 'flow line' chair.
6. 1 operator stool.
7. 1 assistant stool.
8. 1 aspirator (virillium type)
9. 1 operating light.
10. (a) Gallery wall to have 18" wide shelf running from door to opposite wall.

    (b) "Assistant" wall to have sink unit with foot taps and three shelves, one 18" wide as a working bench, the other two 10" wide above it for storage. These shelves to run the length of the wall from the sink unit.
11. 1 stool.
12. 1 fluorescent ceiling light.
13. Hand instruments as specified.

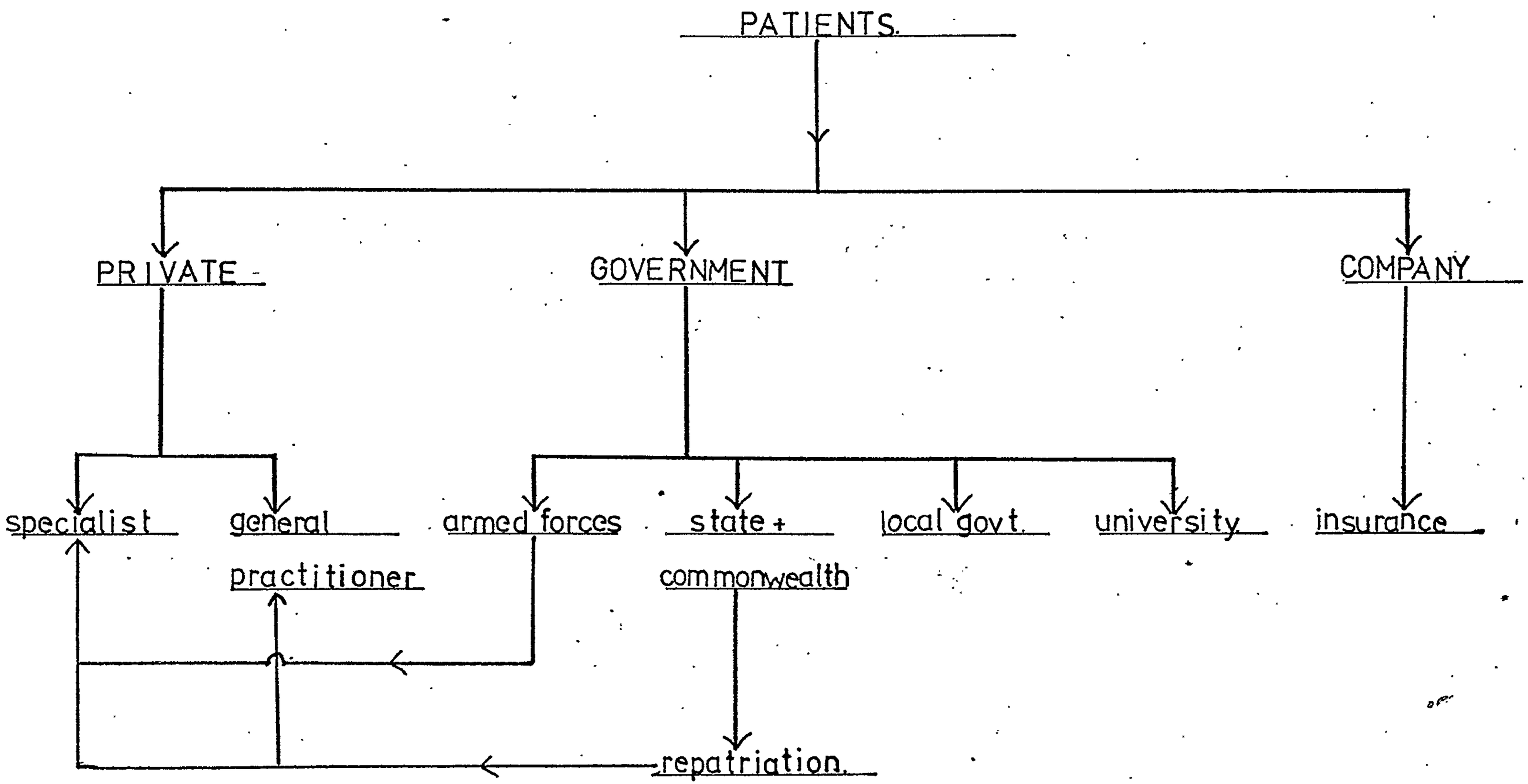
For dental officers' surgery, the following should be added:

1. Built in desk and chair.
2. Oral surgery instruments as specified by the Director.
3. Crown and Bridge instruments as specified by the Director.
4. Prosthetic instruments as specified by the Director.

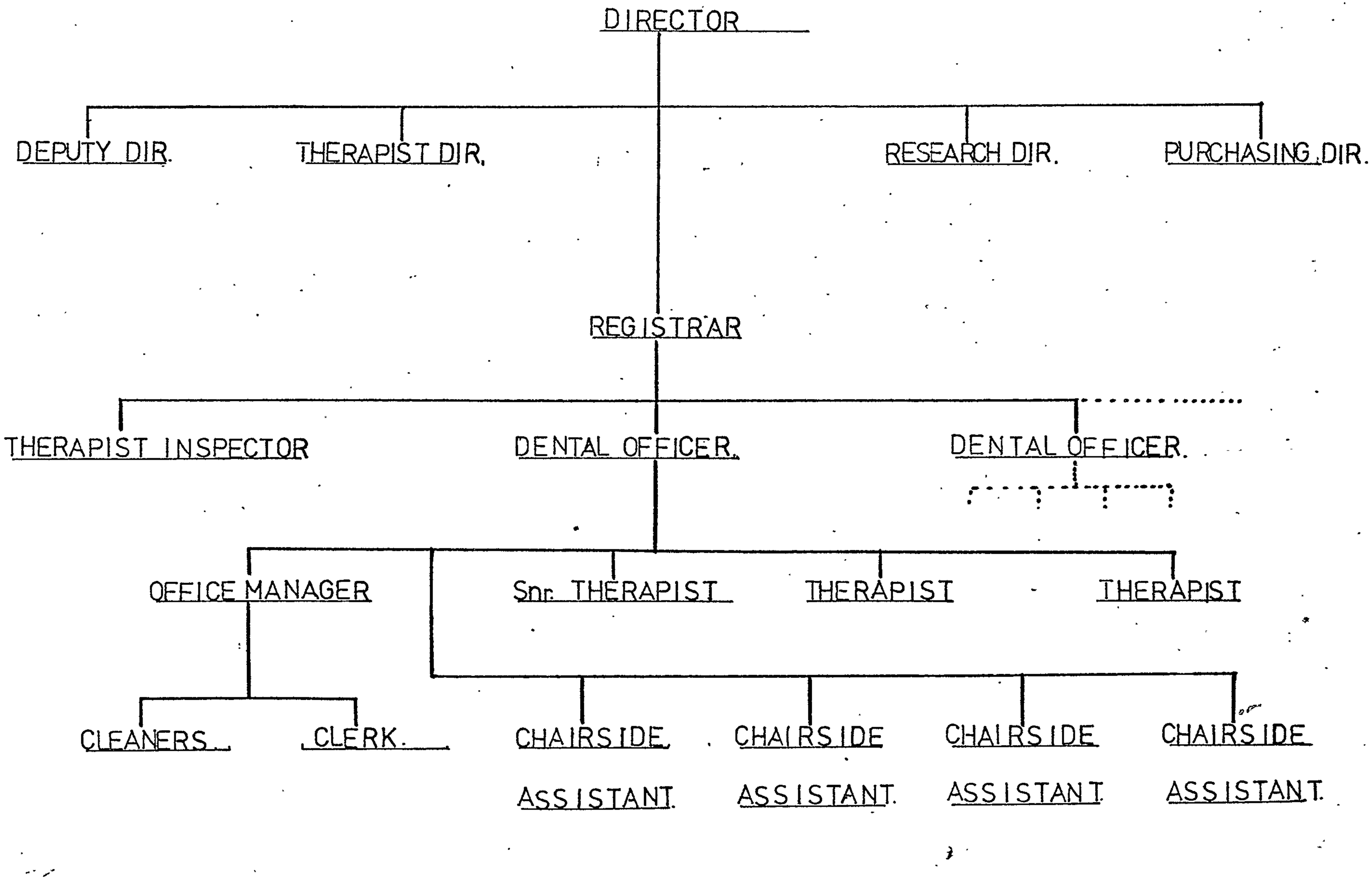
COST ESTIMATES (July 1973, Sydney)

1 pump chair with 'flow line top'	$550.00
Control box and three-way syringe	500.00
2 handpieces	400.00
1 trolley	60.00
Stools	100.00
Aspirator	360.00
Light (overhead and operating)	544.00
Instruments	550.00
Fittings (shelves, sink)	150.00
½ sterilizer	150.00
TOTAL:	$3,364.00

TREATMENT AVENUES 1973. FIG 1.



LINE FUNCTION. FIG 2.



MATRIX ORGANISATION
COMMUNITY DENTAL
HEALTH CENTRE

DENTAL REGISTRAR
(Hospital)

	DENTAL OFFICER (Community)	THERAPIST INSPECTOR (Hospital)	SENIOR THERAPIST (Community)	OFFICE MANAGER (Community)
THERAPISTS				
CHAIRSIDE ASSISTANTS				
CLERK/S				
PATIENTS				

FIG. 3

FEEDBACK. FIG 4.

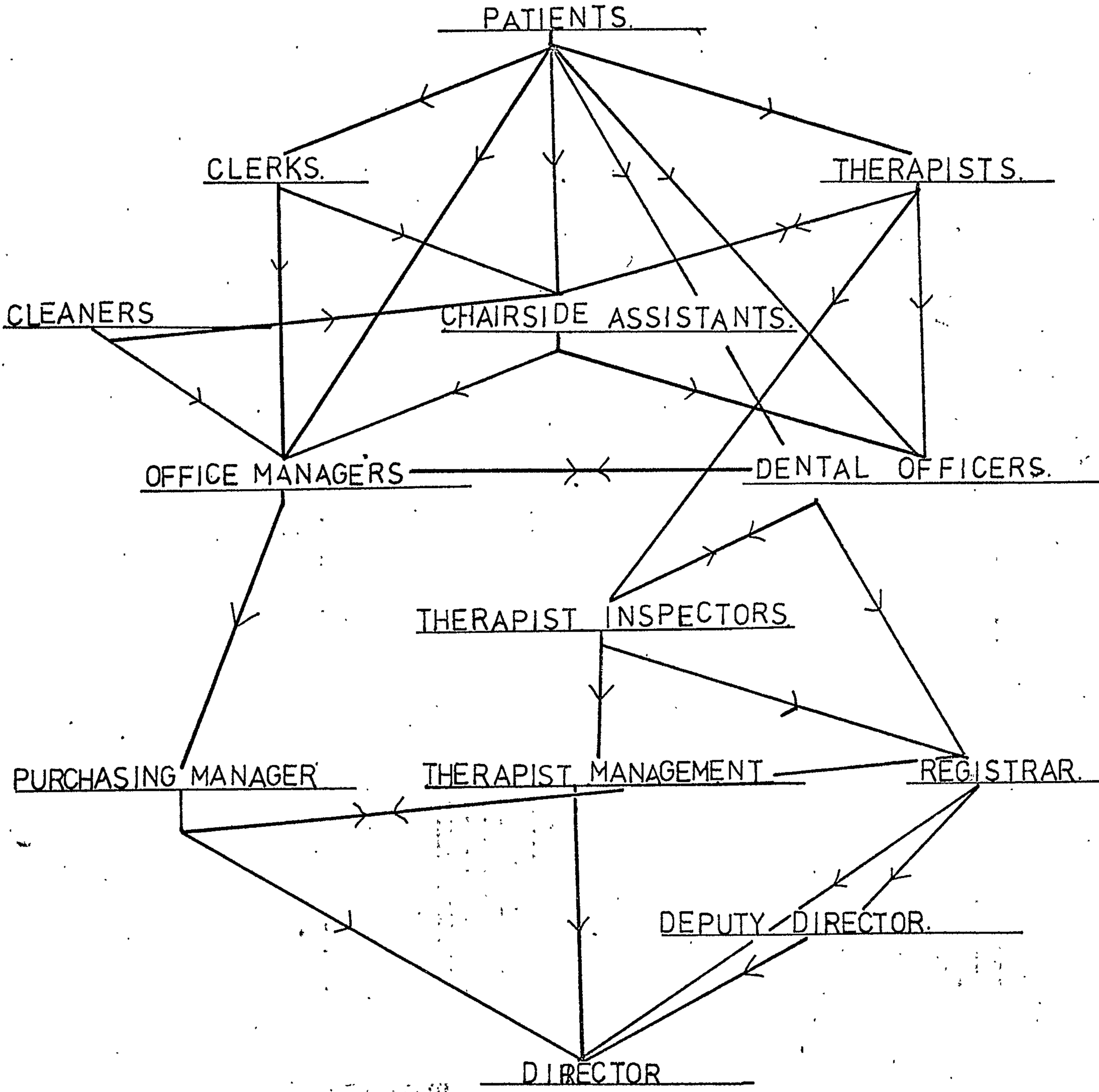


FIG 5

EFFECT OF CHAIRSIDE ASSISTANT ON DENTISTS WORKLOAD