Use of Auxiliary Personnel in Dental Care Programs*

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AT the annual meeting of the Committee on Administrative Practice of the American Public Health Association, held October 9, 1943, the Subcommittee on Medical Care was directed to draft a set of principles expressing the desirable content of a comprehensive program of medical care, the methods of its administration, and the part which public health agencies should take in its operation. The report eventually, by action of the Association on October 4, 1944, became an official statement of the A.P.H.A.[1]

The study was considered but one sector of a comprehensive national health program, namely, medical care. The report states, under recommendation VI "Training and Distribution of Service, Personnel," b, that "The plan should provide for the study of more effective use of auxiliary personnel (such as dental hygienists, nursing aides, and technicians) and should furnish assistance for their training and utilization."

The study of the more effective use of auxiliary personnel for the dental profession was assigned to Nathan Sinai, Edwin F. Daily, and R. M. Walls. This study has not been completed and is not ready to be presented to the committee, hence the material offered here represents the views of the author alone.

According to O'Rourke[2] there are five or six trained auxiliary workers for each physician and approximately two-thirds of such aid for each dentist. At first there was much opposition to the formal training and the registration of nurses. But while there was one nurse to each physician in 1920, in 1940 there were two to each physician. This is but one example of the evolution of auxiliary groups in the medical field. The physician has been wise in delegating so many services to ancillary aides —from the construction and fitting of artificial eyes and limbs to the multitude of laboratory technics.

The dental profession has been very reluctant and slow to accept the services of auxiliary personnel. The "chair assistant" has assisted the dentist for a century and, according to Klein, those who avail themselves of such well trained aides increase their service to the community 25 to 50 per cent, yet today less than one-half of the profession have such assistants. Dentists have been required to spend most of their time meeting the demands for fillings and restorative appliances for adults. Some items have been delegated to specialists, but, as compared with a solution of the whole problem, this delegation has not been significant.

Many dentists or groups of dentists avail themselves of the services of prosthetic laboratory technicians, either working under close supervision or off the premises under no direct professional supervision. This type of auxiliary worker undoubtedly saves the dentist many hours in actual labor, but little

* Presented before a Joint Session of the Dental Health and Medical Care Sections of the American Public Health Association at the Seventy-sixth Annual Meeting in Boston, Mass., November 11, 1948.

of this time helps to produce more chair hours because it is rare that a dentist who can otherwise fill his chair-time hours will spend such time in his prosthetic laboratory, and so such work is done during the evening. It can truthfully be said that the use of the laboratory technician as an auxiliary worker does not make more chair-time available so that more patients may be served by the dentists.

The only auxiliary operator in the dental field that has legal status is the hygienist, and the tumult that raged within the profession at the time of the conception of this new idea may still be heard each time that a state attempts to amend its laws to permit the licensing of hygienists. In the first decade of the 20th century, Dr. D. D. Smith of Philadelphia, propounded and demonstrated some of the potentialities of dentistry as a health service. Dr. Alfred C. Fones, of Bridgeport, Conn., was so impressed with the work of Dr. Smith that he conceived the idea that the subject of oral health was of sufficient importance to warrant the training of individuals who would devote their chief energies to dental prophylaxis and dissemination of information to the public, through the schools, in regard to the value of a clean and properly functioning oral cavity to personal health. As a result of Dr. Fones's indefatigable efforts, a school for dental hygienists, with a faculty which has probably not been equalled since, was established in Bridgeport in 1913. Since that time the dental hygienist has been licensed by 38 states, and almost without exception has become recognized as an important ancillary to modern dental health service, yet they are found in only 4 per cent of dental offices. This auxiliary operator, without proving a threat to the established form of dental practice, has so conclusively demonstrated her worth to both institutional service and private practice that she has become as essential to modern dentistry as the registered nurse is to modern medicine. In private practice the great majority of her patients are adults; it would be of great significance if the time that is saved by her employer were spent in rendering service to children.

How do our educational facilities measure up to the problem of supplying sufficient graduates in dental surgery to meet the present-day need?

It is interesting to note that in 1900 there were 57 dental schools, in 1921 45 dental schools, and in 1933 but 39. At the present time there are 41 schools, only two of which offer dental training on a large scale to the Negro. Horner [3] states that many factors enter into the fixing of the numbers of students in dental schools and the number that are graduated, such as wars, depressions, and changing entrance requirements. The highest enrollment since 1925 was 9,014 in 1943, and the highest number of graduates since 1928, 2,470 in 1944. This increase was due to the accelerated plan of instruction operating during the war. The lowest enrollment since 1925 was 7,160 in 1933, the result of the depression in 1929. The lowest number of graduates since 1930 was 1,568 in 1941. This decrease was in part due to the effects of the depression, and in part to the increased requirements that went into effect in 1937.

If we accept Horner's figures, the number of dentists in this country in 1941 was 75,685 or 1 to 1,740 of population; in 1945—77,188, or 1 to 1,801 of population; and he estimates for 1950—76,632 or, 1 to 1,933 of population.

These data of Horner's [3] show an estimated loss of dentists, steadily, after the year 1947. Even with the creation of three new dental schools, which should provide the graduation of 2,500 dentists per year, and if from 1950 to 1960 we should have the expected increase in population of 6 per cent, we would have 82,500 dentists in 1960 and a popula-

tion per dentist of over 2,000. Thus it would appear that our population per dentist for the 3 decades from 1930 to 1960 will show a progressive increase and that the provision for dental care will be less in 1960 than it was in 1930.

If the many programs of health education in the past 3 decades have had the desired effect, there will be greater demands for dental services in general. Improved methods of transportation are making dentistry available to many in the rural areas. Organized groups are including dental services in their health programs. The new Army program will further disjoin the dentist: population ratio.

Says Morrey,[4]

> Since the number of graduates from dental schools is influenced by many things which upset the increase in the number that should be expected to take care of normal growth of the population and since it requires so many years to reëstablish this normal output, all plans for the expansion of dental service to the population are put in jeopardy, it would seem to me that some other plan for increasing the man-power is in order.
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> There is no disputing the fact that, during the past fifteen years, the supply of dentists has not kept abreast of the public appreciation and demand for service; and that as a result, in the United States, dentistry is seriously undermanned. Any dental program, whether inaugurated on a national, state, or local level, must take that fact into serious consideration. Judging from existing figures and by the upward trend in public appreciation of dental service, it seems safe to predict that the dental profession will be barely able to meet current dental demands and that, under present methods of practice, the profession will be exceedingly over-taxed to supply anticipated future demands.

Again quoting from Morrey[5]:

> Until that day dawns when therapeutic measures can be employed to prevent dental caries, the dental profession should bend its every effort and the efforts of its auxiliary forces toward controlling caries by the most practical method known at the present time, namely, dental operative procedures for children. This is not a new formula, on the contrary, it is one that has been advocated for many years. Unfortunately, it has never been wholeheartedly accepted by the public, and it has been accepted only in principle, but not in fact, by many members of the dental profession.

Klein[6] has made a rather exhaustive study of the needs of the population and has estimated the number of chair-hours that would be required to take care of the accumulated needs and the yearly incidence of decay. Time will permit but one quotation: "The yearly crop of dental need in the whole American population requires for its service probably at least double the present volume of dentists, that is, instead of 65,000 dentists, at least 130,000 are required, just for yearly maintenance." It is interesting to note that in the 107 years since the first dental graduates were sent forth there have been but 126,500 following in their footsteps.

Unfortunately the child suffers most from the lack of man power, pointed out so convincingly by Klein. There are but two or three hundred dentists in this country who devote their entire time to dentistry for children, while the general practioner seems largely indifferent to the needs of the child. Children are apt to be difficult patients, making it hard to render good service and, in the hands of most operators, limiting the types of materials that may be used for fillings. Rarely are inlays indicated or possible; rarely are crowns and bridges inserted. Dentistry for children is not made available in many offices because it brings comparatively small financial returns. Yet children should receive more dental service, beginning at a very early age and on a constantly continuing basis.

Consider just one of the ills that beset the child who does not receive dental care: the early loss of deciduous teeth and of the six year molar—resulting in the drifting of teeth—is one of the greatest causes of malocclusion of the jaws. It has been estimated that 60 per cent of children today have malocclusions that should be treated by the orthodon-

tist. The services of the orthodontists are necessarily costly, and there are far too few to serve the need. Such services are but rarely available to those in the low income group; very few clinics offer such services to the indigent.

Bauer[7] states that the fact that the child receives secondary consideration was impressed forcibly upon the laity and the profession in the reports of Selective Service. He feels that the lack of financial returns, poor patient management, the lack of preparation provided by many schools, and the subordinate place of pediodontics in state board examinations are responsible for this lack of service.

Salzmann[8] observes that it requires a general depression such as was experienced in the early and middle 30's to make the profession turn toward meeting the needs of children, and that during the war and since then, pediodontics has reached a very low ebb. The American Dental Association and various state and local dental societies, recognizing this trend, made appeals on professional as well as patriotic grounds that children be given priority appointments, but in spite of a high per cent of pledges by the profession, in actual practice it was found that children were not being favored. Salzmann goes on to state "that between the unwillingness of the private dentist to meet his responsibility to children and the growing demand upon the part of interested lay groups, it may well be that the provision of dental care for the children will be taken out of the hands of the profession altogether. Already there is talk of developing auxiliary workers to care for the children."[9, 10]

Jeserich[11] states it this way:

> The present regime of practice demands a heavy concentration of effort and thinking on technical procedures, based vaguely on a rather confused background of biologic principles with a gradually fading consciousness of their significance and as a result a waning effort to correlate them with clinical practice. More hands especially trained for technical procedures under the direction and supervision of the licensed dentist . . . with a practice regime permitting the use of this concept to guide his and the hands of others, would seem to be desirable from the points of view of both quantitative and qualitative service considerations. Part of medicine's greater appeal when compared with dentistry is due to the fact that it affords an opportunity to use the mind without so much emphasis on technics. Dentistry's thinking is too fettered to technics by the nature of its present system of practice. In medicine, nurses, technicians, interns, and other aides make it possible for one mind to direct and guide several hands and minds trained to be auxiliary aides.
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> The dental profession seems to fear that something will be taken away from it whenever the creation of any group of auxiliary aides is discussed. As long as these aides are under the immediate supervision of properly trained ethical practitioners, and have had adequate training for their limited function, such fears do not seem logical and would appear unwarranted. It would be more logical to presume that something was being given to the profession rather than taken away, both from the objective of quality and quantity of service and from the point of view of economic considerations favorable to the profession as well as to the people served. The violations of auxiliary aides would be dependent entirely upon the ethics of the licensed practitioner, and in the last analysis the profession of dentistry. There would have to be a deliberate breach of ethics or law by the profession to have violations. Are we afraid of ourselves or the auxiliary aides?

I would like to quote Elam[12]:

> It is my considered opinion that the time has come when the dental profession must broaden its auxiliary services if it expects to meet the increasing demands upon it. At the same time it must protect its present standards of dental education and exert firm control over all phases of dental service. . . . The fact is, as I see it, the dentist without help cannot possibly supply the demands for all dental services. The demands are increasing daily and unless the demands are met by the profession, other agencies will seek to supply them. This can be done in many ways as has been attempted in other countries. The only solution for the profession, to meet its obligation to the public, is to accept, train, and control all the help that it needs.

Since the number of new graduates entering practice each year is not to any

great extent exceeding the number of practitioners who retire or die annually, it is obvious that making dental service more readily available to the public cannot be brought about for many years by merely adding to the total of practitioners in the usual way. The previously mentioned committee of the A.P.H.A. is well aware of this fact, and after reviewing the present use of auxiliary personnel by the dental profession—the hygienist, the chair assistant, the laboratory technician, as well as the use of multiple operating units—finds that these present practices fall far short of producing the man power hours required to meet the present demands for dental service and that the development of a new type of auxiliary worker should be considered, if more extensive public health programs in the dental field are to be made possible.

A study of the system in use in New Zealand has been made and brings to light the following: The government in 1919, reviewing the health of its armed forces during World War I, determined to do something about the dental health of its children, and instituted the New Zealand School Dental Service. In 1920 Col. T. A. Hunter, C.B.E., Director of the Army Dental Service during the war, was appointed Chief Dental Officer of this post-war service.

Colonel Hunter's proposals were considered revolutionary but eventually the New Zealand Dental Association gave its formal approval of his proposals and the first draft of young women to undergo training as dental nurses was appointed in 1921.

This service, created by the government, organized and controlled by the Director of the Dental Division of the Department of Health, was organized in six units, each of which is controlled by a senior dental officer who is directly responsible to the director. These officers are the Principal of the Dominion Training School for Dental Nurses, and the Senior Dental Officers in charge of the five dental districts into which the Dominion is organized.

Graduate school dental nurses are officers of the Department of Health, but they are "attached for special duty" to the staff of the school at which their clinic is situated. While they come under the general jurisdiction of the Headmaster, their actual controlling officer is the Senior Dental Officer who is assisted by a staff of inspectors and assistants.

The school dental nurse receives her training in a special school at Wellington. The applicant must be a young woman with high physical fitness, good personality, between the ages of 17 and 25 years. She must have passed, as a minimum requirement, the university entrance examination or school certificate examination. She must agree to serve for not less than five years, including the two years training period. The cost of the training is borne by the government.

The curriculum is well planned to provide the student with the ability, among other things, to fill and extract deciduous and permanent teeth. The senior Dental Officer or his aides are consulted in regard to any patients who present conditions which appear to require special treatment. Health education is stressed, so that the patients may be instructed in the principles of oral hygiene and the preservation of the teeth.

There is no means test. All children are eligible, irrespective of the social or financial position of their parents. Attending school is a prerequisite to obtaining dental treatment, except in the case of preschool children and adolescents. It is necessary to enroll while in the primer classes, that is, not later than the second year of attending school but enrollment during preschool age is preferred and encouraged. It is interesting to note that eligibility for the ex-

tended service that embraces the adolescent group is contingent upon a person having undergone regular treatment up to within three months of the time of application, either at a school dental clinic or at the hands of a private dental practioner.

Every patient is required to undertake: (a) to attend for treatment or examination at such times as may be required; (b) to apply for treatment as soon as he becomes aware that treatment is needed; (c) to apply for examination at an interval of six months from his completion (the responsibility for this is placed on the system, but the patient should draw attention to any omission to call him up); (d) faithfully to carry out such instructions as are given in regard to oral hygiene and dental health.

If a patient should fail to report within twelve months of his previous completion, his name may be removed from the roll. He may be reënrolled if he has his dental condition restored to a satisfactory standard at his own expense.

The school dental nurse supplies the service for the child until he reaches the age of 13. Not more than 500 children may be assigned to one nurse. The adolescent group, recently included in the program, is served by dentists.

The annual report for 1946–1947 shows that for the year ending March 31, 1947, there have been established 456 treatment centers; the staff numbered 679 including 206 student dental nurses. There were 423 school dental nurses in the field. There were 226,798 children under treatment; 2,313 schools were embraced in the treatment areas. From the report I note a ratio of 6.3 extractions to every 100 fillings, which is quite a contrast to 114.5 extractions per 100 fillings in the first year of the program. The cost of the service per child was approximately £1 per annum. The costs include salaries, maintenance of hostels for housing the student nurses, and buildings. The school dental clinics in the field are built by the Educational Department and are not included in the cost figures. The cost of training a dental nurse in the last yearly report was given as £600 for the two years. Against this figure is assessed the value of the clinical services which are rendered during the second year, of £200, making the net cost of educating the dental nurse £400. I have long been of the opinion that this program which has been in operation in New Zealand for 27 years, if introduced into this country would in time solve the problems that have been stated by Morrey, Salzmann, Elam, Klein, Jeserich, Millberry, Clawson, McCall, and others.

I have discussed with the deans of several dental schools the possibility of producing a course comparable to the one given in New Zealand at the training center for school dental nurses in Wellington. Without exception these men stated that it would be possible to provide a similar or better course of instruction at their institutions.

Clawson[13] said recently that he and his colleagues at Meharry have given considerable thought to a plan which is based on their willingness and ability to offer a curriculum from which all subjects not essential for dentistry for children would be eliminated and only those subjects absolutely essential to good children's dentistry would be retained, in a two years course. I must refer you for further consideration of the rather elaborate plan to Clawson's complete statement, but let me quote briefly: "We would give it a trial tomorrow if I could find one state board that would give a licensing examination to the product of the course."

I have presented the picture of the present lack of dental personnel and the rather dubious outlook for the reduction in the future of the dentist; population ratio. I have not included

in this presentation an estimate of what proportional changes may result as the "draft" program gets underway, because at this time the picture is not clear.

I have very briefly outlined the need; it is so very well known to all of us. I have quoted various men, prominent in the dental health and educational field, who believe that an extension of the type and use of auxiliary personnel by the dental profession is indicated. I have given a concise statement of the system that has been in vogue in New Zealand for 27 years. I have quoted a plan that has been projected by a well known dental educator, who has had vast experience in dental education at home and abroad.

I am not unmindful of the strides that have been and are being made by scientists in their determination to discover the cause of dental decay and to apply their knowledge. The men who are outstanding in this field do not anticipate more than a 40 per cent decrease in the dental caries rate. Presupposing that, as a result of a general application of new knowledges, the adolescent enters adulthood with better teeth and more of them, and the life expectancy continues to be pressed upward, then there will be more of the diseases of the oral tissues that come with age to be treated. Naturally the field of the dentist would be extended with this new demand and the children who would require service would still not find it available.

There is considerable difference between the need for services and the demand by the population. But I cannot agree with a statement made recently that the demand rather than the need for dental services should be the guiding principles in increasing the number of dentists and auxiliary personnel.[14] I believe that dental services for children should be made readily available to every child.

I have long been of the opinion that a healthy mouth should be a prerequisite for enrollment in school and a requisite for the continuance in school. All existing obstacles that deprive children in the low income families or children on farms or in other sparcely settled areas, or Negro children, of dental services, would be removed if the state departments of health would make this new type of periodontist available to the schools. Hand in hand with education should go a healthy mouth.

In the opinion of the writer, which is shared by many others, a research project should be undertaken on this continent, in the United States preferably, so that the utilization of specially trained auxiliary personnel may be observed and evaluated by the profession. The personnel could receive a carefully worked out course of instruction, over a period of two years, at a recognized institution. Authorities in the field of pediodontics, dental education, and public health would advise and assist in the planning of the research project and the evaluation of results. It is to be hoped that some state will show a willingness to suspend its licensing law and be willing to sponsor the study. I believe funds could be made available.

Millberry, in October, 1938, at a joint session of the Child Hygiene and Public Health Education Sections of this Association presented a paper entitled "Possibilities and Means of Improving Dental Conditions in the United States." He said, among other things, "Does it not seem possible to you that we should be able to train persons to do these simple operations for children in two years time?"

When Dean Millberry's paper was published in the *Journal*,[15] the following was a part of the editorial that appeared in the same issue:

> There can be no doubt that the cost of dental treatment is high and that the funds for providing it on a community basis are all too small. Any relief, such as offered by Millberry, will seem welcome to public health

administrators, most of whom have little knowledge of the technical problems involved. Over against this group will be the mass of dentists who will probably prejudge this proposal on its departure from the *status quo* without inquiry into its possibilities. Without taking a stand for or against the Millberry plan, it at least seems proper to suggest its consideration by a group of dentists thoroughly familiar with the problems involved in giving dental care to American children. A critical evaluation of the New Zealand method seems desirable also, particularly with regard to its applicability to North America.

I am glad to report that now, after the passing of a decade since the appearance of the editorial quoted above, a committee of this association is actively engaged in studying this whole problem of securing more dental service for children and is planning steps to secure an experimental study of the use of the auxiliary operator with a two year course of education. These plans will require the support of all who are interested in medical care programs and particularly of those who wish to find a practical solution to the problem of providing adequate dental services for children.

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