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SPEECH HABILITATION IN THE SCHOOLS FOR THE CLEFT PALATE CHILD, THE NEW YORK STATE EDUCATION DEPARTMENT PROCEEDINGS (MARCH 17-20, 1965).

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DESIGNED TO STRENGTHEN THE SKILLS, COMPETENCIES, AND KNOWLEDGE OF SPEECH CORRECTION TEACHERS, THIS SUMMARY OF A SPECIAL STUDY INSTITUTE CONTAINS A SERIES OF PRESENTATIONS. SPEAKERS DISCUSS ASPECTS OF CLEFT PALATE INCLUDING SPEECH, SPEECH ANATOMY, SURGICAL AND DENTAL MANAGEMENT, DIAGNOSIS, AND SPEECH THERAPY. SPEAKERS REPRESENT MEDICAL AND THERAPEUTIC DISCIPLINES. (CG)

THE NEW YORK STATE EDUCATION DEPARTMENT
PRESENTS PROCEEDINGS ON

SPEECH HABILITATION
in the schools for the
CLEFT PALATE CHILD

MARCH 17-20, 1965

THE UNIVERSITY OF THE STATE OF NEW YORK / THE STATE EDUCATION DEPARTMENT
BUREAU FOR PHYSICALLY HANDICAPPED CHILDREN

COOPERATING AGENCIES: STATE UNIVERSITY COLLEGE AT BUFFALO / ERIE COUNTY HEALTH DEPARTMENT

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FOREWORD

The information contained in this document represents a summary of the proceedings of a Special Study Institute sponsored by the New York State Education Department which concerned itself with programs and services that are necessary in a total program effort in meeting the needs of children with speech problems associated with cleft palate. The reports concern themselves with all aspects of the habilitation problem.

Particular acknowledgement for the development of the Special Study Institute which was initiated through the leadership of the Education Department's Bureau for Physically Handicapped Children and financed from Federal funds under Section 301 of Public Law 88-164 should be given participants of the Workshop Planning Committee. It is hoped the material on the following pages will provide information that will be of value to those who are concerned with enhancing and strengthening existing programs and services available to the cleft palate child as well as to encourage services in those areas where services are lacking.

Rolland J. Van Hattum,
Editor

Workshop Planning Committee

Dr. Anthony J. Pelone, Director, Division for Handicapped Children, State Education Department, ex-officio

Raphael F. Simches, Chief, Bureau for Physically Handicapped Children, State Education Department, Chairman

Dr. Horace Mann, Director, Exceptional Children Education Division, State University College at Buffalo

Dr. William Mosher, Commissioner of Health, Erie County Health Department

Dr. G. Donald Bissell, Dental Director, Erie County Health Department

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Joseph Page, Assistant Professor, Speech Pathology and Audiology, State University College at Buffalo, recorded the proceedings for publication in this booklet.

A Special Study Institute

under Section 301 of Public Law 88-164

INTRODUCTION

The material that has been incorporated in this document represents the joint planning of agencies that are vitally concerned with the care and remediation of disabilities characteristic of cleft palate children. I particularly would like to express my appreciation to Dr. William Mosher who through his persistent probing and questioning of what was happening to cleft palate children in schools served as an impetus for the proposal which the New York State Education Department submitted to and received approval from the U.S. Office of Education. As Dr. Mosher indicated in his greetings, "The cleft palate deformity is one of the most common of the serious deformities we have today. The cleft palate child, not only has a surgical defect, but he is also apt to have dental problems...as well as hearing problems, pediatric problems and psychological problems." We owe a vote of thanks also to Dr. Paul Bulger who made available the personnel and resources of the State University College at Buffalo.

I would also like to once again express appreciation to Dr. Rolland Van Hattum, the Project Director, and the members of his Planning Committee for effecting a very exciting and stimulating program.

Children with speech problems constitute one of the largest groups of handicapped school age children. The importance of language development is being increasingly recognized as part of the overall program of speech correction services, and this has resulted in the significant growth of speech correction programs throughout the State. It is now estimated that over 700 teachers of speech and hearing handicapped children are employed in our public schools, providing services to an estimated 70,000 pupils. Despite the significant growth of speech correction programs, there are children whose complex speech needs are such that speech correction teachers approach the problem perhaps with anxiety and misgivings concerning their ability to provide adequate and effective programs of speech correction. The treatment of a child with a cleft palate condition begins at birth and involves co-operation, coordination, and communication among the various disciplines necessary to effect a remediation of the child's disability with all of its ramifications.

Dr. John H. Fischer, President of Teachers College, has often indicated it is the schools' obligation to see for every pupil three main goals. It must help him to make the most of his capacities; it must enable him to acquire the intellectual skills necessary for a life of continuous learning; and it must prepare him to find for himself a productive, significant role in the world, and offer him reasonable hope of fulfilling it with satisfaction to himself and to his fellow men. I suggest to you that the child with a speech problem whose voice is jarring and scarring to him and to others will not be able to attain these goals. Many children will fail because they will never be given the help to succeed. Communication skills provide the avenue to the equal opportunities for education for all children, handicapped or not. With regard to the cleft palate child, teachers of speech correction and those in the medical and dental professions are the ones who can successfully cope with the barriers that the condition of cleft palate places on the child. The proceedings of the conference contained in this brochure have been designed to be of help to the teachers in the field of speech correction who are the do-ers and the implementors for programs for speech handicapped children. The planning committee has given us a very bold program that is particularly focused on strengthening the skills, competencies, and knowledge of teachers who have the responsibilities for working with cleft palate children.

Raphael F. Simches,
Chief, Bureau for Physically
Handicapped Children

J. Sutton Regan Cleft Palate Team Presentation

Dr. William Mosher, Administrative Director.

Dr. Clement A. De Felice, Assistant Clinical Professor in Surgery, State University of New York at Buffalo.

Dr. Daniel Fahey, Clinical Associate in Otology, State University of New York at Buffalo.

Dr. William Root, Associate Professor of Orthodontics, State University of New York at Buffalo.

Dr. A. Wilmot Jacobsen, Clinical Professor of Pediatrics, State University of New York at Buffalo.

Dr. Norman G. Schaaf, Instructor in Maxillo-Facial Prosthetics, State University of New York at Buffalo.

Dr. James Ely, Pedodentist, Williamsville.

Dr. Betty Gallagher, Professor, Speech Pathology and Audiology, State University College at Buffalo.

DR. WILLIAM E. MOSHER: Today you are going to learn a little bit about the activities of the J. Sutton Regan Cleft Palate Clinic, and how we operate, and how services are rendered to cleft palate children in upstate New York. I would like to say a few words about the medical rehabilitation program of New York State, which is referred to as the State Aid Program, or used to be referred to as the Children's Court Program. The Children's Court no longer has any responsibility for this program, and the responsibility is entirely in the hands of the County Health Departments. This program is for children who have been crippled as in general malformations, birth injuries, accidents, and disease. There has to be some possibility for rehabilitation of these children, in order for them to be admitted to the program. This involves all children under twenty-one years of age in New York State. The only other condition is that the family must be medically indigent, to be admitted into the program, and the county must provide some kind of a social work service to determine whether the family is eligible. We do not use the welfare standards for this particular program. The standards are somewhat relaxed. We determine, after a casework investigation, whether the family pays all of the cost of the care, part of it, or none of it.

The services available under the medical rehabilitation program include diagnostic clinics, surgery, hospitalization, speech therapy, occupational therapy, and physical therapy, and it includes such prosthetic devices as artificial limbs. The kind of prosthetics that will be discussed this morning by Dr. Schaaf includes orthodonture for children who have severe malocclusion, and so forth. This program also cooperates with the State Education Department in that special services are provided for children who cannot get this in their public school system and have to go away to a special class, such as the six weeks program we are going to have for cleft palate children here at the State University College this summer. Here again, the county pays half of the cost of the care and the State pays the other half. The other agency involved in this program is the Division of Vocational Rehabilitation, and our department works very closely with them. After the child has been medically rehabilitated, we refer them to the D.V.R. if they need occupational training. In the last year, this program has been expanded to include certain long term diseases of childhood, such as cystic fibrosis, diabetes, cancer, and one or two other diseases.

I would like to speak, in the next few minutes, in regard to rehabilitation of the cleft palate child. As you know, this is a long and complex procedure. It is comparable to the rehabilitation process which takes place with the cerebral palsied child, with the child with congenital heart disease, or other kinds of heart disease. We are concerned not only with the appearance of the child, but with the psychological adjustment, of closure of the lip and palate, and the proper occlusion of his teeth. We are concerned with his hearing and, of course, his speech. We attempt to give these children the maximum rehabilitation possible, and today we are going to show you one of the patients in our clinic who has had excellent rehabilitation. This condition is comparable to club foot in that it is one of the most common of the severe congenital malformations known to man. Based on our information here in Western New York, and in the rest of the State, you can expect one out of 850 to 900 children to be born with a cleft palate or a combined condition, every year in New York State. New York State can expect about 388 new babies born with cleft palate every year. These children have a large number of abnormalities, and a large number of problems, and one of the first problems is the pediatric problem. We have already mentioned the surgical problem and hearing loss. We find that 50 to 60 percent of these children have some hearing loss either in their pre school years or during their school years, and we find that 50 to 60 percent need orthodontic care. Practically all of them have problems with dental caries, and all of those born with cleft palates have problems with speech. In our diagnostic clinic services in Buffalo we are very fortunate in having a large number of these diagnostic services available for crippled children. At the Rehabilitation Center at Childrens Hospital we have an amputee clinic which is comparable to this one here, with a large number of specialists involved. We have a clinic for cerebral palsied children with a team approach to this problem. We have a clinic for neuromuscular disorders and one for epilepsy, and then the Erie County Health Department runs cardiac diagnostic clinics both at the Children's Hospital and at the County Hospital, Meyer Memorial Hospital. In addition to this, we have hearing clinic services for these crippled children who are tied in with our cleft palate clinic.

In regard to the team approach of cleft palate children, the first team approach was started in Lancaster, Pennsylvania with the Lancaster Cleft Palate Clinic in 1939. Two years later, under the leadership of J. Sutton Regan, a cleft palate clinic was established here at the Children's Hospital with Dr. Regan and Dr. Ellis, one of the leading orthodontists in this part of the State: Mary Crows, a social worker, who was attached to the clinic; Miss Rothsford, of the Buffalo School System, was the speech therapist attached to this clinic; and other physicians and dentists in the Children's Hospital were also involved. This clinic usually met in the fall and the spring and children who had been operated on were called back to be seen by these various specialists. Then, in 1951, the State Health Department gave Erie County Health Department a grant to expand this clinic program, and this grant lasted for about two years, and out of this we have our present clinic service which we are going to demonstrate today.

This is a community undertaking and we undertake this with a very modest budget of $5,000 a year. We are now charging $50 for an evaluation, and it involves the Children's Hospital, which provides space and also some of its facilities in diagnosis; it involves the medical and dental school of the State University; it involves the County Health Department here in Buffalo, and it involves the State University College. All these groups are contributing to the services which are going to be demonstrated today. In addition to the medical, dental, and other specialties which we have on our clinic staff, we do give these children an audiometric test every time they attend the clinic. They have a psychological examination when that is necessary. They have the needed X-ray and other diagnostic services here at the Children's Hospital, and the new admissions have a pediatric workup. The children are referred by private physicians to the clinic, or by orthodontists through the clinic service. We have a group evaluation of every child, and this group today will show you how they will go over the case, review the findings, and decide how the child should be handled in the future. The timing of the various surgical and dental procedures are determined by this team, and often there is a discussion as to whether a certain procedure should be done. You will notice that whether it is the surgeon, the orthodontist, or the dentist, or the speech therapist, everybody's opinion carries weight in the clinic staff, and when ever there is any discussion or argument about what procedure should be done, their opinions are reviewed and considered by the whole staff.

In regard to follow up on these children, the local health departments in New York State provide follow ups to make sure that the services recommended by the team are carried out, and that the child isn't lost somewhere as far as one of the recommendations concerned. We send out to the surgeon, and the orthodontist, and to the attending physician, and to Mr. Simches, of the State Education Department, the recommendations of this clinic, and these recommendations get back to the public school system as far as the speech is concerned. We recommend how much speech therapy this child needs, for how long, and so on. So with this in mind, I should now like to introduce the Cleft Palate team, and this morning we are going to have each one of them take 3 to 5 minutes to talk about his place on the clinic team and what he does, and then we are going to present one or two cases.

To start up at this end of the table, Dr. De Felice is one of the surgeons on the cleft palate team; Dr. De Kleine, who is in the audience and will talk to you later, is the senior plastic surgeon in Buffalo. The next person is Dr. Fahey, who is our otologist on the clinic team. When we have Dr. William Root, who is one of our two orthodontists; Dr. Conant, who is not here today, is our other consultant orthodontist on our staff. Dr. Jacobsen is our pediatrician on the team. The prosthodontist is Dr. Schaaf, and he will tell you what he does, later. Our pedadontist is Dr. Charles Boyers, and Dr. James Ely, who is representing the pedadontic staff today. Miss Lee Chopic is an important member of the team. She is a public health nurse on the staff of the Erie County Health Department, and she will demonstrate what she does with the patients today in her role in keeping the clinic operating. Finally, Dr. Betty Gallagher, from the State University College at Buffalo, is our speech pathologist.

DR. CLEMENT A. DE FELICE: The plastic surgeon is usually the first of the team here to start definitive care, if you will permit me to except the pediatrician, who usually sees the baby in consultation, and says you'd better get a plastic surgeon to see about this repair. Our role is rather easily defined; it's our job to surgically return the anatomy and function of the palate to as near a normal point as possible.
Dr. De Kleine, as Dr. Mosher mentioned, is going to speak to you this afternoon about the various surgical techniques, so I will not go into them at this time.

DR. DANIEL J. FAHEY: As Dr. Moster has said, the incidence of ear problems and hearing problems among cleft palate patients is quite high. Various studies have indicated 50, 60, or 70 percent incidence of problems with hearing. As in most hearing problems in children, the type of problem is usually a conductive hearing type of difficulty. There has been some controversy in the past, and still exists in some areas, as to why this is so high among the cleft palate patients. It has been thought that because of the defect in the palate, there is contamination at the eustachion tube that contributes to the problem. It is my opinion that this is not the problem essentially, but rather it is one that we see so commonly in normal children. That is, with the hypotrophy and infection that occurs with the lymphoid tissue of children as they get a little older; along with this they begin to have trouble with their ears, like normal children do. The reason for concern about this is that the usual treatment of normal children is the removal of this lymphoid tissue, that is, removal of tonsils and adenoids. In the child who has had palate repair, there is some concern because of the possibility of regression of the speech that has been improved, and struggled with so hard and so long, with this surgical correction and speech therapy. This is certainly a definite problem in relation to correcting the situation, but with the hearing in mind there is another point of view to be taken in relation to attempting to prevent the permanent loss of hearing. With the chronic infections that we see so high in patients that have not been having the removal of the source of infection, that is the hypertrophiod infected tonsils and adenoids, the cure should be no different than the cure of children who have normal palates, when and if problems arise with the ears. If the view is taken that the tonsils and adenoids are left in, and this infection is left to perpetuate itself, then the incidence of those patients who have had cleft palate with permanent problems with their hearing will be much greater.

With this in view, the staff has acquiesced to the idea of allowing removal of the tonsils and adenoids among the children in our group. I've reviewed a series of about 500 of our cases and the incidence of significant losses at one time or another in the past is over 50 percent. In the past several years I've removed tonsils and adenoids in approximately 70 children, with a certain amount of regression of speech. However, I find it is insignificant in comparison with the amount of hearing improvement that can be obtained. In relation to the future of these children, the hearing improvement and the restoration of normal function of the ear prevents them from becoming permanent problems in relation to persistant hearing losses. With the cooperation of the staff of the Children's Hospital and the Buffalo Hearing and Speech Center we did some careful testing on a group of about 16 of these children, recording their speech and doing careful audiometry before and after. The average preoperative air conduction thresholds on these 16 patients was from 10 to 20 decibels of loss throughout the frequencies tested. The post operative improvement in the 16 patients was returned to near normal. The difference in their hearing was approximately 15 decibels, on an average in this group. The speech recordings were randomly mixed up, and the people who were experienced with listening to their speech could not tell exactly where they were in the line, pre operatively or post operatively. They were asked to score the speech on these children, and on a five point scale, they each scored the function of the speech a quarter of a point down. However, for that quarter of a point down in relation to speech regression, we obtained the 15 decibels of significant hearing improvement within a very short period of 6 weeks, which was the interval between the pre- and post-operative recordings.

This speech regression, as far as we are concerned, can very definitely, with some adequate therapy, be restored. Also, of course, future problems of consequence in relation to hearing are pretty well obviated. In relation to having a permanent hearing problem with scar and deformity and adhesion in the middle ear; that will henceforth be negated. The last point to emphasize in relation to hearing is the fact that these children, as all people with problems with their eustachion tube, are subject to much change, so that frequent testing of these people is very important because the fluctuations can be improved. They can be so bad that they have to have hearing aids. I recently had an adolescent in my office who at one time wore a hearing aid and attended a special school in Buffalo for the hearing handicapped, and improved to the point where he no longer needed the aid. After careful testing he improved, but recently unaware of this, the child had regressed and has again a consequential hearing handicap which I'm afraid is kind of late, and it's difficult for us to hope to be able to restore this.

DR. WILLIAM R. ROOT: The orthodonic problem can be roughly divided into three basic and interrelated services: guidance, orthopedics, and correction of the dental irregularities. Guidance, the orthodontist, because of his familiarity with the problems of maxillo-facial growth and development, can be of great service to the cleft palate patient by assisting the other specialists concerned in arriving at the diagnosis and treatment plan. There is a growing awareness among those interested in cleft palate correction that the judicial selection of methods of proper timing of treatment, and the sequence of various treatment phases in any given case may make the difference between success and failure. Also, since the instruments and methods and diagnosis and study of cleft palate cases are largely the same as for adaptations of the instruments and methods used in the orthodontic practice, the orthodontist is well equipped to cope with diagnostic and research problems. The beneficial effects of muscular harmony and normal function and the unfavorable effects of muscular disharmony and aberrant function are subjects that are most familiar to the orthodontist. Any unfavorable habit that tends to increase the muscular imbalance, such as tongue thrust during speech or swallowing, thumb sucking, or lip sucking, may have serious consequences in the development of the affected parts. Conversely, any activity that will encourage normal function, such as proper mastication of hard foods, blowing exercises, and so forth, may be considered to be beneficial to the development of the nasal, oral, and pharyngeal structures, and should be encouraged.

2. Orthopedics - Whether or not orthodontic or oral orthopedic appliances can guide the growth trend and change the spatial relationships of the separate parts of a non united jaw and the structures related to it has long been a controversial question. However, there is increasing

evidence that such procedures are feasible. This may be done with either a removable or fixed appliance banded to the teeth. Actually, the opening of the parts will simultaneously correct the cross bite relationship, usually without disturbing the soft tissue closure. But if the surgically closed cleft palate should be unwittingly opened as a result of such expansion, it can be corrected by either subsequent surgery or a removable plate worn to prevent the relapse of the expanded buccal segments and the closure of the opening. Scar tissue resulting from lip and palate surgery may inhibit growth, also the inherent lack of growth potential may be a factor in this. Again this can be handled best by some sort of an oral orthopedic appliance.

3. Correction of the dental irregularities: In addition to the frequent diagonal cross-bite relationship of the buccaled teeth in complete cleft palates, teeth on either side of the cleft or clefts may present severe malalignment. To correct such malalignment any variety of orthodontic appliance that the orthodontist is most familiar with may be used advantageously. In addition to the problems peculiar to the cleft condition, the patient may present any other orthodontic problems also found in non-cleft palate patients.

It is interesting to note that in a recent survey conducted from Albany, 1400 senior high school students were surveyed; 14.4 percent presented malocclusion that could be termed a handicap physically to them. Now we can expect this number to be increased among cleft palate cases. When shall the orthodontist enter the case? Present thought on this question tends to encourage participation from the time that the first phases of treatment planning are decided upon. This will not only give the orthodontist the opportunity to familiarize himself with any given case, but will also enable him to offer suggestions from his point of view. It is important that the structural parts should assume, or be helped to assume, as near normal relationship as possible from as early in life as possible. This will not only enhance chances of normal development of oral facial parts, but will also facilitate speech and social adjustments. However, it is most important not to additionally handicap the child for long treatment. Orthodontic treatment, therefore, should be instituted at a time that it can be carried out most effectively and expeditiously. The widening of the maxillary arch can be more effectively carried out while the roots of the baby teeth are still well formed, that is, between the sixth and eighth year. Severe cases of displacement may require earlier treatment. The second phase of treatment is often necessary when the permanent bicuspids erupt. In any case, it is important for the orthodontist to keep the child under observation at regular intervals from infancy, to determine the best time to initiate treatment. Early orthodontist correction will facilitate the work of the prosthodontist, surgeon, and the speech correctionist at a later date.

DR. A. WILMOT JACOBSEN: As a pediatrician, I am the only member of this team who cannot be considered a specialist in some field of rehabilitation of the cleft palate child. I must, in all cases, defer to my colleagues because of their specialized knowledge in their own fields, but there may be some advantage in having a person who is not a specialist there, because he may have a little better point of view in seeing the whole child and that, of course, is tremendously important with the cleft palate child. One of the duties of the pediatrician is to see that the child has had a complete physical examination, regardless of how we get it. We get it in different ways, but the child must have a complete examination because so many of these cleft palate children have other associated congenital defects, much higher in the general population.

We may find cardiac defects, defects of the urinary tract, etc., and we are just as eager to rehabilitate them along these other lines as we are in respect to the cleft palate itself. Certain particular points, such as obstructions of the nasal passage, which are so common in these children, the pediatrician who is seeing obstructions to the nasal passage in his other children all day long might be a little more apt to pick up allergy as a cause, something not related at all to the cleft palate itself, and to get that taken care of. There are a good many ways, I think, that a general view of the patient is helpful. I perhaps, am the one who can best appreciate what the team approach to these children means, because for 20 years I was the director of the out-patient department of this hospital, and during that time I looked up statistics once, and found out that I had seen about 500 children with cleft palates. Now we have available good plastic surgeons, good orthodontists, good dentists, good speech correctionists, etc. I don't ever recall feeling that we did a very good job rehabilitating these children. It was not because we didn't try hard, but it was because we could never get an adequate conference with the specialists. It is impossible to get four or five specialists to leave their offices and come to a point to see a cleft palate child, and as a result, each one did what he could, but he did it as a lone wolf. It was impossible to coordinate the activities of the different specialists. Now when we all sit down and talk it over, you can see the tremendous advantage to the cleft palate child and the much improved results.

DR. NORMAN G. SCHAAF: The prosthodontist makes recommendations regarding treatment within the realm of the following definitions. Cleft palate prostodontia is the science of utilizing artificial materials to fulfil three main functions:

1. To separate the oral cavity from the nasal cavity, as in the use of dental obturators to seal palatal openings.
2. To improve esthetics and facial balance as in the use of lip plumpers.
3. To reduce the air flow into the nasal pharynx and nasal cavity by the placement of a speech bulb to improve voice quality.

DR. JAMES ELY: I think first of all that I should define pedodontist for those of you who may not be entirely familiar with this branch of dentistry. A pedodontist is a specialist whose primary interest lies in the care and the treatment of the dentition of the growing child, and its problems. My function on the team consists of looking out for the general overall dental needs of the cleft palate child. As you might expect, many of the needs can be handled very adequately by the general practicing dentist and, consequently, many of the children that we see in the Sutton Regan Clinic are cared for by the general practicing dentist. There are many children, however, that require the special training of the pedodontist if we are to insure the all-important maintenance of good dental health over a long term.

There are several specific problems which we see in the cleft palate child which lend themselves to treatment by the pedodontist. One of these problems is rampant dental caries. I can define this as severe caries breakdown, or destruction of many teeth. Treatment of this problem requires an all out attack which sometimes is difficult to be found in the realm of the general practicing dentist. Another problem which we see very often in the cleft palate child is the psychological implications from their cleft palate and cleft lip, and these tend to cause dental management problems. The child cannot be handled adequately in the general office, and it is the job of the pedodontist to try to get them to accept dental treatment. My position on the team would probably be the least dramatic of any. However, I feel that it is extremely vital if the long term successful management of the cleft palate child is to be accomplished.

DR. BETTY GALLAGHER: The responsibility of the speech pathologist on the cleft palate team is first of all to evaluate the general intelligibility of the patient's speech and then, more particularly, to investigate the defectiveness, if there should be any, of consonant sounds, and to evaluate the voice quality for possible nasality or denasality, or even such a voice defect as hoarseness. In addition, the responsibility of the speech pathologist is to examine the oral structures from the standpoint of pure structure, and then from the standpoint of physiology or function. Then, in addition, to relate the structural anomalies or physiological functions to the speech differences in an attempt to seek etiological relationships between speech difficulties and the structural or physiological differences. We are also seeking to find out which of these speech differences, especially with respect to consonant sound mastery, are related not to the cleft palate problem, but rather to immaturity or to improper learning.

We need also, speech pathologists feel, to consider the intelligence level of the child and his hearing level. An important aspect of the role of the speech pathologist is to question other members of the team with respect to what plans they have for the rehabilitation of this child. It is essential to discuss with the plastic surgeon whether he plans any additional surgery, whether a pharygeal flap is appropriate, or whether prosthetic device, which we call a speech bulb, might be in order. Lastly, the responsibility of the speech pathologist is to make recommendations with respect to all that he or she sees in the speech picture, so that the speech therapist in the home environment may have a better understanding of the total picture.

Speech Anatomy as it Pertains to Cleft Palate

Dr. Joanne D. Subtelny, Research Associate,
Eastman Dental Dispensary, Rochester, New York

I would like to discuss material which I hope will be useful to you in later stages of this conference. All aspects of normal speech physiology and speech development which relate importantly to cleft palate speech cannot be discussed, simply because there is scarcely an area that could be overlooked justifiably. Dr. Gallagher's comment this morning is valid, and indicates the need to review speech in broad aspect before cleft palate is discussed definitively. She pointed out that it is difficult to determine which aspects of speech are related to the palatal defects and which ones are not. As this conference progresses, I think you will become increasingly aware that the longitudinal development and growth of a cleft palate child involves many factors which predispose that child to defective speech. These "other" factors are much more inclusive than the fact that the child had a cleft palate.

If you will review in your mind etiological factors of defective speech, you'll find that almost all of these factors can be important considerations in understanding the speech disorder of the cleft palate child. For example, we know that a large number of speech defects are based on emotional factors. In regard to the cleft palate child, there are many emotional factors that predispose the child to speech problems. Frequently, disturbed parent-child relationships are apparent. In addition, hospital experiences are part of the child's background, and these can be quite traumatic, and as such can have an appreciable influence upon that child's speech and language growth, as well as his physical growth. As was pointed out this morning, possibilities of intermittent hearing loss and significant reduction in hearing acuity also exist. Hearing deficiency then may be significantly related to the characteristics of speech produced.

Problems in auditory discrimination are recognized as very important factors, predisposing any child to defective speech. We know that the child learns to perceive or hear speech before he learns to produce speech. Motor performance is directed by auditory perception. When the cleft palate child produces sounds which are not like the sounds he hears others make, certain auditory confusions develop. Motor performance of the cleft palate child struggling to produce sounds similar to those he hears others produce then can be significantly different. Substitute methods of articulation are developed and auditory confusion is developed. All along the line there are etiological factors which require systematic evaluation when one attempts to understand why a given patient has defective speech.

None of these comments are made to de-emphasize the importance of palatopharyngeal valving. Research shows that of all factors considered, palatopharyngeal incompetence is the most consistent factor related to defective cleft palate speech. It is important, however, to remember the broad overview of speech and language development as it pertains to cleft palate speech development. In this regard, an over-all view of a communication system is helpful.

If we think of a communication system in a broad aspect, we have a useful reference for consideration of cleft palate speech. By communication, we mean simply that there has been a transfer of information from one central nervous system to another. In this system, there are four component parts: The first is the source of the information, which is the central nervous system of the speaker. If communication breaks down now, it may be because the speaker does not have the necessary information stored within his central nervous system. The source of the information, then, is in the speaker's brain.

Information is transmitted to the vocal apparatus in the form of neural activities. The speech machinery of the speaker then changes the neural activities into sound waves. This is accomplished by laryngeal function and modification of sound that is produced at the level of the larynx. The vocal tract, then, is the second component part of the communication system and is called the transmitter.

The third component part is termed the channel, which connects the speaker's speech machinery with the ear of the listener. The medium in this instance is the air which propagates the acoustical disturbances that I create here to your ears as sound waves. The acoustical waves are then reconverted into neural energy at the listener's ear and reach the final destination in the listener's central nervous system. In summary, we have the central nervous system of the speaker, the transmitting apparatus which is the speech machinery, the channel (air), and finally the receiver or auditory mechanism of the listener and his central nervous system, the final destination.

Why should this concept of communication be discussed? Simply because the system concept demonstrates that the speech machinery is modified as we're talking. Our ear continually modifies the motor performance of speech. This statement cannot be overemphasized. Indeed the correction of any speech defect from the physiological viewpoint requires preliminary training of the auditory monitor. The auditory feedback which monitors neuromuscular activity must be " corrected " before a consistent modification in speech physiology can be expected. Primary emphasis to correct all speech defects conventionally has been on ear training.

This concept is worthy of stress in any discussion of cleft palate speech. During early stages of physical management, a cleft palate child is attempting to produce speech. The sounds he is producing are seriously defective, and yet these defective auditory patterns are continually feeding back into his speech machinery. Is it any wonder then that the child soon is unable to discriminate " good " sounds other speakers produce and the sounds he produces? Is it surprising that general approximations of phonemes tend to become the modus operandi in the articulation process? The obvious clinical implication of this concept is one which emphasizes the extreme importance of early treatment to provide requisites for reasonably normal speech development at the time of active speech learning.

In addition to auditory function as it applies to speech in cleft palate individuals, other processes involved in speech merit some comment. These are: respiration, phonation, resonation, and articulation. In terms of these processes, significant features should be pointed out as they apply to speech produced by a child that has had a cleft palate.

Our interest in respiration pertains to its effect upon laryngeal function and to the fact that the direction of the breath stream through the nose or through the mouth is dependent upon the position of the velum and the valving in the palatopharyngeal region. By the contraction of the thoracic muscles, the ribs elevate and roll outward. This increases the volume within the thorocic cavity. The active muscle phase is inhalation (the volume of the thorocic cavity is enlarged) and with relaxation of these muscles, volume is decreased and air is exhaled.

From a speech point of view, we know that this respiratory exchange has a great deal to do with laryngeal activity. After inhalation, the vocal folds close over the aperture of the air channel; however, when pressure builds up below the vocal folds to a certain point, the vocal folds are forced open and a pattern of activity is established. The vocal folds do not burst into a vibratory pattern until the pressure below the glottis is raised to a critical point. If the folds are moving faster than 16 cycles per second, then their activity results in sound production that we can hear. So it is that respiratory function is important in its relationship to laryngeal behavior.

Dr. Van Hattum's study of air usage in cleft palate patients showed that cleft palate patients, who are unable to valve effectively in the palatopharyngeal region, develop compensatory patterns of air usage. Speech breathing and laryngeal function can be quite different in the cleft palate speaker with palatopharyngeal incompetence. The classic speech sympton of palatal deficiency is the glottal stop substitution for voiceless plosives. The stop is produced by firm closure of the vocal folds and then abrupt release, thus producing a voiceless stop. Instead of producing "pap" with bilabial closure, or "tat" with lingua-alveolar closure, the cleft palate patient, who cannot implode pressure in the mouth because of air leakage through the nose, will produce the stop at the level of the glottis.

This common clinical observation of compensatory articulation is used to emphasize the fact that cleft palate speech must be considered in broader terms than palatal activity. The respiratory pattern itself can be modified to compensate for the patient's inability to control the breath stream during speech. The activity of the vocal folds may be modified because of the speaker's inability to modify oral-nasal air flow and pressure in proper units of time.

The broad reference of understanding is mandatory in planning therapy for the individual. Consideration of one restricted area such as the palatopharyngeal mechanism would simplify cleft palate diagnosis. It would also simplify speech training but that cannot be done. When the situation is understood comprehensively, it is evident that a blueprint for cleft palate speech therapy cannot and should not be projected. Cleft palate children are very different in morphology and in speech. They differ in terms of the degree of cleft at the time of birth. The cleft condition itself is variable in its extent, in width, and in tissue abundance of adjacent structures. There are other differences in velar function which are apparent preoperatively, and which are becoming more adequately documented as time goes on. There are also differences in pharyngeal dimensions and in pharyngeal muscle activity. Since the palate works in conjunction with the pharynx, some of the variables observed are highly significant and they continue to fascinate and perplex the clinician and the researchist.

We sometimes think of the pharynx as round in shape, when actually it is flattened in the anterior-posterior dimension. For cimplicity in gaining appreciation for the importance of the pharynx, it is useful to think of the soft palate as a door, with the pharynx as the frame for the door. We are right in referring to the door and frame as palatopharyngeal valving because the amount of air traffic passing through the door and frame depends, not exclusively upon movement of the door (velum) but rather upon the combined activity of the palatal and pharyngeal muscles which constitute a variable frame for the door. Together, the velum and pharynx determine the effect of valving.

When palatopharyngeal incompetence exists, excessive air escapes through the nose, which is easily identified as nasal emission, and excessive nasal resonance is apparent. How much palatopharyngeal opening caused these defects in speech is not determined exclusively by velar size and movement, but rather the size of the palatopharyngeal gap after the combined contraction of palatal and pharyngeal muscle.

If we are to account for the draft that is coming through the nose, we need to consider the size of the door, how far the door is open, and also the size of the frame in proportion to the door. It is comparatively simple to determine deficiency in movement and length. However, study of pharyngeal constriction associated with velar movement is more difficult, yet very necessary in speech diagnosis and treatment planning.

As speech people, we should be mindful that sometimes a realistic appraisal of valving adequacy cannot be made simply by looking at velar movement. Palatopharyngeal deficiency is not always present when a velum appears short. Valid and reliable judgements of valving adequacy are difficult without an X-ray film showing relationships between the soft palate and the pharynx during speech. Certainly the best judgements about palatopharyngeal incompetence are made when critical oro-pharyngeal examinations, X-ray study, and speech examinations are combined. Our ears, if trained appropriately, should be able to identify symptoms of palatopharyngeal deficiency, but in order to determine the degree of deficiency, and perhaps more importantly whether or not a speaker has the potential for adequate valving and is not using it, X-ray study is required. The X-ray is also important in defining the degree of movement in the posterior pharyngeal wall. Whereas, activity in the lateral walls of the pharynx can be observed without X-ray, activity in the posterior wall many times cannot be appraised.

Opinions differ today as to what muscle is responsible for the anterior bulging in the pharyngeal wall called Passavant's ridge. It can be visualized in some patients if the velum is very short. In other patients with more abundant velar tissue draping down, Passavant's ridge cannot be observed by a priori examination.

Since a well ordered course in speech correction must be developed in accordance with an individual's physiological potential to improve speech, diagnostic procedures providing palatopharyngeal information are extremely important. To illustrate, the prognosis for elimination of glottal stops is extremely poor if the speaker has marked palatopharyngeal deficiency. With a slight palatopharyngeal deficit and good therapy, glottal stops and pharyngeal fricative substitutions can be corrected and therapy should be planned in accordance. In order to make intelligent decisions relative to speech therapy and in regard to referrals to other specialists, information provided by your ears, and cephalometric films is of extreme value.

The Cleft Palate Patient and His Speech

Dr. Joanne D. Subtelny

In early 1950's, the character of speech literature pertaining to cleft palate began to change. Organized research efforts to seek and quantitate causative factors related to defective speech began to appear, and less energy was expanded in describing cleft palate speech characteristics per se. Stated in the positive sense, the last ten years have reflected increased interest and work:

1. To establish interrelationships between various measures of nasality, articulation, and intelligibility in cleft palate speech;
2. To develop refined methods for evaluation and measurement of disordered speech;
3. To study quantitatively defined speech characteristics in relation to the physiology of the speaker.

The major emphasis in this regard has been upon defining velopharyngeal dimensions during speech, and the character of speech produced. Studies attempting to clarify relationships between articulatory errors and nasality in cleft palate speech and associated physiologic factors seem particularly important for several fundamental reasons.

1. Although palatopharyngeal incompetence is well established as the primary cause of cleft palate speech pathology, it is not the only etiologic factor in disordered cleft palate speech.
2. Defective cleft palate is extremely complex in its outer strappings or perceptual attributes. Hypernasality as well as defective articulation are evident. Some of the speech deviations are related directly to deficiencies in palatopharyngeal function; others may be indirectly the result of palatopharyngeal deficiency; still other deviations in speech may be completely unrelated to palatopharyngeal dynamics.

Because a variety of factors may be causative when defective speech exists, the speech diagnostician assumes the task of studying various isolated factors to determine their relative significance to the total speech pattern. The speech specialist also strives to determine which specific defects in speech can be improved or corrected through an intelligent, well-organized course of speech therapy, and which characteristics of speech cannot be improved appreciably without medical or dental services to improve the anatomic physiologic potential of the speaker.

In considering disordered speech of the non-cleft as well as the cleft palate speaker, it is not assumed that all observed defects of speech have their basis in organic factors. When cleft palate is part of the speaker's background, the tendency frequently is to attribute all articulatory defects in speech to the palatal anomaly. There is, of course, good reason for this tendency, but there are other important causative factors which may be equally important in achieving a comprehensive understanding of disordered cleft palate speech.

For example, defective patterns of coordination in speech frequently are developed or learned during early phases of physical management of the cleft palate child. These patterns may persist as habits when the anatomic physiologic basis for their development no longer exists. To illustrate, glottal stops (laryngeal valving) may develop as substitute methods of producing sounds such as /p/, /k/, and /t/. During early phases of physical management, the child with palatopharyngeal incompetence may be unable to achieve sufficient intraoral pressure for satisfactory production of these sounds. As a result, substitute methods of producing these sounds develop. At later stages, glottal stops may persist in speech, although the speaker has the anatomic and physiologic requisites for normal sound production.

There are other factors which may contribute to defective speech in cleft palate patients. Some of the "other" factors may be amenable to training or specialized help. Lack of speech stimulation, auditory deficiencies, emotional disturbances, problems in auditory discrimination and in learning are examples of other possible etiologic factors relative to defective cleft palate speech. The possible factors require systematic exploration if an adequate speech examination is to be made.

It is often difficult to fractionate or isolate component characteristics existing within the total speech pattern of cleft palate patients. Despite the difficulty involved, an organized and fractionated analysis of speech should be made. Secondly, an attempt must be made to relate what is heard with what is seen, so that intelligent decisions can be made as to the physiologic basis for defects observed. Speech therapy as well as other therapeutic endeavors must grow out of, or be based upon organized diagnosis. If speech re-education is to be successful, therapy must have direction. To achieve direction in therapy, much more is involved than a phonetic accounting of the number and types of misarticulations. Patterns of movement which are incorrect or missing in the speaker's repertoire of coordinated speech behavior must be identified. Muscles or groups of muscles which need strengthening or retraining, require recognition. This type of information is required to determine which exercises, and which sound sequences, should be stressed in therapy.

Since there is usually a causal pattern rather than a cause of disordered speech, the responsibility of the speech diagnostician is to determine how much of the speech disturbance results from palatopharyngeal deficiency or other organic factors, which will not change with speech therapy alone. This responsibility must be accepted by the speech specialist, particularly when the speech evaluation has been requested to determine whether or not the patient should have further surgical treatment to improve palatopharyngeal function. Arriving at a confident decision that palatopharyngeal incompetence is a primary cause, a contributing or unrelated factor relative to defective speech, requires:

1. Appraisal of other potential factors which may be causally related;
2. A realistic concept of minimal physiologic essentials for adequate palatopharyngeal valving; and

3. Careful study of the speakers palatopharyngeal function.

The statement as to whether or not palatopharyngeal competence for speech exists in a given patient should come from a speech person. Also, a rather definitive speech prognosis with and without further modifications in palatopharyngeal area should be formulated. Whether or not the minimal requirements can be established in a given individual case by surgical or prosthetic treatment, is a decision for the medical or dental specialist who does the work. These specialists recognize anatomic and physiologic assets and liabilities of a patient which usually are not comprehended fully by the outsider.

With this background, the rationale for concentrated study of palatopharyngeal function, and associated characteristics of speech, should be evident. Many investigators have applied still radiographic techniques to define palatopharyngeal relationships. In retrospect, consecutive research efforts have shown continuous refinement in experimental design and procedures. In most instances, new information has been obtained.

In early speech studies, subjects were grouped cleft and non-cleft. At one time, such gross categorization of patients was considered to represent homogeneity relative to the character of speech produced. Subsequent research, however, has defined tremendous variation in the morphologic features of the cleft palate patients and in the characteristics of cleft palate speech. Such variation indicated a need to revise methods of grouping cleft palate patients, particularly if the purpose of the investigation is to define physiologic factors related to defective speech.

According to contemporary standards, use of the term "defective" is much too broad to be useful in grouping subjects for speech study, particularly if physiologic interpretations are to be made. Happily and honestly, it is no longer assumed that every cleft palate patient will have defective speech. Recognition of these factors has lead to considerable change in research methodology.

Some years ago, a study was undertaken to investigate the physiological basis for hypernasality in cleft palate speakers. In order to separate hypernasal speakers from less nasal cleft palate speakers, samples of continuous speech and sustained vowels were tape recorded for each subject. Mid-sagittal laminagraphic X-rays were taken during the sustained vowel production, so that physiological factors could be studied.

Judgement ratings of the degree of nasality were secured by playing back the recordings for evaluation by a panel of three phoneticians. The results of quantitated judgements of nasality showed marked variability in nasality ratings among cleft palate speakers. This finding served to emphasize the error in grouping cleft palate subjects and considering them comparable in speech or quality characteristics.

Differences in degree of nasality were also found to occur as a function of the type of speech material played for judgement rating. For example, sustained vowels of cleft palate individuals were judged to be much less nasal than samples of their continuous speech. It also became evident when normal and cleft palate speakers were compared, that differences between the groups were more apparent for some sounds than for others. Nasality judgements based upon sustained phonation of the vowel /ah/ showed there was considerable overlap in degree of nasality between normal and cleft palate speakers. On the basis of this finding, sustained production of vowel /ah/ is not recommended as the best vowel to use if an estimate of nasality is desired. Vowels /i/ and /u/ are much better choices if the purpose is to gain an estimate of the relative degree of nasality.

Normal production of closed vowels /i/ and /u/ requires a greater degree of velar elevation and retraction than is required for production of open vowels /a/ and /ai/. These facts provide a physiologic basis for the finding that vowel /a/ was produced quite well (with little excessive nasality) in the cleft palate group.

Parenthetically, sustained phonation of vowel /a/ is recommended in speech evaluation simply because it is an open vowel which gives an excellent view of the palate and adjacent structures during speech sound production. In such evaluations, the examiner should remember, however, that his observations of palatopharyngeal activity do not reveal the degree of velar elevation and retraction which is required for closed vowel production.

The greatest difference between normal and cleft palate speech quality becomes apparent during continuous speech production. For this reason, samples of continuous speech are recommended to appraise nasality in clinical speech evaluations.

The nasality judgements summarized were obtained to make it possible to select from a total cleft palate sample, certain cleft palate subjects who were definitely hypernasal. This group of hypernasal cleft palate speakers were then compared with non-cleft speakers with normal voice quality. In this way, two groups were established which were grossly differentiated on the basis of nasality. The X-ray film of these respective groups then were subjected to a comparative physiologic analysis.

The results of analysis showed that the hypernasal cleft palate individuals had definite deviations in resonating relationships, which were measured as oral and pharyngeal cavities and apertures. Velopharyngeal deficiency was not the only consistent source of deviation in hypernasal cleft palate speakers. Other factors which were just as consistent as velopharyngeal deficiency in the hypernasal cleft palate group were:

1. Shorter oral cavity dimensions;
2. Lower angular positions of the velum;
3. Lower hyoid positions;
4. Lower vertical tongue postures; and
5. Aberrations in the horizontal adjustments of the tongue within the shortened anterior-posterior dimensions of the vocal tract.

Although this study represents an improvement over some previous research efforts which grossly group cleft palate speakers, the value of the study is not one of having provided objective statements of isolated structural positions during hypernasal vowel production. The results enumerated assist in understanding how the total vocal tract is influenced by the structural defects commonly observed in cleft palate subjects. A variety of atypical structural relationships were found to co-exist with the palatal defects in hypernasal speakers. Physiologic and anatomic defects of the palate were found to be associated with significant differences in posture, which resulted in marked differences in resonating relationships for every vowel studied.

Compositely, the atypical physiological relationships described are considered evidence of compensatory adjustments. The vocal tract of the cleft palate individual is basically a physiologic system which functions with one or several defective parts. It has been known for a long time that a physiologic system, which functions with defective parts, shows evidence of compensatory adjustments of specific organ structures within that system. Physiologists have explained that compensatory adjustments are observed because the behavior of a part is not solely determined by its own properties, but is controlled and directed by the system as a whole. The physiological differences between hypernasal cleft palate speakers and normal speakers provide evidence that this type of phonomena occurs in response to a defective palate during speech function.

In totality, the results of this study are interpreted as evidence that the total speech producing mechanism of a cleft palate individual is functionally integrated and responds in a wholistic manner to its peripheral defects of the palate and the sequellae resulting from the early embryolic mishap. The system was found to be functionally as well as structurally different in many ways from the normal mechanism. The total speech producing system of hypernasal cleft palate speakers might best be considered as geared to the palatal defect.

Certainly, the results described verify the presence of velopharyngeal inadequacy during nasalized vowel production, and no attempt is made to minimize the importance of palatopharyngeal incompetence. However, the other deviate physiologic relationships which were observed are important to recognize, and suggest important clinical implications.

Early therapeutic measures to surgically or prosthetically obturate the palatal opening should be encouraged. The need is also to maintain a near normal oral environment for lingual function.

Since it is known that the establishment of the coordinated neuromuscular pattern of speech occurs during a rather defined period in normal children, pre-school treatment designed to improve physiologic potential for speech acquisition in cleft palate children is strongly indicated. With the recognition that it is difficult clinically to modify speech patterns once they have become established, the importance of early provision for speech is again emphasized. If, by the second or third year of life, a fairly normal oral condition can be established, compensatory adjustments are discouraged, and more normal function may be anticipated to facilitate speech learning.

A child learns to perceive speech sounds and then tries to produce them by imitation. Success in making an acceptable approximation of a speech unit is rewarding; the child repeats rewarding behavior and improves the sound. Perfecting a sound or learning to produce a sound adequately is influenced to a great extent by the relative success a child experiences in initial efforts.

The child with normal structures achieves success with relative ease. However, the cleft palate child with defective structures struggles with less favorable circumstances. His rewards in sound production represent at best, partial success. His motor performance is many times rewarded by severe distortion of the sound attempted. The imperfect matching of his own speech efforts (auditory feedback) with those he attempts to imitate, tends to discourage continued initiative in speech learning, and to adversely effect auditory discrimination. Both results may prove to be influential factors in retarding speech mastery. With these considerations in mind, early structural improvement is recommended as a real advantage in speech learning.

Another important aspect of learning speech is having maximum use of tactile and proprioceptive sensations which are active during motor activity. The sensory feedback, which is in continuous operation, furnishes information to the central nervous system so that a precept or a feeling of speech movement can be associated with the auditory precept of that movement. This constant feedback of simultaneous auditory and tactile, proprioceptive information is thought to establish a multisensory precept of movement. Thus, in addition to the auditory character of sounds produced, there are other significant neural factors to consider in early speech development of cleft palate youngsters. The richest supply of nerve endings for discreet sensation in the tongue are said to be found in the region proximal to the tongue tip. In the palate, the richest supply of nerve endings for touch perception are found in the upper anterior surface of the hard palate and along the alveolar ridge.

When the architecture of the oral cavity is normal, this distribution of sensory nerve endings seems ideal to facilitate speech learning. However, when the anterior portion of the oral cavity is severely distorted and constricted, the situation may be very different. It is probably that full utilization of sensory feedback does not take place in situations where there is marked maxillary constriction, and tongue tip contact cannot be achieved in the usual way.

One of the most consistent observations of speech in young cleft palate children is that they do not use the tongue tip in the usual specific manner, but substitute grosser movements utilizing the dorsum of the tongue. Some of this may be the result of deprivation in sensory feedback. Some of the basis for this observation may also reside in the fact that functional movements of the tongue during sucking and swallowing may have been different. Since muscle functions in utero, some of the differences in the functional behavior of the tongue may be of long standing in cleft palate youngsters. From a research viewpoint, this possibility would seem worthy of cine-radiographic study. From a clinical viewpoint, observation of tongue behavior in cleft palate youngsters hold implications for rehabilitative planning.

Changing structural conditions to approximate the normal is believed helpful in encouraging more efficient and rewarding tongue usage. It may well be that training and time will be required before basic functional patterns are changed, but improvement of structural relationships is considered to facilitate the learning of more normal function of the tongue. Architecturally, the child would appear to have more complete use of sensation essential to monitoring, and subsequently refining precise speech behavior. Another very important advantage to be accrued from improvement in structural relationships pertains to the fact that such change may make an appreciable difference in the auditory character of speech produced. Thus, structural improvement helps to prevent the auditory confusions which are inevitable when appreciable differences exist between the character of the sound the child produces himself and those he hears others produce.

Surgical Management of Cleft Palate

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Not only in medicine, certainly not only in cleft palate work, but in all fields of science, there is an unfortunate gap between the research technical detail work, and the practical people that are putting them into application. It's that gap that we always have trouble with. I'm goint to try, if possible, to correlate these a little for you.

First of all, in talking about the medical aspects of cleft palate and cleft lip, we must put the two together. Let's ask the age old question that every parent asks us, "What is the cause?" Obviously the answer is that, in so far as most human cases are concerned, we don't know. In laboratory animals, it's a very simple matter to create these and other congenital defects. We can take lower animals such as fish in little glass dishes of water, we can take pregnant animals, laboratory animals, mostly rodents, and by giving them almost anything which might conceivably damage an embryo, we can damage that embryo and create various defects. We can even time them so that if during a certain phase of pregnancy in a rabbit, we give a certain dose of X-ray, a certain poison, or nutritional deficiency or something of this nature, we can say that we are going to create certain defects, the ones that are developing embryologically critically at that time. However, the things that we have to use in laboratory animals are far more severe then could possibly happen very often in the human race, and in particularly civilized areas. Once in a great while we see something like this that does occur. I remember one nurse from Children's Hospital. She was overcome with carbon monoxide gas in her first month of pregnancy. Certainly this was a damaging agent that would damage any embryo. We know there are many hereditary cases. Whether that is the actual etiological factor or whether they are more susceptible to some damaging agent is pretty hard to say. But we do see these, as all you that do work with cleft palates are familiar with. They do occur multiple in the same family, brothers and sisters. They may spout out occasionally, an uncle had one, or grandfather had one, and yet in the vast majority of cases we cannot trace any family history of this or any other congenital defects.

There are some people who are rather rabid on the subject, who swear if we could trace it back enough thousands of generations, that we could find some tendency in all of them. On the other hand, I think that we're perfectly safe in advising parents that unless there is a family history within the traceable range of the past couple generations, their chances of having a child born with this type of thing, is no greater than the general population. However, if they have any history within the past two or three generations, I think that we cannot console these parents, because these people do have a greatly increased incidence that we have to warn them about.

I should say that there is research going on today in which I think we're getting closer and closer to the solution. I might also mention the fact that rubella or German measles, which is a very mild virus disease, so mild we hardly know most people have it since it doesn't even make you sick in the majority of instances, if it occurs in the young pregnant mother at the proper time, will cause many congenital defects. There is a great deal on the horizon at the research level. It looks now that with all this work being done on the synthesis of proteins as it occurs in the biological world, that there is some disturbance directly affecting many congenital anomonalies. I think the time is coming where we will actually be able to advise the young married people on how to prevent, or lower the incidence of some of these conditions. I think we're getting that close to it. Almost anything that damages an embryo can cause congenital defects, and so one of the first points I want to make in dealing with these children, with this or any other congenital defect, is that whenever you have one congenital defect, be on the lookout and expect others. A case came to us with a double cleft lip and cleft palate. If you were to raise the eye lids, you'd find that the iris had a little cleft or split on either side. There was a lobster type deformity, or claw-like deformity of both hands and feet. At the base of the spine there was a defect known as spinal bifida. There's a wide range of associated defects that occur, a few of them rather commonly with cleft palate, such as the micrognathia or short jaw. That, for the most part is a growth problem that takes care of itself, at least partially. Other associated defects in the immediate area of the palate, facial clefts, abnormalities of the cheek bone, ears, etc. But they are not infrequently associated with mental retardation and defects in all other parts of the body, so be on the lookout.

Even though we don't know much about the etiology of cleft lip and cleft palate, or other congenital defects, we do know a great deal about the embryology of how these structures are formed in the embryo, and what stage of the mechanism goes wrong in creating these defects. In the face of a human embryo at about a month, the mouth, nose, sinuses etc. are a series of finger-like processes growing out around. The mandibular processes come to the mid-line, meet and fuse in the midline. The maxillary processes come down under the eyes. The nasal-frontal processes coming down from above with numerous sub-divisions. This nasal-frontal process is going to form the nose. The central part of the upper lip known as the philtrum and the little section of the upper jaw, the pre-maxilla will contain the four incisor teeth, whereas the maxillary process will form the balance of the upper jaw, the palate, most of the upper lip and most of the cheek. If, for any reason, these processes in coming around together, fail to get together and grow and stay together we're going to have a cleft or a split remaining. The concept not too many years ago was that they failed to get together and grow together. This we now know is not true. In practically all instances where they've been able to catch early embryos and study this thing, we find that these clefts do close, but do not stay closed. The reason behind that is fairly simple now that we know it, but it didn't seem so simple at the time. The cheek or lip is formed embryologically from three basic tissues. One will be the covering of the outside that will form the skin which is known as the ectoderm epidermis, one that will form the mucous membrane, the lining, and in the embryonic stage that is known as the endoderm, and inbetween those two, the mesoderm. The mesoderm is going to be skeleton, the muscles, the fibrous things that hold all of us together, and it is going to be the recipient side that carries blood vessels and nerves. What happens to these embryos is that something that is commonly part of normal embryology, especially in lower animals where nature wants to put a split, a cleft in anything, mesoderm is not formed. If there's no mesoderm, there can be no blood vessels, no nerve supply, which is essential to the life of that tissue and to its function, and if mesoderm is missing or extremely deficient, this cleft occurs. Now this is just an instance of where this lack of mesoderm occurs in places. It's not supposed to in normal embryology, and because it can develop no nutritional status to it, and not the proper nerve for function, etc., those tissues degenerate and break down the once closed area with a little thin, web-like things, and a cleft exists. That is the pretty well known and accepted mechanism of the formation of clefts today.

Let's take up the problem of the cleft lip. I do want to point out at this point that the cleft lip is primarily a cosmetic defect, whereas the palate is primarily functional. In other words, you don't see the palate, it causes the patient no embarrassment because of what you see, only because of what you hear. It effects the individual in the functional thing, there is no serious important function that's interferred with. This is largely a matter of the psychology of the individual of having such a grotesque appearance. A young lady I recall is a good example. She grew to adulthood without having a cleft lip and palate repaired. She quit school; she wouldn't take a job; she went without any social activities. She could hardly be gotten to the store to do the shopping. She became an almost total social recluse because of her appearance. As soon as this was repaired, she became quite a personable young lady. This is a very important point for you people who handle these children to realize. We get so excited over the functional things, trying to be scientific, that we forget that in many instances the problem that bothers the child the worst, if he has the lip defect associated with the palate, is his appearance. We let these children decide how far they want to go in cosmetic reconstruction, according to how badly it bothers them. In most of them, there's not much question. They wouldrather have their face fixed up to look nice, than they would to have their hearing corrected, or make their speech better, or anything else. This is the thing that really bothers them, in the majority of them. Paying attention to this is extremely important. We get so intense over the one thing we're driving at, to get the best speech, or get the hearing cleared up, we forget about these other facets which are equally important, or sometimes more important, to the child. Doing the best possible cosmetic job on them is one of the important jobs that we are faced with.

The single cleft lip appears at the time the child is born, with the flattened nostril, the cleft in the alveolus, and all of these difficult features that go with it. In the double cleft lip we have that additional problem of two clefts that have to be repaired. But we have the peculiar situation of the pre-maxillary section in the prolabium, the central portion protruding way out forward. When you have the double cleft of the lip and the alveolus, then continue to a longitudinal cleft in the palate, a "y" shaped cleft, you realize there can be no attachment of that pre-maxilla or lip, pro-labium, on either side or behind it, and the only place it can be attached is upward on the tip of the nasal septum, and instead of being in its normal position as it should be, it is protruding way out forward and makes a much more difficult problem out of this.

I don't want to go into surgical technique, this part of it would be of not much interest to you except to point out general principles among the various things, as to how it might effect the child, or your work with them. The basic principle of all lip closures is merely to create two raw surfaces on either side of the cleft, and then freeing the lip by dissection underneath, so that those two raw surfaces can be brought together without too much tension. A straight line closure, the simplist of all closures, is rarely used today. Today practically all of our closures involve some fancy geometric patterns in which either the scar will zig-zag back and forth somewhat horizontally across the lip like the letter "z", or the most popular ones today where the scar comes down from the floor of the maxilla about two-thirds of the way, then across toward the midline, horizonally, and then either straight or diagonally travels down to the lip margin. The reason for those fancy geometric patterns is very simple. After the scar heals it always shrinks and contracts. If it is off center, even though we leave a little excess on the lip margin to allow for that shrinkage, some of that is going to shrink, not enough, but more than likely it is going to shrink too much. And so it winds up rather asymmetrical. By placing some of the scar horizonally we balance the up and down pull of the contraction of the scar, with the horizontal pull which is not as undesirable, and by finishing up our incision more nearly to the midline to the upper lip, at least if there is going to be some contracture, it creates not as much difference between the two sides. So you rarely see a straight line closure used today. That is the basic principal of it.

One of the big problems in all facial surgery is the avoidance of stitch marks. If we use ordinary surgical sutures like they use for the abdomen or other places, you wind up with these ladder like stitch marks across the wound which is often more conspicious than the balance of the scar. And so all these closures are done with tiny sutures. We try to keep them clean and dry with nursing care, to avoid infection around. To hold the lip together for a long healing period there are heavier sutures used entirely on the under surface of the lip, where they can be left in until wound healing is more complete and where stitch marks are of no consequence because they are concealed.

The question comes up as to the age at which surgery should be done. This is one of the many fields in which there has been a lot of argument among plastic surgeons and other people over the last two or three generations, particularly the last two, and while this development of cleft palate management has been going on, this has been an extremely controvercial field. We don't know all the answers today or we wouldn't still be arguing, and people are trying different things to see if we can't make the results a little better. If we had one thing that worked perfectly we'd all use it, without any question, and yet the field of controversy is very rapidly narrowing down in the more recent years. Regarding this age of operation, we would like to do the lip, palate, and everything else as early as we can, and in the case of the lip, we can. There is almost no disagreement that, with minor variations, the lip should be closed just as soon as it is feasible after the child is born. Which means it can be done pretty early in most cases, unless they have some serious heart condition or something that would otherwise interfere. How early is it feasible and practical to repair these? Well, it varies a little bit with the situation but, basically, it depends on whether the surgeon uses local or general anesthetic. The majority of surgeons who use general anesthetic have to wait until the baby has recovered from birth shock, until he is a safe risk for anesthetic for this type of surgery. This generally winds up a matter of three or four weeks. Those of us, probably in the minority, who prefer to do these under local anesthesia try, if possible, to perform them in the first ten days of life when the baby has little, if any, of true pain sensation, and economically and in very other way it is very nice. Why are we so anxious to get this done so early? Two reasons: One is scientific, one humanitarian. The scientific reason is that babies with the widely cleft alveolus often do not have a normal "U" shaped bony ridge, where the teeth are going to be later on, and not only for proper dentition, but shape of the face, it is very important that they do have a "U" shaped dental arch that matches the lower jaw.

A couple of generations ago, the great Dr. Brophy, one of the world's greatest oral surgeons, conceived the idea that we'd have to put wires through the jaw as soon as they were born, and compress and force these together. Because they didn't have teeth, he was putting the wires through the jaw. That procedure, during a great many years, looked like it was very fine until these children grew up, and they got into their teens. They found these wires had created so much damage to the growth of that upper jaw, damaged so many of the tooth buds of the adult teeth, that the whole thing had done more harm than good, and because of that, unfortunately, a great man's name is going down in history where nobody wants to mention the name of Brophy in oral surgery today. Yet there are many things he did which were outstanding developments in this field. This procedure was abandoned entirely. I know of nobody who does it anymore. The answer to it was so simple that nobody thought of it. These children did have teeth; the orthodontic people could very easily fasten some bands around them, and connect them up with some rubber bands or springs and work this around. When the baby is born, his upper jaw is so soft and springy. It isn't true bone as you know it in an adult; it's half cartilage and half bone. You can actually spring it with your thumbs. It's now well know, an established principle that everybody fellows, that if you just close the lip early enough, just the pressure of this lip and it's muscular motion will do exactly as these rubber bands would have done in orthodontia. It will swing that alveolar ridge right around until the two sides come together in a more or less "U" shaped dental arch. The time period varies from just a few weeks to a year and a half, ususally about 3 months, but extremely variable. It swings around and makes a pretty good U-shaped arch. Once in a while it doesn't quite get together. Much more commonly it does this thing that we don't like to see happen, which is involving a lot of things today in dentistry and surgery. It gets too far closed and an overlap or cross-bite results. It collapses in the transverse plane and one gets locked outside of the other. The prevention of this is an important thing. It is still not entirely the answer. There are several techniques by which this is done. So this is the scientific reason, to close them early, to get that approximate U-shaped dental arch, with which dental people, etc., later on can finish up the job to get the dentition and the shape of the face and jaws approximately correct for these children.

The humanitarian reason for this is just as important in my opinion. These children are born with these hideous deformities, and to young parents it is a terrific mental and emotional shock. The quicker we can get that lip closed and have this look more like a human face, even though it's far from being perfect yet, the more heartache we can save these young parents. If there were no scientific reasons whatsoever, as long as it is feasible and practical to close these lips early, it should be done for that reason alone. In the double cleft lips, it's the same problem except there are two clefts to close. We do have more failures with them, and we don't know all the answers to this one yet. We also have the job of getting this premaxilla back in position. Even after we weren't with the single clefts, it was still felt that we had to do some resection and push that pre-maxilla bone back into where it belonged in these doubles, in order to try and create our approximately U-shaped arch. There again, the growthdamage was so great, as these children grew up, that you wondered if you weren't creating more deformity than you were correcting. So this has drifted in the same direction, and today I think more of these cases are handled just as we do the singles. We close the lip over it and hope. This creates a problem, because it sticks way out in front, it looks like heck. There's a lot of tension on it, where if you get any mouth infection, which you are always combating in this type of surgery, you're going to have more breakdowns and more trouble. Even if you have a successful closure of the primary surgery, the tendency of that pre-maxilla to drift back into its normal position in the dental arch is just not anywhere as near as great as it is in the single. They may not go back at all, they may go lop-sided, they may do all sorts of things. It creates quite a problem. However, we still feel that we don't wish to do any damage to growth, and even though it is not the way we'd like it for the dental arch, at least it gives them a full face which has some shape to it. At a later age, it can be corrected by various surgical and dental procedures.

The next step in the surgery of these children is the repair of the palate itself. Here again we talk of the problem, as to what age these should be repaired. Here's where the argument comes in. Insofar as speech and function are concerned, we would like to repair these and put them in their best anatomical and physiolocial condition as soon as we could after the child was born, but this is totally impractical if not impossible, for a least 3 reasons. 1. The mortality of surgery in this part of the throat, even today, is high, particularly if it's done in children of early infancy age, and we just have to wait until it's a safer procedure. 2. The tissues that are used to close the palate are thin, flimsy things in the new born infant; the clefts are very wide, and if you put any tension on a closed palate you're just not going to get it closed. It's going to break down with mouth infection, and so it is almost impossible to get closure if we do it that early. We have to wait until those tissues have toughened up or can stand a little more, and until growth has occurred which will actually grow out and make that palate narrower, as the child gets older. 3. If we were to repair them at that early age, we would be pulling so much tension by the scar tissue pulling against the developing upper jaw, that we would create a situation in which we would be interferring with normal growth. The jaw just couldn't grow and expand properly against the tight pull of the scar tissue. So for these reasons, we just have to wait.

There are two main growth periods in the bones in the face in this area. Although it's growing continuously during childhood, it runs through a little burst, then quiets down. The two great growth periods are in these first years of infancy and then again in adolescence. If we waited until that first major growth period was pretty well completely over with, we would have to wait up until around school age. That is, if we waited until the tissues were strong enough, the best ideal conditions and so on. On the other hand this is not rule enough to be too practical either, although a few years ago there were quite a few people who advocated this 5 or 6 year-old period, and it became fairly widespread for a while. Results are just not as good in speech and other things as if we get that repaired earlier. Now, it was mentioned here earlier, at what age do these children start real enunciated speech, and usually everybody ducks the tissue. We don't know. You all know that the average child speaks at a year and a half, if you call that enunciated speech. It's probably going to be six months, maybe a year longer than that before the cleft palate child does. So we have a little longer to wait in the cleft palate than we do the normal child before they're going to do much enunciated speech. However, unless we get that palate closed before they have much enunciated speech, you people know better than anybody else that you have a much more difficult time overcoming the bad habits that they have spontaneously developed in their speech mechanisms. So we wish not only to have the cleft repaired before they do much enunciated speech, but before they get to the teachable age, towards school age level, at least, to have a couple of years to have this scar tissue to soften and limber up so that they have the best possible functions at the time they begin their general education and their speech therapy. All down the line we'd like to wait until school age for some things, but it still is impractical. So there has to be a compromise. Now everybody doesn't agree just where this compromise ought to come. We still argue a little bit but actually, I think now we can say that in over 90 percent of clinics all over the world, surgeons will handle these cleft palate repairs somewhere around the 1½ to 2-year level. Some going a little before that, some past, and in clefts that are extremely wide, waiting a little bit longer until more growth gets them a little closer together. I've seen these children at the cleft palate clinics, and presented at meetings all over, and the surgeons argue violently sometimes about these minor differences. I don't think it makes a great deal of difference. As long as it's not done too early in infancy, and as long as we don't wait until after school age. In the inbetween range, there is certainly the general area that is correct.

Now let's talk about the surgery of the palate. The closure of the soft palate, the muscular palate, posterior palate, however, you refer to it, is the same principle exactly as the closure of a cleft lip. We have to create 2 raw surfaces, by incision or excision of tissue along the margin. By some means or other we have to release the tension so that those 2 raw surfaces can be brought together, and in this case much more so than on the lip, without any tension, because here again we are fighting mouth infection all the time and any tension will not hold. Of the 2 general ways in which that tension is relieved, probably the commonest procedure is referred to as the Von Langenback type of operation in which lateral incisions are made inside the last molar teeth, the two raw surfaces are brought together leaving two open gaping wounds on the sides of the mouth. The other principle, which is the Brophy procedure, is one in which we depend not upon the relaxing incision to slide those two halves of the soft palate together, but which we depend upon the fact that the cleft palate is not only cleft, but also high vaulted. In a high arched palate, the tongue doesn't go into the proper articulation and can cause trouble once a while. We even see some where our dental people put in appliances to get that level down further. In the Brophy operation, we depend upon mostly the action of a candelabra bridge, where we have this high vaulted arch in the palate, just freeing the tissues from the nasal cavity by dissection so they can be brought down like the arms of a candelabra bridge. Actually, the two procedures are frequently combined, bringing them down in the Brophy procedure and then making a small relaxing incision in those wide cases which don't quite come together without tension. That is the basic principle of the closure of the soft palate. Now, when we come to the hard or bony palate, a different principle has to be involved. Inasmuch as the anterior part is a hard bony structure, it is perfectly possible to free that bony structure from the alveolus on either side, put drill holes through and put those two parts of the bony palate together at the middline and wire them together. The procedure which was developed by, and popularized by Dr. Davis about a generation ago, became popular for a while. Today there are a number of outstanding clinics that employ this, and it is a very fine procedure. But it isn't necessary to do as much bone removal as that, and again, only a few clinics employ it to a great extent. For the most part they use the tissues that cover the bone, the mucus membrane, periosteum which covers the bone, which are bound tightly together and usually called and referred to as mucoperiosteum, leaving the bone where it is, and there again it can be closed either by the lateral incisions to free it so it can be brought to the midline without tension or by the Brophy procedure which allows them to be brought down from the high vaulted arch as the arms of a candelabra bridge. Those are the two basic principles of closure.

Not too many years ago, 25 maybe, these children went through five or six operations, one right after the other; nothing held. You wound up with a bunch of hard, leathery scar that no speech therapist had half a chance with. The dental people hardly had a chance. Today, with the improvements in surgery, these horrible break-downs don't happen to us very often. But we do get occasional minor breakdowns, so that secondary surgery is very common in all cleft palate work, and there is no way to avoid a certain amount of that sort of thing. I wish we could say otherwise, and all the antibiotics in the world do not stop all this trouble. However, if we can get a primary basic closure without any major break-downs, particularly of the velum, which is the all important valve for speech, we come out with a pretty good palage, even in spite of secondary surgery, and these children do not go through 6, 8 or even 10 operations. They don't have this terrific hard mass of scar tissue in most cases, which is a handicap later on. Along with the cleft palate surgery today, either in conjunction with the cleft palate repair, or as subsequent procedures done separately at any age of life, there are these procedures which are used to try and improve the shape of the jaw and the speech. As far as the shape of the jaw is concerned, I mentioned the fact that when we collapse these alveolar ridges, they tend to collapse too far, and we need what I've always called for many, many years preventive orthodontia. In recent years this has become a very much talked about field, and a great many people doing many things for it. One of the earliest orthodontists in our service started putting appliances on some of these young children, trying to keep this from collapsing this way. This is very difficult. These teeth are shaped so that it's hard to hold wires on them. These children are not the easiest things to work with in the world, squirming all over, and scared to death of the dentist, and this is quite a problem. But it has been done with more cooperative children with a considerable degree of success. Some people were actually going into infants, newborns, taking impressions of the jaw, making a little appliance to fit over the jaw with a jack screw inbetween, so they could turn it and set the tension. Some of these had to be out-riggers, out to the head and cheeks, to hold them in place in these children. In recent years, every meeting I go to they are talking about these bone grafts, in which they are actually taking bone from some other part of the body and grafting into the cleft in the alveolus, in an attempt to have a permanent graft that will keep it from collapsing. I'm sure this type of thing is going to grow, although I'm not so sure of the surgical techniques yet. It seems a little radical to many of us, although it's being done more and more. Maybe I'll be proven wrong on this later on. But the more important thing is the fact that we're doing so many of these operations which are intended to try and help you, by giving the child a more normal mechanism of speech. There are the pharyngoplasty, which are part of the oldest thing which was ever done to help the situation. Dr. Brophy proposed this operation two generations ago, and it's been very common practice in certain clinics all this time. It's not used as much as it should be. They freshen the cleft, not only in the soft palate and the uvula, but carry it down part way along the posterior tonsilor pillar, and suture it together. It doesn't always hold, by any means; it does in varying degrees in a various percentage of cases, but if you do get any reasonable holding of these tonsilor pillars together, you create a thin web-like structure behind the uvula which makes your velopharyngeal opening considerably smaller. It helps the speech and if you do have to get into trouble taking the tonsils out, you've got something, definitely, that prevents the wrong direction for speech.

About 35 years ago, Dr. Wardhill, in England, developed another type of pharyngoplasty in which the posterior pharyngeal wall was incised, undermined, and brought together and puckered in different ways in such a way as to narrow it so that the semi-circular pharyngeal muscles that have the purse string action in the velopharyngeal closure had a narrower space to close laterally. This became quite standard in a lot of places all over the world for a while after he did this. I don't think it's done as much now as it was for a while. Those are two procedures that can be done.

It was mentioned before to try and raise the posterior pharyngeal wall, push it away from the vertebra in the area known as Passavant's cushion, and this was done with some things like bone and cartilage, and today it is now being revived by Dr. Blocksma with the attempt to use silastic. Frankly, I can't get too enthusiastic. The early results of all these papers we've heard have been fine, but they don't seem to stand up later. We've mentioned the push-back operation. Dr. Dorrance spent almost a lifetime developing this and was the first man who made a thorough study of the muscles in the pharynx and palate. He put this together and came up with the push-back operation where the palate was pushed back at first, but it didn't stay there. They retracted back again and by these various techniques that were described they found they did not lengthen their palate as they tought they would.
Dr. Dorrance, after he'd been retired many years, brought in as many of these children as he could find that had grown up to adulthood, analyzed the results in their speech, and he came to give his report at American College of Surgeons in Chicago. He got up and said, "my lifetime has been a waste, because this thing just doesn't work." It was a very pathetic thing, but he did the tremendous thing that started the field in which you people are all working in today, and he set up and developed the basic anatomy and physiology that's involved in the speech mechanism. The push-back operation is not entirely discarded today, there is one type of push-back that is combined with the palate repair and is done very commonly. Some of my associates here in Buffalo use this almost routinely in closing their cleft palates. It gives a little lengthening but not much, but it's a very fine operation.

Finally, we have the pharyngealflap, in which there is adhesion created between the posterior pharyngeal wall and the uvular area. It is unfortunate that we can't all agree on what we should do on these things and I don't know all the answers. The first people that described this, the first one that I heard, was Dr. Moran of Washington, who got up and gave a small series with brilliant speech results in those that lived, but he also had a high mortality. Other workers developed this thing further later on, and simplified the techniques, and the safety of it came along with improvements in anesthesia and such things. Then people started doing these on every child a certain age, most of the older children who'd had a bad speech result, or everyone the surgeons were not very happy about in pharyngeal closure. The results improved. There were two or three techniques for doing these flaps, one from the mid-line, one from above and down, one where they take two flaps from the sides and bring them in. Then it got down to where some people were doing them in younger children. Their speech didn't come along real quickly at school age. One man gave a paper a few years ago in which he did not advocate this as a clinically good idea. He ran it as an experimental procedure on selected cases. He did a pharyngeal-flap in conjunction with his original primary cleft palate repair. I don't think that one's ever going to go, but I've been wrong in these things before, so maybe it will.

The results on a lot of these were remarkable, and people began doing them more and more. About this time, we started doing them around Buffalo, although we are still doing them largely in the older children, where we've had problems getting speech results by other methods. Now some of our otolarnyngologists are beginning to worry that we're interfering with the function of the drainage of the posterior nose, etc. I think that's more worry than real, although I couldn't say for sure it couldn't happen. I've seen a couple cases where we got adhesions and things that were not good backed with pharyngealplastics as well as pharyngeal-flaps. But in clinics where they've been doing a large amount of this, the world over, they have certainly had no serious incidence of increased ear disease and so on. On the other hand, it does create some surgery which has a little risk to it. It's unpleasant to go through, and so many of them are trying with the bulbs and the prosthetic appliances. I don't know just which is the best one for which case and how much we're going to do, but all these things are being done in conjunction with, or subsequent to, the cleft palate surgeon, to try and help you people, to have this in a better anatomical physiological condition for speech. Probably we're doing some things in the past that were no good. The answers are not all in by any means yet.

The last part of the surgery that we have to take care of is the final definitive surgery, which comes along about the end of adolescence. We have this nasal deformity, the greatly flattened nostril. Then we have some defects in the lip, some of them are brought on by growth periods in some older people from way back when they weren't doing the surgery of the lip as well in those days as is done now. They all have practically the flattened ala, the cosmetic defect of the nasal tip. They have the deviated septum, the partition which starts at the bridge of the nose, goes back through to the throat, dividing the nose into two air passages all the way back, and instead of being straight in the midline as it should be, which it isn't quite in anybody, that septum is always crooked and twisted and off to one side. After their growth of bone and cartilage is fairly complete, when we're not going to do further damage to the growth, and we do have to wait until about age 16 unfortunately, then we can go in and do the surgery to improve the shape of the nose, to improve the shape of the lip, and there are secondary procedures done on lips. This type of work is done under local anesthesia. I do a lot of it right in my own office. I might also point out that although the surgery on the growing bone and cartilage of the nose cannot be done until after adolescence, there are a few people who start trying this again, because it looks so nice and so easy and for 2 or 3 years they don't have any trouble until these children grow and wind up with some damage later on. You've heard where people think they ought to at least open up the breathing passages with a septum resection at a later date. Any body that's been through a generation knows that this is a pretty dangerous thing to do, unless they learn something new on how to control growth. However, even though we cannot operate on cartilage and bone until after adolescence, we can operate on soft tissue, skin, and the subcutaneous tissues. Today along with our cleft lip repairs, we are doing a little more surgery to wrap that nostril into a better position on the face, then raise the columella, the space between the nostrils that occurs in the double cleft lip. We're doing more and more surgery at the time of the original palate repair, or in infancy, or in conjunction with other surgery in early childhood, to try and hold these cartilages in a little better position during this growth period, hoping that the deformity of the nasal tip will not be as great, and I think we are meeting with some degree of success in this, although it's pretty early to tell.

I want to spend a few minutes on a few general things. Except for the pediatrician, or the family doctor who takes care of the general health of the child, the surgeon is invariably the first one who comes into the care of these children, and the first couple of years of their lip and palate repairs we are the primary counselor and guiding light to these parents about this condition. Although we may take them to our cleft palate clinics, what can we do in most of these cases at that age, other than the actual surgery of getting the anatomical repair work done as best possible. So we get up to the clinic stage, and thank goodness we have clinics now. In my early days we did the palate repair and the lip repair and then I referred them to an orthodontist's office. Our speech department in the public schools consisted of two teachers who traveled around town. I'd send them to a nose and throat man if there was ear trouble, and send them to other people for various helps. I never heard a report on any of them. I didn't know what they did. There was never any consultation and I'm telling you our results were sometimes poor, and it was discouraging. You almost didn't want to see a cleft palate child come into your office. The main thing that has made this nice work to do is the fact that we now have these group consultations. We have them scattered all over the State of New York, Long Island to Buffalo, with reasonable traveling distance, in which I can sit down and talk this thing over with these people that I need help from, orthodontia, prostodontia. This has taken the responsibility, somewhat, off my shoulders, and we're getting better results, and that is the important thing. So, as I started to say, the surgeon becomes the chief counselor up to this point. Now, in spite of the fact that we transfer them over, and they come to the age where the speech clinician, the teacher, the dental people, and others become the important people where the active treatment of that child is concerned, we seem to be blessed with being the permanent family counselor about this particular problem not general health, all the way down the line. And we do have to carry a large percentage of that responsibility, and that is why we are so greatful for the things you people do to help us out, because that was the things that made this miserable work in the days past. We're now beginning to get much better results than we did.

Dental Management of Cleft Palate

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For a long time now, it has been known that people who are interested in the cleft palate problem must see the problem from the beginning, from the time of birth onward, in order to more fully understand it. Today, dentists in many areas of the world are obtaining controlled and reproducable records on infants with clefts of the lip and palate, as soon after birth as possible. These records consist of plaster cast reproductions made from impressions of the face and jaw, as well as photographs and oriented X-rays of the structures of the head and neck. Much information has already accrued from these records. People who are interested in cleft palate soon came to realize that the morphology of cleft palate can differ dramatically from one individual to another. Variation was found to be the rule rather than the exception. One learned in accordance with an old age expression, "Never judge a book by its cover." In some instances, cleft of the lip was observed to exist without a corresponding cleft of the palate. In other instances cleft palates were observed to exist with or without a corresponding cleft of the lip. We have to realize that variation is our problem in this situation. In order to obtain some degree of uniformity for purposes of description, many attempts have been made to classify congenital clefts of the lip and palate. To mention but one out of many, Pruzansky has categorized the varieties of clefts into four general catagories. One is the cleft involving the lip alone and usually a bit of the alveolar process; those involving the palate as well as the lip or the unilateral-bilateral clefts; those which involve the palate alone, which can range anywhere from slight clefts of the uvula to more extensive clefts; and, finally, congenital insufficiency or sub-mucous cleft, which is the cleft which is frequently not seen, but many times heard. It must be emphasized that within each of these categories further individual variation could be noted.

The category of cleft lip seems self-explanatory and would appear to describe a soft tissue defect. However, the variations of clefts of the lip are numerous. They can range from a notch in the vermillion border to a complete cleft extending to the floor of the nose. When we say cleft lip, we are still not talking about the same thing; we still have to define it, and to classify it, and describe it, because the variations are tremendous. Cleft classification, and variations within cleft categories were introduced to emphasize the need of evaluating morphologic and physiologic relationships in each individual with a cleft of the lip and palate. Many factors must be evaluated as one examines infants with clefts of the palate. Differences in the width of the cleft may be noted. Within the category of unilateral cleft lip and palate there are other factors which we must examine, and one of them is the width of the cleft. There are also concomtitant differences in relationships of the parts that border the cleft. The question of whether there is basic deficiency of tissue or a marked displacement of tissue in cleft palate individuals has frequently been discussed.

Records have not been routinely taken by dentists to diagnose these factors in individual cases, but these very same records have made it possible to conduct studies and provide some general information in these areas of inquiry. In other words, are we dealing with this cleft, are we dealing with something that's missing, or are we simply dealing with something that is pushed apart? Is this cleft a void or open cleft because the parts of the jaw are pushed laterally, or is this a cleft because there are parts missing? We can't answer this question directly, but by the same token there have been some studies which have been conducted which can give us some information where this is concerned. An example of one study, cephalometric laminography, which is a body sectioning X-ray technique, was used to study 127 cleft palate children in an attempt to determine whether there is a deficiency of tissue, or a displacement of tissue, or both, in cleft palate children. We utilized a technique which permitted us to see just a certain layer of the head or a certain part of the head. The dimensions of the hard palate were measured to determine the amount of tissue present, and compared with similar measurements in non-cleft children. The dimensions of the hard palate area were measured to determine just how much tissue was present, in the cleft palate children, on an average. These same type of X-rays were obtained on non-cleft or normal children under three years of age, and their palatal shelves were measured to determine how much tissue they had. If we compare one with the other, we can ascertain whether there is deficiency in cleft palate children or whether there is not. We also wanted to see whether there was displacement in these children, or displacement of parts of the jaws, or whether there was no displacement. So the distances between the lateral walls of the nasal cavity were measured. We took a linear measure, but we measured the most lateral aspect of the nasal cavities, presuming that if the nasal cavity was wider, and the jaw were further apart, there was displacement, and if they weren't there wasn't. Deficiency of hard palate tissue was found to exist in all types of clefts involving the hard palate. The bi-lateral clefts were found to exhibit the greatest amount of tissue deficiency, whereas the unilateral clefts exhibited the least amount of palatal tissue deficiency. These observations were true on an average basis, and it must be emphasized that some of the individual cases did not show any actual deficiency in palatal tissue at all. This serves to emphasize the need of evaluating each case on an individual basis. It cannot be categorically stated that deficiency of tissue is the rule in each case. However, likewise it can be stated that one of the basic differences between some cleft palate children and non-cleft palate children could be found in the amount of hard palate tissue that is present. A difference in the special position or the displacement of the hard tissue was also noted. Once again, in this study, the greatest displacement was found in the bilateral clefts. Thus, the displacement of tissue as well as deficiency of tissue, can and does exist in cleft palate subjects. Although this is not true in all cases, individual variation again should be noted. Again, this observation serves to accentuate the necessity of a very careful evaluation of each individual child to determine which, if any, conditions prevail. These records and studies developed with them serve to demonstrate the great variation encountered in the cleft palate problem, but their value far exceeds the demonstration of variation. They form a basis for observing and evaluating changes occuring with the time and growth, as well as those incidental therapeutic procedures. They are not only valuable for diagnostic purposes, but form a permanent record from which continued observations and evaluation can be made. For example, with continued increment in age, and as progressive records were obtained, it became obvious that in some cases in the cleft of the lip and palate, the cleft palate became narrower as the child grew older. Aside from growth itself what factors are associated with the narrowing of the cleft? In some instances the surgical correction of the lip has undoubtedly been instrumental in accounting for some of the change. Surgical correction of the cleft lip frequently changes the relationship of the alveolar segments evident at birth. Upon healing, the reconstructed lip creates pressures on the alveolar segments, and usually initiates a molding action. In some cases, the molding action can bring about an approximation of the alveolar segment anteriorly. However, this approximation of the anterior alveolar process is not always as nice in all cases. One alveolar segment may fall within the other. But this narrowing movement in the anterior regions of the mouth frequently results--and this is important--in the concomitant narrowing of the palatal cleft. These sequences of events may also lead to a constricted maxillary arch in a child with a cleft of the lip and palate. As a result of lip surgery alone, the alveolar process of the smaller maxillary segment may have been moved by muscular forces into a lingual relationship with the corresponding aspect of the lower jaw. The molding of the lip many have squeezed the two parts of the jaw too tight together, and as a consequence there may be a narrow maxillary jaw, so that when the permanent teeth erupt they may be in what we call a cross bit relationship, which may be a malocclusion type of relationship. The molding action of the lip is not restricted to the alveolar bone alone, but may cause a rearrangement involving each part of the maxillary jaw bordering the cleft. In other words, it's not just the bone that's been moved, it's the whole maxillary jaw that's been moved, and, this has been substantiated via the cephalometric laminagraphs or the body section X-rays which were obtained on these individuals. If one of the maxillary segments is over-rotated medially, the displacement may result in a fairly typical orthodonic problem in these children, a constricted or narrowing maxillary arch. This frequently results in a cross bite malocclusion in one or both of the buccal segments which are the posterior segments of the dental arch. Until recent years, the orthodontic correction in these cases was undertaken until after the eruption of all the deciduous teeth or baby teeth at approximately three years of age, or later. This aspect of dental management will be discussed shortly. In recent years, clinicians in some areas of this country have come to believe that orthodontic correction should start shortly after birth. Some of these people feel that a constriction of the maxillary jaw cannot be avoided after lip surgery. It is felt that the parts bordering the cleft are easily moved shortly after birth. Technically, what they do is take an impression of the newborn's upper jaw, and a plaster model is poured. The model is sectioned and the different parts are repositioned to what the orthodontist judges to be a more correct relationship, and then a simple acrylic plastic appliance is constructed to this more correct relationship and the appliance is worn by the neonate, or the child is forced to wear this appliance, which supposedly moves the divided parts into more correct relationships. This procedure may be repeated several times before the orthopedic correction is completed, and takes from 2 to 6 months. It is at this time that the cleft lip is surgically repaired. At the time of lip repair, bone is usually grafted into the alveolar region. The bone graft is placed to help maintain the orthopedic correction of the maxillary jaw, to fill the defect due to bony deficiency in the alveolar region, and to eliminate the necessity of a retention appliance to maintain the orthopedic correction.

To reemphasize this, the people who do this feel that if they put in a bone graft they will maintain the parts of the maxillary jaw after they have been positioned orthodontically. This is before any of the teeth erupt, and they replace the deficiency of tissue with bone graft. Once this is done, they feel that the child will not have to wear a retentional appliance after orthodontic treatment. The teeth will erupt into perfect relationship and there won't be the necessity of an appliance to maintain this relationship. The bony implant, in other words, accomplishes a bony stabilization of the parts of the maxillary jaw in the cleft lip and palate infant.

It should not be assumed that all orthodontists consider this to be an advisable procedure to be routinely accepted and followed. There are several potential disadvantages to be considered. Presurgical orthopedics, of course, postpones the surgical correction of the cleft lip, which can create obvious socio-economic problems, and this does not require further elaboration here. Then again, the implant of bone is frequently based on the assumption that tissue deficiency is the rule in children with cleft lips and palates. As previously mentioned, variation is the rule on the basis of well documented studies. It cannot be categorically assumed that all individuals with cleft lip and palate exhibit deficiency of tissue. Some individual cases, upon measurement, do not show any deficiency at all. In fact, many of these cases have been found to exhibit an actual displacement of the divided parts, and this could easily present the most important consideration in this procedure.

It has been noted that surgical correction of a cleft lip usually initiates a molding action. It is important to emphasize that this molding action may create a constricted maxillary arch but, in so doing, there is frequently a concomitant narrowing of the palatal cleft. This can have important implications when future palatal surgery is indicated. The cleft in a soft palate area can be reduced in width, as well as the cleft in the hard palate area. The narrower the clefts, the smaller the dimension over which the soft palate tissue must be manipulated. It would seem that the narrower the void the better the potential would be for a longer soft palate, and, possibly, a more functional soft palate.

As has been previously mentioned, the surgically reconstructed lip exerts pressure on the bony segments of the maxilla and initiates a molding action. I would like to point out once again, the ring of musculature which surrounds the maxillary jaw. We have our cheeks and we have our lips. One muscle surrounds our upper and lower jaws. We must remember that this muscle is also attached to other muscles. In fact, you have a complete ring around the maxillary jaw going from the area of the cervical column, or extending from the precervical area all the way around to the front of our mouths or lips. In a cleft palate and lip this muscle is cleft. Sometimes the surgeon will correct one side of a bilateral cleft of the lip and there may be a deviation of the free maxillary element towards that side. Now, he may correct the other side and there may be a deviation back of this pre-maxillary segment toward the midline. What we are saying is that this musculature once again is acting like a rubber band on these cleft parts and, as a consequence, it is moving these parts subsequent to the lip surgery. But the proof of the pudding is always in the eating. Does this actually happen? Does this musculature actually have this kind of influence? Yes, the musculature can, and does mold these parts of the upper jaw. And, of course, there is a change in the dimension of the palatal cleft. Pressures on the segments create a narrow or constricted maxillary alveolar arch. As we pointed out before, the constricted alveolar arch usually results in a cross bite malocclusion in one or both of the buccal or posterior segments of the dental arches.

It is important to realize that the type or extent of the cleft evident at birth can predetermine whether or not a constricted maxillary arch will occur. This will not happen in every individual with a cleft of the palate. For example, a cross bite malocclusion is frequently not observed in cases of posterior clefts of the palate where the lip and alveolar processes are not involved at all. We cannot anticipate a cross bite relationship or malocclusion in a case where a part of the hard palate and the soft palate is cleft, and where the alveolar processes and lip is intact. Where you did have a complete cleft, you can have the constriction of the maxillary arch. Once again, it is important to know the type of cleft before we decide that there is or is not a malocclusion, or will be a malocclusion. A knowledge of the evaluation of the constricted maxillary arch via this lip pressure indicates that the initial phase of orthodontic correction in cleft lip and palate cases should be directed towards counteracting the adverse muscle forces. We work in the opposite direction. When we do apply our orthodontic forces in complete unilateral and bilateral clefts, in many of the cases we not only move teeth, but we actually move the jaws, or parts of the jaws, to more correct relationships.

By reconstructing the oral architecture and placing the segments in their proper location, the orthodontist can provide the potential for more normal growth and development. If the constriction has resulted in containment of one alveolar segment within another, the alveolar processes may not be able to develop fully and optimally, since one alveolar segment is buttriced against the other. In other words, if in this constricted condition the pre-maxilla overlaps this smaller jaw segment rather tightly, there is no room for the alveolar bone to grow and the teeth, when they erupt, will erupt in bizarre positions and not erupt into a correct relationship because there is no room, not only for the teeth to erupt, but with it for the alveolar bone to grow. So, we feel that if we move these apart, and move them apart properly, we open up the room for the alveolar bone itself to grow. It is important , therefore, that these segments be unlocked during the early stages of development when growth is most rapid. Advantages may then be taken of the greatest possible growth potential from as early an age as possible. If orthodontics is done at an early age, the maxillary architecture may be closer to the normal than at a time when basic speech habits are being rapidly established. This may be of considerable value in speech learning since it may reduce or minimize the development of the common misarticulations of a cleft palate child frequently evident at a later age. It can be assumed that the earlier the oral mechanism has achieved its potential for normalcy, the sooner the general tongue activity may more closely approximate normal function during speech. Compensatory adjustments of the tongue dictated by narrow abnormal oral configurations may be avoided.

At this point it may be wise to emphasize that other members of the dental specialties play very important roles. Orthodontic correction and the repositioning of the displaced parts of the maxillary jaw are dependent upon the presence of the deciduous teeth. These teeth serve for the support of the orthodontic appliances. Therefore, dental care of the deciduous teeth is imparative at this age as well as at later ages. Loss of maxillary teeth through caries may delay orthodontic treatment or lead to a less favorable prognosis. In these children, teeth are frequently malocculused, and not in position for ready and easy cleansing. Therefore, an early and regimented program of dental care if often a prerequisite for a successful therapy. This is not limited simply to routine dental care of deciduous teeth, but measures to improve oral hygiene, to improve dietary habits, to flouridate teeth, etc., should be initiated in a comprehensive dental care program. The dentition must be in good health, not solely to permit the application of orthodontic forces, but to permit the placement and prolonged use of a retention appliance and, if need be, a dental speech aid. Once the maxillary segments have been adjusted into position, retention is necessary to re-maintain them in the desired position. This is especially true since it is virtually impossible to stabilize the adverse muscle influences of the lips. Failure to retain the expansion will permit a rapid return of the bony segments to the initial constricted configuration.

Actually, in many of these youngsters, when we have expanded them via our orthodontic appliances, we put in our retention appliance the same day within a period of a few hours, if we can. If we leave it over night, we can find a collapse almost to the original condition, and many times we have to start over again. These retention appliances are rapidly constructed and inserted, and in addition serve other useful purposes as well. If openings remain in the hard palate region, the retention appliances can adequately cover and obturate these openings.

In these instances where surgical correction of the palate is contraindicated, it may be necessary for the prosthodontist to design and construct a prosthetic speech aid. The speech aid has a hard palate region, or the part that would cover the roof of the mouth, and has clasps or wires laterally, which attach to the teeth. We usually put bands on the teeth to maintain this appliance in place, and then the pharyngeal section, which is this bulb, on the lower area which does into the more posterior region. These prosthetic appliances serve to obturate any opening of the palate and usually carry an extension into the pharynges. This section is designed to provide adequate velo-pharyngeal valving for speech purposes. The pharyngeal extension must be carefully molded by the prosthodontist to the individual needs of the child. It is individually constructed so that there is close approximation of the functioning velo-pharyngeal musculature around the pharyngeal section, or extension, during the speech and deglutition. In other words, it conforms to the dimension, shape, and position of the velo-pharyngeal opening that exists during the functions of speech and deglutition. For stability of the dental speech aid the prosthodontist must clasp the deciduous teeth. Without these teeth for anchorage purposes, the stability of the speech aid may be lost, and the prosthesis may be grossly inadequate. It should be pointed out that most cases requiring these speech aids are greatly benefited by orthodontic repositioning of the maxillary segments before the insertion of the prosthesis. A more normal architecture is provided for the prosthetic speech aid. In addition, it helps to insure that the palatal covering can be as thin as possible. Lingually positioned teeth and thick palatal sections can reduce the volume of the oral cavity, and reduce the permissable range of the movement of the tongue, which could be detrimental to speech production. In certain instances, necessary orthodontic movement can be accomplished in conjunction with the placement of the speech aid. Unfortunately, this can limit and delay the desired movement. When we have a narrow constricted arch and have a thick palatal section because teeth are in the lingual position, we can really minimize or reduce the amount of capacity of the oral cavity itself. By initiating orthodontic treatment at an early age and establishing an acceptable occlusion of the deciduous or baby tooth dentition, it is feasible to assume that the permanent teeth will erupt in a more favorable position. The permanent enterior teeth, especially those closely bordering the cleft in the region of the alveolar prothesis, will usually erupt in a mal-position, and frequently in a severely rotated and poorly inclinced relationship. Even if we do orthodontics at an early age to reposition the parts of the maxillary jaw, it's been our experience that at a later age, when the permanent teeth start to erupt, they usually erupt in a malposition severely rotated or twisted. In order to extend as many assets as possible to the speech development of cleft palate children, including those related to tongue tipped contact, it is considered advisable to undertake the correction of such malalignments shortly after the eruption of these teeth. We almost consistantly see this in teeth adjacent to the cleft. Chronologically, this may be approximately seven years of age or older. This can, and is, readily accomplished by the orthodontist. However, it should be pointed out that from this age onward to adulthood, certain dental specialists play a major role in a diagnostic capacity, as well as a vital role in maintaining the health of the teeth. In aligning the teeth and in replacing missing teeth and anatomic structure, orthodontists for a great many years have been using head X-rays to study the growth of the head and the eruption of teeth.

Cephalometric head plates, which orthodontists and other members of the dental profession will very frequently take, are made by means of strict positioning of the head within a head holder, the taking of a head plate, and then subsequently repositioning the patient in the head holder and taking it again. Because of the availability of this radiographic technique, orthodontists can be of tremendous aid in diagnosing velopharyngeal function and in evaluating continuing changes incident to age growth and therapy. Radiography has been utilized to visualize tongue and soft palate movements in the midsaggital plane of the head. Changes in the configuration of the tongue mass, the relative position of the tongue within the oral cavity, and the location of the velopharyngeal or soft palate closure can be visualized during the production of certain speech sounds. We can visualize these things on a cephalometric head palate and this can be important. Radiograph studies of the velopharyngeal mechanism have revealed that during normal speech production, the soft palate moves in an upward and backward direction to approximate the superior or the posterior wall of the pharynx. At the same time, by clinical examination, it has been determined that during velopharyngeal closure, the lateral wall of the nasal pharynx moves towards the midline to create a velopharyngeal closure with the elevated soft palate. This is a dimension that we can't see on the cephalometric head plate, but we can see it clinically. This mechanism serves to functionally block off the nasal passage during the production of intelligible non-nasal speech. A cephalometric radiograph may be taken for its diagnostic value in evaluating velopharyngeal adequacy at any time in a child's life. An X-ray may be taken on a cleft palate individual during sustained sound production. From this X-ray it can be determined whether the soft palate does or does not contact pharyngeal tissue during phonation. On the basis of many X-ray studies, it has been determined that nasality in speech is frequently correlated with the failure of the soft palate to contact pharyngeal structures during phonation. If velopharyngeal closure is not attained, such important facts as the degree of movement of the soft palate, the extent and dimension of velopharyngeal opening, and the posterior relationship of the soft palate to its contiguous structures during function can be most helpful in planning future therapy. For example, from such information it may be decided whether intensive speech therapy or further surgical or dental measures should be instituted. These same cephalometric radiographs can be used to determine the presence or absence of adenoid tissue in the nasal pharyngeal area. Its physical location and its role in alveolar pharyngeal function could likewise be accurately evaluated. The interest of diagnosticians in the cleft palate area has recently been enlarged and focused to extend beyond the dynamics of tongue and soft palate function. Attention is directed towards a better understanding of the surrounding frame work and contiguous structures. Because of the close proximity of adenoid tissue to the soft palate, the significance of this tissue to velopharyngeal function has been studied. The physiology of the velopharyngeal mechanism in the same individuals was examined by radiographic means both prior and subsequent to an adenoidectomy in an effort to determine what changes, if any, occur in the movements of the soft palate after the removal of adenoid tissue. Prior to surgical removal of the adenoid tissue, velopharyngeal closure occured against this tissue. Before adenoidectomy, the soft palate moved in an upward and backward direction, and contacted adenoid tissue. Subsequent to the removal of the adenoid tissue, it became necessary for the soft palate to move a greater distance to achieve a functional closure. Removal of the lymphatic mass increased the dimension from the superior surface of the resting soft palate to both the superior and posterior walls of the nasal pharynx. This necessitates greater muscular activity on the part of the soft palate to approximate nasal pharyngeal tissue and is dependent on the presence of adequate muscular potentional to overcome the increased distance. In the practical application of this work it became obvious that adenoid tissue should not be routinely removed in many cleft palate children. A soft palate, though limited in movement, may still be able to achieve an adequate velopharyngeal closure if it can contact an adenoid mass in a nasal pharyngeal area. This observation has confirmed the impression of many clinicians, who observed a definite nasality in some children with a repaired cleft palate, after an adenoidectomy. From this you can see why, in cleft palate children, if at all possible, adenoid tissue should not be removed. The soft palate has to move a much greater distance in order to achieve a closure.

The periodic accumulation of oriented head X-rays and the evaluation of these cephalometric radiographs facilitates an understanding of differences which may result directly from growth changes. A single cephalometric radiograph can extend much information concerning the past growth of the jaws and other structures of the head. In comparison with data accumulated on the growth of normal children over a period of many years, it permits an evaluation of how well the structure of the head of a cleft palate individual have grown to that date. One can determine whether the growth to date has been adequate or inadequate, and one can speculate on the potential of developing an acceptable facial appearance. When cephalometric X-rays have been accumulated on the same individual over a period of years, much of the speculation can be eliminated, and a much more educated estimate of potentional growth and ultimate facial appearance can be made. Once again, this can be extremely helpful in therapeutic planning. To exemplify this, one can readily sight some of the changing concepts related to the growth potential of cleft palate individuals. At one time it had been concluded that a cleft palate child, operated on at any early age, would frequently exhibit a deformity of increasing severity with progressive growth. It was felt that the middle face would fall farther and farther behind the development of the lower jaw and the forehead, leading to a disfigured facial profile. In many areas of the world, or the country, it was felt the surgical correction of a cleft palate should be delayed until the child approached school age. In other words, it was felt that any surgery on the palate would result in a type of facial configuration, with the upper jaw behind the lower jaw and, as a consequence, for a while in this country, and not too long ago by the way, surgery was frequently postponed on the hard palate and soft palate until the child approached school age. By delaying the surgery, it was assumed that the effect of the palatal operation on the growth of the maxilla would be minimized, thereby the least possible retardation of upper facial growth would ensue, and a potential for a good facial appearance would be enhanced. This viewpoint seemed to assume that all surgical corrections of a cleft palate would have a retarding influence on the growth of the upper jaw. In more recent years, and on the basis of continuously accumulated records, it has been pointed out that there are numerous cases of cleft palate which have been successfully corrected by surgery, and in which deletirious effects of facial growth are not visible. These differences in post surgical results cannot be ascribed to differences in surgical skills since all surgeons seem to have experienced varying degree of success. They indicate the presence of significant pre-operative difference among cases. Certain differences have been recognized for a long time but until recent years there seems to have been a sparcity of interest in the careful specification of the pre-operative differences which could be recorded and studied over a period of many years. A better understanding of the biological variations in individual cases and more adequate records of such variations now makes it more possible to predict the therapeutic results. Much of the deformity observed in the older cleft palate patients may have been the result of traumatic or poorly timed or executed surgery, or perhaps certain cases where palatal surgery itself should not have been attempted at all. Recent information adds much credence to this supposition. To remain in keeping with this paper, it is again pointed out that dentists have been helpful in presenting the principles of growth and development of the jaws, and in helping to apply them to the cleft palate problem.

Before continuing on to the adult stages of development, growth influences in aother area should be briefly mentioned because of their importance to speech people. For speech purposes, it is important to understand the growth changes in the region of the pharynx,especially that of the nasopharynx. It is in this area that the soft palate must function during speech. If the muscular soft palate may be loosely compared to a door, it is important to know how the door will change with growth, and where the frame from that door will be located with progressive increment of age. Continual change between the soft palate and contiguous structures undoubtedly has an influence on velopharyngeal function. By superimposing tracings of one cephalometric X-ray upon another, one can evaluate the growth pattern of many areas of the head and neck. The superimposed tracings of the head X-rays will reveal cranial or skull outlines that in many ways appear similar to the rings of the trunk of a tree that are formed by each year's additional growth. However, the growth of the human head is far more complex than the simple addition of uniform layers around a full circumference of a tree trunk. Different parts of the human head grow at different rates and at different times. As the maxillary jaw grows, it has been shown that the hard palate moves in a parallel manner further and further away from the base of the skull. This will normally continue until appromimately seventeen years of age. Both nasal cavity and nasal pharyngeal height and depth will increase as a result of this descent of the hard palate. The increase in the height and depth is understandable, since the floor of the nasal pharynx, the soft palate, by virtue of its attachment to the posterior border of the hard palate is being spatially carried to lower levels in relation to the base of the skull and the posterior pharyngeal wall. With the drop in the hard palate, the soft palate is carried to lower levels, and this increases the dimension between the soft palate in the superior aspect of the nasal pharynx and the posterior wall of the pharynx. It is also important to remember that adenoid tissue is physically located at the roof of the nasal pharynx, directly underlining the base of the skull in the pharyngeal area. The nasal pharyngeal adenoid tissue has also been shown to follow a specific growth cycle or cycle growth. It will reverse its cycle of growth or start to decrease in mass at between 10 years and 14 years, so that by the time you reach early adulthood or late adolescence you may have no adenoid tissue whatsoever. So, what's happening here, is that the nasal pharynx is growing larger in the vertical and anterior-posterior dimension, while adenoid tissue, which is effective in velopharyngeal closure after a certain age, is decreasing. This can have repercussions. Of course, the soft palate is also growing within this changing environment. However, in some instances the growth of the soft palate may not be adequate to compensate for the increasing dimension or distance between the attachment of the soft palate and both the superior and posterior pharyngeal walls. Thus, what might be an adequate speech mechanism for non-nasal speech at an early age may not be an adequate speech mechanism at a later age.

Close observations of individuals with clefts must be maintained until after all of the permanent teeth have erupted. This would include all of the ages under the category of adulthood. By late adolescence, final orthodontic positioning of all of the permanent teeth should have been accomplished. Whereas, at an early age this positioning involved boney or jaw segment movement, at a later age this usually involves individual tooth movements as well as some positioning of the jaws. During these late stages some form of permanent retention must be placed by a prosthodentist to maintain the orthodontic results and usually to replace missing dental units in the area of the cleft.

Despite the fact that we are approaching the later stages of growth there are still problems in the cleft palate child, or problems that we have to deal with in the cleft palate child which once again are related to growth, because the lower jaw will grow to a later extent then the maxillary jaw will. This can lead to facial configuration problems. In the noncleft individual, we can have a concavity to the face, and in cleft individuals or people who have surgically repaired clefts we can have the concavity to the face, and if it gets to the stage where the maxillary jaw has not grown as much as we would like to have seen it grow, and where the mandibular jaw is growing more than we would like to see it grow, then once again we may have to do something about improving facial appearance. What I'm trying to point out is that though some of this may be a normal growth pattern, this individual may have the pattern for a large lower jaw or comparatively large lower jaw as some of our noncleft individuals have, but superimposed on this is the cleft lip, and then this gives it a much greater impression of the deformity of the maxillary jaw, and once again nowwe may have to call the prosthodontist in to help us in this regard because they may have to place a maxillary appliance to help this. Sometimes these situations improve as the individual gets older. Sometimes there is a depression in the region of the nose or the region of the lip immediately underlining the nostril on the side of the cleft. It is at this time that I, personally, would approve of a bone graft. It is after a good proportion of our growth has occured in the cleft palate individual. Once this has happened, then it may be time to place a bone graft in order to give some support to the floor of the nose, because in the region of the cleft there frequently is a depression of the repaired tissue, there frequently is some distortion to the nasal ala, and here at this time, if a bone graft is placed, you can get added support to the lip and much better configuration to the nasal cavity. Sometimes in adults with a repaired cleft of the palate, velopharyngeal inadequacies may exist. That is to say, there may be a failure of the soft palate to contact the pharyngeal walls during speech, and to separate the oral cavity from the nasal cavity, which results in excessive nasal resonance. Many times a decision must be made relative to initiating additional surgical or prosthetic procedures for improvement of the velopharyngeal mechanism. If further surgical procedures do not seem too desirable, the prosthodontist may then be called upon to construct a speech aid. A good speech aid can only be constructed after a careful diagnosis, strengthened with the knowledge of the correct position of the individual parts for proper functioning. The correct positioning of the pharyngeal section is critical to the construction of the successful prosthesis.

I'd like to point out that prosthodontists very frequently not only construct the speech aid, but very frequently have been instrumental in determining where the speech aid should be placed, and this, once again, has been done on the basis of several studies, and there are some good guideposts to go by. In the first place, the prosthodontist has determined that the pharyngeal section should be brought up approximately to the level of the hard palate, because it has been ascertained that the mid point of velopharyngeal closure in non-cleft individuals is usually closely related to the level of the hard palate. This is logical. The soft palate is attached to the hard palate. The soft palate moves upward and backward, and it is usually about the level of the hard palate that we get our greatest point of approximation between the soft palate and the pharynx. So the prosthodontist, via studies, has substantiated this impression and will construct the pharyngeal section so that it is at the level of the hard palate. The prosthodontist has also ascertained that to have a successful speech appliance, not only must the pharyngeal section touch the pharyngeal tissue when it moves, and not only must this be at approximately at the level of the hard palate, but it also must be at that area, or in that region where the lateral walls of the nasal pharynx can move medially to contact it, because velopharyngeal closure is not just a midline closure, there are lateral aspects to it and if we do not take this into consideration, there may be inadequacies in the lateral dimension of the pharyngeal section, and as a consequence, even after the placement of the speech aid, you may still have nasality in speech. It is not only important to have it at the right level, but also to see that the lateral walls of the pharyngeal cavity during function move medially, to touch and contact the pharyngeal section of the speech aid.

In conclusion, it can be stated that dental care of the individual with a cleft lip and palate begins at birth and continues into adulthood. Actually it continues throughout the lifetime of the individual. Reconstructing the oral cavity and maintaining the health and integrity of the oral cavity are important to speech and facial appearance. The dentist is capable of playing a vital role in the habilitation and rehabilitation of the cleft palate individual through his knowledge of anatomy and physiology of the oral cavity, supplemented with the knowledge of growth changes and what they mean to cosmetic and velopharyngeal function, and, of course, I'd also add here, his ability to use his armamentum for diagnostic purposes where any individual is concerned.

The Diagnosis of Cleft Palate Speech

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The text of my message this morning is drawn from Archie and Maehitable by Don Marquis. He wrote a poem entitled "The Robin and the Worm." At the end of it is a reference to a scene from Hamlet where the gravedigger is present, and the skull of Yorick. A worm crawls over the spade of the grave-digger, and winks at Horatio, and says, "there's more twix Nirvana and the vemiform appendix than thou dreamest of in thy philosophy Horatio. Fal-a-de-riddle, Fal-a-de-rol must every parrot be a pol." With thos profound words, I want to start on the subject of cleft palate. As you know, there is far more to the speech problem of the cleft palate child than is caused by existence of a cleft palate. And it's in the hope of drawing our focus a bit off the cleft palate issue that I want to take a more generalized approach this morning. Cleft palate, we conceive to be a multifaceted defect with multifaceted consequences in a multifaceted individual. It affects the physical growth and development of the person. It affects his social life, that of his family, the community in which he lives. It affects his personality, and particularly his self-concept. Cleft lip and palate and their effects on speech are in turn affected by the physical care, the social life, and the personality of the individual.

One of the things that I hope we don't ever forget is that the cleft lip and palate condition are lifelong afflictions. The significance in the life of the individual continues throughout his entire existence and therefore, the steps we take in the management, examination, the treatment of cleft palate should be taken in view of long term goals, rather than short term ones.

The other main point I would like to make, by way of introduction, is to suggest another term than "team" management of the cleft palate problem. I want to call it "programmatic" treatment, because programming suggests that there are successive steps in the whole management, and that not only is this an interdisciplinary activity, involving all the specialists, (and we would of course include the parents in this case as specialists) but, it implies also that these things are timed according to the stage of development of the child. It implies that the interventions are accomplished in an appropriate way, according to the age, and capabilities, and growth of the youngster.

When we're talking about the way in which cleft lip and palate affect speech, I think that we need to remind ourselves that it does this by <u>direct</u> and <u>indirect</u> means. By direct means, I wish to indicate certain mechanical interferences which the anatomical defect imposes upon this function we know as speech. It affects speech indirectly by interfering with articulation because of some other malfunction introduced. For instance, hearing loss may be precipitated because of the relationship between the defective palato-pharyngeal valve and the eustashian tubes. The orientation of the eustashian tube in the small child as distinguished from the adult, and the susceptibility of the cleft palate child to upper respiratory infection and middle ear disease. These factors lead to conductive hearing loss. The things that seem to affect cleft lip and palate speech directly, do so through lip deformity and lip malfunction, mal-occlusions of the teeth and dental arches, the defective structure of the palato-pharyngeal valve, and nasal defects, occasioned by blockage of nasal passages associated with the cleft condition. These things that I have just reviewed, the lip deformity, the mal-occlusion, the defective structure of the pharyngeal valve, and the nasal stenosis, or constriction of the nasal passages may affect articulation directly. The direct affect on voice quality is, of course, mediated through the palato-pharyngeal valve deficiency, resulting in hyper-nasality. This we're all aware of. What we sometimes lose sight of is that nasal deformity may result in hypo-nasality, as well. Many children that we hear, present a voice quality that is a mixture of hyper and hypo-nasality.

The ways in which cleft lip and palate indirectly mediate their effects upon speech are all known to you. They affect the general health of the patient. The cleft palate child is susceptible to upper-respiratory infection, and hence susceptible to pneumonia. Often times these children go through periods of malnutrition. Such things eventually have their effect upon speech. Secondly, they affect speech indirectly through the selfconcepts that the individual develops. Sometimes, I think our children and adults are far more handicapped by the way in which they conceive of themselves, and their relationship to the world, than they are handicapped by their anatomical defects. These indirect effects are mediated, also, through the factor of social acceptability. You know, there are people that sometimes find it difficult to accept the child with cleft lip or palate. The factor of hearing acuity, I have already alluded to. Many of these children, also, because of the cleft, develop abnormal oral motor habits. And then, of course, the phonatory habits of the patient may also be affected by the cleft condition as well as the resonatory aspects of voice. Many of these children are known to have hoarseness and other voice problems.

Just to emphasize this point, I would like to run through some figures we've collected in reference to 29 children who have been in residence during the summers at our clinic for the past 4 years. Some of these children have been there more than one year. We usually take 10 children at a time, and these are accepted for intensive speech therapy, as well as for extended examination and diagnosis. There were 16 males and 13 females, ranging in age from 8 to 13 years of age. I'll sight just a few of the things in the history that may be of interest to you. Eleven of them had a history of bed-wetting. Six of them a history of convulsions. Sixteen of them a history of ear-aches, and 11 running ears, and when we get to the examination of them, you'll find that 16 of them had defective hearing. Only 13 of the group were said to have normal hearing. Remember, I'm not trying to present these as the characteristics of the total population of cleft palate. I'm only indicating that these were a selected group, and of this group, they had these kinds of problems. Four of them had congenital heart disease, and another four had heart murmer. Nineteen of them had had chicken-pox and 24 of them had had measles. Eight of them had had pnemonia, and one of them had had pnemonia eight times. T and A had been performed on 10 of them.

From the examination data, the dentists that examined them recorded that 12 had poor oral hygiene, 13 had fair oral hygiene, and only 3, (that's only 10 percent) had good oral hygiene. I've already indicated that 16 of the 29 had defective hearing. The hearing defect was in the range of 30 to 40 decibels, which would indicate that this was predominately a conductive type loss, preventible by adequate care.

To continue with some of the observed characteristics of these children, 13 of them were noted to have poor oral-motor co-ordination. Six of them were mouth breathers. Fourteen of them were said to be tongue thrusters (whatever that means, or is worth). Eighteen of them had voice disorders other than hypo or hyper nasality. The majority of these had some variety of hoarseness, although there were children with abnormalities of pitch and volume. Nine of them, (that's 30 percent) had repeated at least one grade in school. I cite these statistics to draw your attention to the fact that every child who has a cleft palate does not have merely a cleft lip or palate. Lest we become enarmored of these statistics, I just want to recite to you "The Clothing Store Experiment." A friend of mine went into the clothing store. "I want to buy a suit," he said. "Yes Sir", said the salesman. "We'll put your measurements through our computer." "I havent much time" said my friend. "You don't need much," said the salesman. "We can do in a few seconds what used to take a tailor several hours to accomplish." "Here's your suit, it's a cool powder blue." "But, I don't like blue," said my friend. "Some people never get the word" said the salesman. "This is your preference according to a recent survey." "The suit's too small," groaned the customer. "The average size of our customer is 5 feet 10 inches and they weigh 150 pounds," our salesman assured him. "But I'm 6 feet two inches, and I weigh 180 pounds," replied my friend. "I'll put it on, but I don't think I can button or zip anything." "A public poll shows that 85% of our customers have confidence in our system," replied the salesman. "But it doesn't fit me," said my friend. "The left pant leg is too small and the right pant leg is too baggy." "That's to allow for the standard deviation, with 3 degrees of freedom," smiled the salesman. "Okay," said my friend, "but what's this?" pointing to a little bit of extra material. "Oh! that's a little skirt. 60% of the people in your age bracket are women, and we have to take that into account." "I don't really like it, but I'll take it," sighed my friend. "I'm sorry, but I can't sell it to you," said the salesman. "We've just run your measurements through the computer and you don't fit our criteria of statistical significance at the 5 percent level of confidence. As a matter of fact, according to our criteria, there's only 1 chance in 238,000 that you even exist." "But, what shall I do?" said my friend. "I must have some clothes." "I suggest you change your experimental design basing it on the null hypotheseis" waved the salesman. "Toodle-loo."

Before we become mesmerized by all the statistics that have been deduced to describe cleft palate, let's remind ourselves that the child that we see is only one child, and will have problems that are peculiar to him. It isn't necessarily relevant that 30 percent of cleft palate children distort the sibillant sounds, or the plosives. What really counts is what this particular child does. Hence, our role as a clinician in making an examination consists of more than the mere identification of the defect, and the prescription of a course of action based upon some general concept of how cleft palate children are structured, and how they behave. In this context, I recall, with a little bit of consternation, the reply of a speech correctionist to my question concerning her program of therapy for a child. She said she'd been working with this child for some months now and I said, "What have you been doing?" "Well" she said, "I have run through Dr. so and so's 20 lessons." The child still spoke unintelligibly, and so I said "What are you going to do next?" "Well I've started to go over the 20 lessons again." Now, the thing that was wrong with the 20 lessons was that they did not apply to this particular child. They may have worked for some child, but they didn't meet the problems of this one youngster. Now, let's turn our attention to diagnosis and examination. I think you probably all subscribe to the notion that diagnosis is not something that you do once, but that it is a continuing process. There is no sharp line between examination and therapy. You simply change the emphasis throughout the time you have the child under observation. You're constantly trying to guide your teaching methods and your plan of approach in terms of what you think you see happening to the child. Dr. T.R. Harrison writing in the "Principles of Internal Medicine" says "Diagnosis implies the discovery of all the various factors that are responsible for the illness. It involves an estimation of the extent, and severity of all functional and anatomical changes which produce the disorder and it necessitates an insight into the rate of progress and probable outcome. It attempts to correlate and integrate the facts obtained from the history, physical examination, and the laboratory investigations." This definition was in reference to internal medicine, but I think it doesn't take too much of an adaptation of these statements to make them apply to the special methods of the speech examiner. It fits pretty well the role that we play.

What's the purpose and the scope of the speech examination? There are eight things that we do. First of all, we have the identification and description of the speech problem. We want to know how the child arrived at this point, and so we collect a history, but I'll put it second, because so often we start with a history and thus we have a preconceived notion of what we expect to see and hear. I was impressed, many years ago, when Dr. Emil Froeschels first came to this country. He said to look at the child first and then inquire into the history. Third, out of our examination and our collection of data from other specialists, we begin to try to assign an etiology. Of course, what we're interested in is a dynamic concept of etiology, not just the things that were present in the past and no longer effective, but the things which may be serving as deterrents now to the improvement in the speech pattern. And, then we'll come to something that we'll call the diagnosis. Actually, all of this is part of the diagnostic process, but you do need to make a statement which describes in simple terms the major speech problems and the etological factors which seem to be behind those problems. Then, in order to be able to forcast the future, you try to estimate what will be the outcome of this child's physiological, anatomical, mental, and social problems if nothing is done, and you try to forcast the probable outcome if you initiate a certain plan of action, and are able to carry it out consistently and with co-operation of all essential disciplines. Next we're concerned with the interpretation. This has a twofold aspect, I think. It's not only got to do with the interpretation of the findings from the examination, but it's got to do with the interpretation of the significance of this defect, and this speech problem, to the life of the patient. Time and again, I have in my own perfectionistic way wanted to prescribe a plan of action, only to find out the patient really didn't care. I thought I could improve the voice quality, and the patient didn't really see anything wrong with his voice quality. Or the economic circumstances of the parents, or the location of his home, made it unfeasible to attempt the massive attack on the problem which I thought should be undertaken. So the significance of the speech disorder to the patient is of great importance. Lastly, comes the development of a plan of action in which you attempt to become realistic, and make a differentiation between an ideal plan and a practical plan. Finally, you've got the responsibility of reporting the findings, not only to the examination, but also reporting your findings as a consultant to other specialists, and in reporting the findings to the patient and family.

We turn now to a discussion of the speech problems of the patient, and a description of these. I want to remind you of the valva structures that underlie speech. We attempt to identify the places, or sites at which constriction, closure, or opening will effect speech. These functional valves mediate particularly the formation of consonant sounds, and also some of the vowel sounds. First we identify the glottal level, second the palate pharyngeal valve, third, the linguo-velar valve, fourth the linguo-palatal valve, fifth, the lingual alveclar valve, sixth the linguo-dental, seventh the labial dental, and eighth the bilabial valves. Out of these eight valves you may construct the place of articulation and the manner of articulation. You're familiar with the charts that show the distribution of consonants by place and manner of articulation. The articulatory defects that we're concerned with usually result from interference with the place, or the manner of articulation, or both place and manner of articulation. We have disturbances of the aspirate quality contributed by air pressure going through these closed or constricted valves. When we attempt to describe the speech of these patients, we usually do so with reference to omissions, distortions, and substitutions. In my opinion, and I realize that this statement is subject to challenge, the omissions and substitutions in cleft palate speech are primarily due to factors other than the cleft lip and palate. The thing that the cleft lip and palate does is to bring about distortion of the speech sounds through maladaptive placing of the articulators, or maladaptive manner of articulation, or both. The pressure differences and the timing of articulation of a word depends not upon whether voicing was present, but may give the listener an impression of a voiceless consonant. And lastly, they may include resonances that are not usually present.

This is the speech spectrogram of a young man who had bulbar polio, and after his illness and recovery from the acute phase he had paralysis of the palate. In order to help him compensate for this we constructed a "lift appliance." The lift consists of a splint on the back of an oral appliance, and this elevated the soft palate up to a point where it almost closed the nasal pharyngeal valve. It allowed enough room for nasal breathing, but greatly improved the patient's speech articulation, because the only thing wrong with his speech articulation was that he had an open palatal-pharyngeal valve, due to the paralysis. We made a spectrogram showing the appliance in place, and without the appliance. I call attention to a number of features which seem to distinguish nasalized speech. First of all, you get extra resonance bars. He's slightly hyper-nasal, because we couldn't close the palatal pharyngeal valve completely, or we would have made a mouth breather out of the patient. We didn't want to do that. You find the introduction of extra resonance bars, you get some broadening and lack of definition of the bar, too. You find that extra strictions are introduced, and the loss of the definite consonant boundries. There's a fairly shape differentiation between the vowel and consonant boundries of a normal speaker, but not of the cleft palate speaker. You find the vertical strictions that indicate frictional passage of air through the nasal passages, and you find there is much less shaping of the vowel sounds, which means that vowel articulation also, is disturbed. This fellow had no paralysis of the tongue or lips, when the defective palato-pharyngeal valve was even partially corrected, then you found that the articulation, as well as voice quality, were substantially corrected. This young man had no difficulty being understood when he talked, after installation of the appliance.

I want to call these sound distortions malphones, and I do this because I'm an innate punster. You're familiar with the concept of phonemes and you know that the individual, but normal variants of the phoneme are allaphones. I want to call the defective allaphones by the name "malphones," or "bad sounds." I will show you how we describe these, because I think it's helpful to pay more attention to how defective speech sounds are made than we have been accustomed to doing. We've been so oriented toward ear-training and listening that time and time again when I've met former students, I'm a little embarrased because many of them who are providing therapy haven't even looked in the child's mouth. They don't know that he has missing teeth, and may not know that the tongue shows poor motor coordination for other activities than speech. They may not know that there is a foreshortening of the palate as well as a scarring from a postoperative cleft. They may not know whether the removal of the adenoid tissue created an extra problem for this youngster, and they may not know that the tongue deviates in particular ways to cause the malphones that they hear. It's with the hope of directing your attention to some of these factors of placement and movement that I want to present some of the little signs that I use for diacritical marking of malphones. You'll find that according to Spresterback, Darley, and Rousse, of the distortions, substitutions, and omission of consonant sounds, 37 percent of the misarticulations were due to omissions, 35 percent were substitutions, and 28 percent were distortions. Now whether or not these statistics are born out by other peoples' studies, it would indicate or reaffirm what I was trying to say awhile ago, that about 1/3 of speech malarticulations can be attributed to the cleft lip and palate either because of it's direct or indirect influences, and possibly the other 2/3 are related to factors that would have been present even if the cleft palate had not been present. In a development of a system of phonetic diacritics, I've attempted to leave the phonetic alphabet a little bit. Trim, who published in the English Journal Speech, a number of years ago, suggested the use of IPA symbols for describing distorted speech. The modifiers he suggested are adequate to describe some abnormal articulations, but have definite limitations. I have described a series of diacritics which are essentially, pictographs. One group of these modifiers suggest the structure that's involved, and are oriented as if the patient faces your left. One sign represents the upper lip, another the lower lip, a sign for the upper teeth, the upper central incisors, and the lower central incisors. The tongue tip is represented by just a dot. The tongue blade, the root of the tongue, and the tongue back are indicated by special signs. For this group of signs it's necessary for you to think of it in terms of the patient facing you. If you put a little sign beside the consonant, then it means that the right cheek was involved, usually this means a puffing of the right cheek, as you get where there is flaccidity of the muscles. Don't think that you don't encounter this sometimes with a cleft palate patient. They are subject to neuralogical problems, just like anybody else. The left cheek, where the lip rounding is involved, where the spreading of the lower lip is involved, this is indicated. And this indicated that the nares are involved, and this indicates that it's the patient's left, or the patient's right.

Now, I'll show you how some of these things work in diacritics. For instance, you'll see the upper lip described, and then if the patient said "pa", which was an attempt to produce a "p" sound with the lip in contact with the incilas edges of the upper teeth. This is a shorthand way of indicating abnormal phonetic movements. I prefer to describe the whole word the child says rather than to use only a check mark to indicate that some sound was omitted or distorted. This method of transcription would indicate it's a "p" sound, not a "f" sound, and that it had a plosive quality that was sufficiently close to the "p" consonant to warrent designating it as such. It would show that it is distorted, and not only distorted qualitatively and acoustically, but also that the manner of production is abnormal. If the person brings his upper lip in contact with the lower teeth, as sometimes happens in these youngsters that have considerable maloclusion and prognathism of the lower jaw, you may get what you'd call an inverted articulatory relationship, and it would be indicated by another sign.

Now, the incisors become significant, particularly the tongue tip consonants, and if the youngster protrudes his tongue between the teeth you would indicate it so as you put the upper incisors above, and the lower incisors below, and the consonant phone inbetween. Now, this is for a child not who has said which is the "th", but for the child who has said "s" in which there is a definite attempt to produce the "s" sound. If he said "ta" acoustically it may sound pretty good, but it is not formed correctly, and it also may indicate that he postures the tongue for his speech in such a way that as long as you leave the tongue in this general postural orientation you are going to have difficulty in helping him make the sounds normally. If you indicate that little circumflex above the consonant, it would indicate that the "ta" is made with the tongue tip depressed behind the lower teeth and the blade of the tongue then provides the plosive element. Instead of saying "ta" he said "taa". It doesn't sound too different you see, but, it's physologically a different orientation and worth our noting. More frequently then, perhaps, you realize children who sound as if they were making a fairly intelligible "k", "g", or "l", do so with the back of the tongue in contact or constricting the pharyngeal wall. These sounds resemble the consonants that they are trying to produce, but of course, they are not produced normally. Some of the "l's" are deceptive in the degree to which they approximate a dark "l" sound. You have to watch carefully while the child articulates the consonants. Once in a while you do get a puffing of the cheek as the child talks, which indicates that there is a flaccidity of the right or left cheek. You may also symbolize the characteristic pinching of the nares, which so frequently you find in palatal deficiencies. This anterior constriction contributes to the mixture of hyperhypo nasality in these youngsters.

The next group of diacritics refers to airstream distortions or airstream modifications. These are indicated by series of arrows. These are all the various types of lisps. So often the defect is described only as a lisp, and without indicating the nature of the malarticulation. In dental deformities and malocclusions it is important to know what kind of malarticulation is producing the defective sound. If the person makes an interdentalized "s" sound, you can indicate that the air stream is proceeding in the midline, but the tongue is placed between the teeth. If he makes an occluded "s", you'll find a closure of the pattern all the way around, and then there will be a release, of course. In order to do that, I simply indicate that there was a blockage, or an interference with the airstream at that point. If he makes a left antero-lateral lisp, usually the deviation of the tongue will follow the line of the cleft, in a unilateral cleft. Partly because the teeth don't come down to the normal occusal plane on that side, the "s" is distorted. If he does the deviation to the right, it's symbolized to the other side. If he retracts the tongue tip and doesn't get sufficient narrowing of the tongue blade, you can show it with the double arrow, and if he gets a nasalized "s" sound, then you will indicate that he's attempted a frictional sound, but that he's done it with the back of the tongue in contact with the posterior pharynx.

To summarize the steps I take when I examine a child, let me just suggest the steps I like to run through in evaluating the structures, and try to relate them to the speech that I see. First of all, in just looking at the face of the child and picking up evidence of facial deformity or facial asymmetries, I look for such things as hypertelorism, and the wide separation of the malar bones --these things that would indicate the existence of multiple problems on the part of the child. When you're first talking with him, hoping to get his spontaneous response to your questions, you look meanwhile to pick these things up as you talk with him, and relate to him. You look at the lips, noting not only the scarring, but whether or not it has adequate length, trying to get an idea of the mobility of the upper lip, trying to get an idea of the relationship of the upper and lower lip, indications of lower lip redundancy, and narrowing of the lips and mouth, in case this has been an unfortunate surgical result. Fortunately we're not seeing so many of these deformities in recent years as we used to, from the earlier and more primitive types of surgery. I look for evidence of lip cysts, or pits, which so often occur, sometimes in those that have submucus clefts of the palate. Meanwhile, listen carefully to the speech of the individual. Try to note nasal deformities, obstructions, evidence of alar collapse or the flattening of the nose, especially in case this child shows any sensitivity to his appearance. Move then to the examination of the mouth cavity, noting first of all the appearance of the teeth with the jaws in occlusion, pulling the cheeks aside with a tongue blade so that you can see all the way back on either side. Note whether the teeth come down to the line of occlusion, and whether there are cross-bites present, missing teeth, etc. Meanwhile, as you get him to open his mouth, you try to make some observation of oral hygiene, and whether or not the teeth are being properly preserved. I worry more about the teeth of some of these youngsters than I do about a lot of their other problems, because so many of them face the possibility of reaching young adulthood with virtually no teeth in their mouths unless proper dental care is instituted early and maintained throughout. As you know, these children cannot afford to loose their teeth, and so many parents mistake the 6-year molar for baby teeth, and don't try to preserve them. It's also important to make sure whether there is a dental prosthesis in the mouth. This is easy to miss sometimes. Look at the palatal deformity if palatal deformity exists, for the collapse of the maxillary arches, and indications of inadequate space in which the tongue may operate, and then defects of the palatal pharyngeal valve, and of course you know you can't really evaluate the palatal pharyngeal valve by mere oral inspection, and then you look for lingual deformities and malcoordination. Because you cannot observe the palate directly, and because the diagnostic centers of the type that undoubtedly you have here may not always be available to a person working in a public school or in communities where there are not extensive diagnostic facilities, we should remind ourselves that we do have means available to evaluate palato-pharyngeal function with a fair degree of preceptiveness. And first of all, we depend on that old standby, the ear. There's far more to be accomplished by listening than by almost any other means, and there are ways of refining your listening. One of these, which I'm sure you've used many times, is a rubber tube. It only costs a few cents, and you don't have to get a fancy glass tip of any kind - just take a piece of drinking straw and stick one end of the tube in your best ear and then listen to the patient talk. If there's some nasalization of sound, you can hear it very easily. Place the straw across the front of the mouth, and you can get an accurate idea of where the distorted airstream may be emitted. Your're all familiar with the use of a steel mirror, as a means of detecting nasal omission, and this is another very simple device which I encourage you to use frequently. While you're listening and inspecting the mouth, I suggest that you take a tongue blade and as the child is saying "ah" elevate the palate with the tongue blade, if you don't do this routinely, I think you should. You may gag the child once in awhile, but I think you'll recover from this. If you dodge quickly, you'll be alright! Assuming that everything goes alright, you simply listen for the change in voice quality which is produced as you elevate the palate. You may be astounded at the amount of change that takes place, and this will be an indication to you of the amount of voice quality change that you could hope to achieve either by surgery, or prosthesis, or by training. You'll have to make some decisions as to which of these procedures is best employed. In the course of oral inspection, see whether or not the palate contracts equally on both sides. The rationale for blowing also comes into consideration. I'm not going to try and tell you how useful blowing is, but I think it tells you something that's useful to know about the function of the palato-pharyngeal valve. As in anything else, you have to use it with some clinical judgment. There are various devices that are used, spirometers of various kinds, and various kinds of air pressure gauges which can cost you up to $150, or so, or more. And various kinds of air flow indicators. The device I shall demonstrate is a graduated tube in which there is a little black ball. When you blow on it, the ball rises to the top. I don't think it's worth your time trying to get extra fine measures. Ask the patient to hold his nose and blow. Record "aided blowing" and then have the patient blow without holding his nostrils. This is called unaided blowing. Test him now on inhalation. He must inhale, he can't do it by sucking. The palato-pharyngeal valve has to be closed completely, unless he's stopping the nares by pinching the nostrils. This measure is subject to error, but I think it provides some useful information over a period of time; use of such a device can help the child to oralize the direction of the air-stream. Actions of the palato-pharyngeal sturctures in speaking and blowing resemble each other much more than blowing and sucking, or speaking and sucking.

In summary, I've tried to give you an orientation toward the speech examination of the cleft palate child, orienting us first to generalized problems, and secondly to the problems that may be related to the cleft lip and palate itself. I have drawn attention to the direct and indirect effects of deformity upon speech. I've suggested some of the stages of the examination needed to make a comprehensive examination. I have discussed speech distortions and have presented a way of describing these speech distortions. I have suggested that when you're trying to evaluate the functional efficiency of the palato-pharyngeal valve in it's effect on voice quality, that first of all you need to listen, and secondly you need to employ assistive devices, some of which are quite simple, but can contribute useful information to you. And we have described the examining process as a continuing one, scarcely distinguishable at times from therapy.

Translating Diagnosis in Therapy
Dr. Harlan Bloomer

I'm going to talk with you about speech therapy for the cleft palate child. This is something that many of you know more about, from an intimate standpoint, than I do, I think. There is no substitute for the daily contact with children that have these proglems, and I think that many of you are in a much better position to learn the intimate details than a person who has to combine research, clinical work, teaching, administration, public relations, and a little bit of everything.

I want to give you a little orientation, however, to my concepts of speech therapy. I first of all want you to think a bit about how we use speech. I think it falls into two general categories, the personal uses of speech, and the social uses of speech. And there are four subcategories. First of all, speech as oral play. This is the first kind of oral activity that the child begins to develop, after the child is born and begins to go through the little "oh's and ah's" and the changes of sound that are so delightful to listen to in the 2 and 3 month old babies. They apparently enjoy it for it's own sake, and we continue to do so throughout our own lives. Sometimes it's helpful for us to have an audience, but really the audience is often times secondary to our enjoyment. We like to hear ourselves talk. We become very sophisticated about this, but in underlies a good deal of our need for expression, and we spend a good deal of time at it. The second personal satisfaction that we gain from speech is that of a form of emotional expression. In some instances, this serves as an emotional release, and in many instances it's a form of anxiety reduction, and we know many times we seem to gain release from our problems, the pressures that afflict us, by just being able to talk about them. A third way in which we use speech personally is for self-communication. We talk to ourselves almost constantly, you know. Whether you do it with your lips moving or mouth moving is immaterial. You explain things to yourselves verbally. We talk ourselves up, or we talk ourselves down, and sometimes I think if we could learn not to talk ourselves down constantly, we'd be much more successful in the things that we do. And the fourth general area in which we use speech personally is in role playing. All of us must play a role. This is not news to you. You change your role throughout the day, according to your audience. If you're in one profession, you adopt one kind of role; if you're in another, you take another kind of verbal expression that we think fits the personality and fits the function of the profession. And you know how ill at ease you would be if you would be if you went to your physician and he talked to you the same way a car salesman talks to you when you go to buy a car. And you know how unimpressed you would be if the car salesman talked to you as the physician does. Children learn this sort of thing very early in the process of learning to role play. They go through a lot of experimentation, and when they imitate the good guys and the bad guys, not only does the motor behavior conform to their image of the role, but language, their intonation patterns, the whole verbal expression, does so.

Now for the social uses of speech. Malinowsky, many years ago in his writing about primitive cultures, called attention to speech for "photic communion." This is speech just for sociability. He says that the Eskimos, when they greet each other, rub noses. In our culture we shake hands with people, or we don't shake hands. We say "Hi! How are you?" and you really don't care too much about how they are. As a matter of fact, if they asked you how you are, and you really told them, you'd lose your audience in a hurry. The exchange of greetings is of establishing a relationship. It does provide a basis out of which more critical features of speech sometimes develop.

The second main use of speech is for the transfer of information and the expression of ideas. We do attempt to represent to our audience some intent or some meaning.

And thirdly, we use speech, or we use the withholding of speech, as a means of aggression or defense. Fortunately, as we become civilized, we become to rely more and more on verbal expression as a means of aggression and defense, rather than upon a more physically oriented means of aggression and defense.

And fourth, we use speech as a mechanism for eliciting cooperation. In it's more sophisticated ways, this becomes speech for persuasion. The reason I call attention to these uses of speech is that when a person is deprived of facility of communication for these purposes, then he suffers certain personal and social consequences. He fails to communicate certain information. He loses social control, there are certain limitations imposed on his educational achievements. He tends to become maladjusted, and he tends to develop depreciated self-image. He experiences social frustrations, because of his difficulty with communicating with others. His economic opportunities are lessened, and because of the nature of his speech disability, he often times runs the risk of some physical consequences, because of the pattern of muscle movement which he develops. This is most notably shown in the function of voice disorders, but to some degree shows up in the development of the oral structures, particularly the dental occlusions, because of the pattern of muscle behavior which the child or adult develops.

It's in this kind of context that we want to try and develop our notions of therapy for the child of cleft palate. I think we have two goals. One of them stated positively, and the other stated negatively. The first goal has to do with the realization of the best potential of which the patient is capable, or at least the potential that he's willing to attempt to accept. And this goes back to what I tried to say this morning. We have t get a different goal for different people, in line with their own personal needs. Negatively, what we attempt to do is the avoidance of factors which will leave the patient less able to deal with his life situation when we're finished with him. It's a kind of cliche to suggest that when you start therapy with a patient, you begin with him where he is in reference to his physical, physological, and social maturity, and that you need to base your point of beginning upon an analysis of his needs.

When I talk about this, one of my own failures comes vividly to mind. I had had a chance to observe from time to time, and to attempt to help a young woman who, when I last saw her, was about 29 years of age. I saw her and her twin sister. Both of them had clefts of the palate and neither of them had been very successfully cared for surgically, orthodontically, or from the standpoint of their communication, or their personality development. These two girls had both succeeded in getting reasonably workable prosthetic appliances, however, and one of them, the one about whom I'm going to speak now, had gone on to take training as a medical technician and was well-employed. She decided that she wanted a better prosthetic appliance, went to Evanston, got this appliance and spent $1,000 for it. It may have been a good one, but I never saw it. In the meanwhile, she had heard about the pharyngeal-flap surgical procedure, and she decided that this would be the thing. She gave up the prosthetic appliance and had the pharyngeal surgery. By many standards this would be considered a successful bit of surgery. She was able to produce voice quality which was not nasalized. She was able to make complete closure of the palatal-pharyngeal valve, but her speech ir conversation really didn't improve very much. This is where I entered the picture. She came and she wanted my assistance, and I tried to help her. And each time I thought I had helped her, I always ran into a blank wall. She didn't use what she obviously was capable of using. She now had a functional valve, she could produce non-nasal speech, but intelligibility of her over-all speech did not improve in the least. She did not give up a single malarticulated consonant. Her voice was still hypernasal. In my naive way, I thought maybe she needed encouragement. However, as the therapy session progressed, she would look at me and break down in tears, and we had to start all over again. Finally, both of us felt that we weren't getting anywhere, and discontinued the relationship. This has bothered me greatly, because here was a girl who had, I thought, the necessary potential for good speech, but who, when I came to the point where she could really make progress, was somehow unable to give up the picture she had of herself, and the way she sounded to herself, that if she gave it up, she became very threatened. I never did succeed in finding what it was that so threatened her. But I'm convinced that this was one of the deternents to progress. And this is why I keep coming back to the patient's own orientation, the patients own feeling of need, and the degree at which he is willing to accept change.

If the examination we do is going to be useful to us in terms of therapy, we have to go back and ask ourselves some questions about the mechanism which the speaker has. We have to ask ourselves whether the structures work for speech, or whether they have the potential for work. We have to ask ourselves if they do not. Why not? And then whether we think they could be helped by surgery, prosthesis, orthodontia, or speech therapy, medical treatment or anything else. And then we have to ask ourselves, by what age, such things should be accomplished, and whether the structures not only work, but whether they're cosmetically acceptable, what the patient's attitude toward his appearance is, and what is his attitude toward his own speech, and the use of it is.

Now, to goals of speech improvement. Our first one is to enable the child or adult to use acceptable speech easily and spontaneously. The girl that I just spoke about could do these things, but she couldn't do them easily or spontaneously, and apparently would not do them for conversation. Secondly, we want to help him gain a better, or at least a more realistic concept of his problem, and the treatment program that is planned for him. And third, we want to help him accept the value of speech improvement. We want to help him gain a feeling of achievement and improvement as rapidly as possible. I think sometimes in speech therapy we have been guilty of letting the patient go in therapy for 6 months or a year, and we've been content with minimal gains. I don't think this is necessary, and I think it's not desirable. I think if you can't begin to sense change, and sense it fairly rapidly, then we're missing some of the influence that we should be having. Fifth, I think we want to help the child participate actively in social situations that are suited to his age level. Sixth, I think we want to enable him to use speech patterns that are adapted to these typical social situations. Lastly, I think we want to help him develop a healthy attitude toward speech, and it's personal and social functions.

If we do all this, we have to have some basic assumptions that sort of unde lie our approach. We have to approach children as if they had dignity and integrity, and intelligence. Those of you, practically all of you are teachers, know that children are capable of work, and that all that they do doesn't have to be fun. They can have a great pride in accomplishment, and when they accomplish something, this will encourage them to greater improvements. It is our assumption that the conversation is a better medium for training than mere drill. And lastly, that all that is accomplished is not accomplished through "teaching". This latter point has been borne in upon me in increasing intensity within the last few years. It's been somewhat humbling for me to have this experience. I've been accustomed to advising our plastic surgeon or our prosthodontists, or other people with whom we work, that a child should have surgery, but have stated that you know you can't expect spontaneous improvement of speech. Just look at all the speech problems that he's got! In a number of instances it has not been possible to provide this speech therapy, and some 6 months to a year, or 2 years later, I will see this child and his speech intelligibility has become quite good, as a matter of fact, these consonant distortions which I have noted a year or 6 months ago had disappeared. So I make some inquiry as to where they've been getting their therapy, and I've discovered they've had no speech therapy. This sometimes happens for a 10 or 11 year old child, sometimes it happens for an adult, long after they're supposed to be able to acquire these things spontaneously. I saw a youngster just a few weeks ago, a boy of 14 or 15 years of age who had had a pharyngeal-flap procedure. I had prescribed, of course, speech therapy for him. Three years later I saw him and his speech was remarkably good. I think he's probably one of the few who could pass what I call the "blindfold test". Well, I asked the mother if you weren't able to provide speech therapy for him, what did you do? "Well", she said, "you did suggest that maybe he learn to play a musical instrument," (I blushed slightly). She said he got a trumpet, and he had played in the high school band, and since then his articulatory problems are completely gone. Completely. He may have a moment of hyper-nasality now and then, but certainly nothing objectionable.

You may read in all our professional journals about the controversy on blowing exercises. Are they useful? Are they not useful? Is blowing like speech, etc? All I can tell you is that this is what happened.

This was what the boy was like before, this was what the boy was like afterwards, and something had happened in between times. Of course, once in awhile you get yourself in a foolish situation. As I was telling Dr. Van Hattum last night, I had another youngster who came along and showed considerable improvement in speech, also. By now I knew enough to ask about these things, so I inquired whether he had learned to play a musical instrument. "Oh yes, indeed" said his mother. Just as I was about to ask if it was a clarinet or trumpet, the mother said "He plays the drums."

In those instances when we are able to provide speech therapy, we must define our general goals in reference to our basic assumptions. Having decided which articulatory maladaptations are critically related to the defective sounds that you hear, you must try to teach adaptive rather than maladaptive movements. As far as I'm concerned, you approach these children as <u>articulatory problems primarily</u>, and <u>secondarily as voice quality problems</u>. We work on the timing relationships, which I spoke of this morning, too. The timing relationships between articulatory movements and voicing and we work for improvement in phrasing, as well as voice modulation. In our work with these youngsters, we feel it's extremely important to have both group, as well as individual therapy, and I know that many of you share this viewpoint. It helps them develop a desire to be understood. It helps them in a development of an appropriate self-image. It helps them develop some pride in the improvement of their speech. And it enables us to introduce some counsel as we work with them. One of the crucial factors, I think, in trying to carry on therapy, is to devise a means of telling in what way you're making improvement.

I want to turn your attention now to two ways in which I think you can test yourself a bit. One of them has to do with the use of a rating scale. One of them has to do with what I think is considerably better, and that's the use of an intelligibility procedure which is similar to, but a little bit different from, the ones I think are being used elsewhere. First of all, the rating scale. You are quite familiar with the notion, in trying to evaluate progress, that it's often times difficult to decide how much of the voice quality is being affected by the articulation, or how much the articulation is being affected by your judgements of voice quality. Attempts are made to play tapes backwards to try and separate out these factors. In the use of this rating scale, I have not attempted to do it in that way, we've attempted to use the speech as it is normally produced. We've asked the children to count, and asked them to enunciate some test sentences which we've given them, and which we dictate for them, and merely ask them to repeat.

This evaluation uses a five point scale. All we've attempted to do is provide some little description to go along with the numerical ratings. We did this because we wanted to run a series of pre-and postoperative pharyngeal flap cases through. And all we did was to mix up the pre- and postrecordings, just scramble them and play them to a group of listeners, who had no previous acquaintance with the recording, and who had no previous acquaintance with the evaluating system. And simply asked them to grade them. There were, as you might expect, differences between the judges, but the consistancy and the amount of agreement, considerably exceeded what we had expected to be the case. As you can see, these do not substitute separate gradations, but there's some area of overlap. It's hard to describe degrees of anything in a way that makes it possible to categorize this discretely. We attempted to focus on the articulatory aspects and the possibilities of improvement.

We turn now to the voice quality. We described levels, or degrees of hyper-nasality. We had a rating of no hyper-nasality. This is, as the judge perceived it, as normal rating. Some hyper-nasality, and we attempted to describe that, the mild, the moderate, and the severe.

This was an attempt to get some kind of an operational description of the quality. The third thing was attempted to do was to describe degrees of hypo-nasality. This turned out to be the least successful of all, because so many of our judges had trouble recognizing hypo-nasality. We realized if you are going to use this as a concept, you would have to spend considerable time in training our listeners. This gave us a way of trying to grade the degrees of severity, if you want to put it that way, in the patients before and after operation. We happened to do it in reference to a surgical procedure, without reference to therapy, but I see no reason why it cannot be used for that also.

A procedure that we have been much more interested in is one that uses the Fairbanks Rhyme test. Those of you who are familiar with the Fairbanks test know that there are scramblings of 50 words in which you have rhyming words, such as "fine", "pine", "nine", "line", or "dine", etc., and he has equated these according to frequency of occurrence. These are some consonants sounds that do not occur in the list. The value that it has as a listening test is that the listener never knows what word it was intended to be, so that when the speaker reads the word list, he always reads the same word list for himself. The words can be almost infinitely scrambled as to order of occurrence, so it restricts the kinds of judgements the listener has to make. All he has to do is to write down the word that he hears.

We've done it this way, we've also done it when they've known what this part of the word is, and all they have to do is to supply the consonant. This latter procedure considerably increases the possibility of his making successful judgements,but it merely moves the scale over to the right. It simply makes his percentages of successful judgements that much better.

This gives you an idea of what we're trying to do I'd like to present some slides to show what the outcome was for these children. Boys, who attended the University speech camp were there for 8 weeks, and were tested 4 times during the program as a way of trying to judge whether or not any change in speech was being achieved as a result of therapy. There were 10 subjects, and they were tested 4 times. Take subject no. 3. You can see that the number of errors which he made prior to therapy averaged 29. By the second week he'd gone to 13, by the second period, fifth week he had reduced the number of errors as recognized by the listener to 6. By the seventh week he'd come back up to 10. Now this is interesting, I think, because of the variability and response; in a sense you're testing the listener here, but the listener is performing the same kind of operation, the child is performing the same kind of operation, and all the listener is doing is judging what it was he heard. He doesn't have to judge whether the child substituted one sound for another sound. He's not trying to judge whether or not he said sign or sigh. All he has to do is judge what the word was, as he heard it, and write it down. If we take these and divide them up according to the number of instances of misidentification by the listener, when you can categorize according to plosive or sibilant, nasals, fricatives, or vocalics, affricates, and we take no. 3 again. You'll see that for the first testing the plosives were misidentified 10 percent of the time, but for the post-therapy, at the end of all 8 weeks session, none of them were misidentified. The sibilants 48 percent at the outset and 6 percent after 8 weeks. For the fricatives, 4 percent at the beginning and 1 percent at the end of 8 weeks. Look at the nasals. Usually when we read about cleft palate, we say to ourselves, and we do this quite glibly, children who have cleft palate don't have difficulty with the nasal sound, you know. It's the non-nasal sounds that they have difficulty with. But look at the instances that the articulation of the nasals was mistaken. If you listen to these children who have cleft palate and hypernasality, see if you don't hear a difference in the nasal quality as well as the supposedly non-nasal consonants. I think it's there, if you listen carefully. Look at the vocalics, notice that misarticulated 22 percent at the beginning and 4 percent at the end. Affricates 91 percent at the beginning, 21 percent at the end.

At the same time we were doing this, we asked these kids to blow each time, this was done on a pressure gage, and as I've indicated to you, it's a very crude measure. Nothing like the refinement that Dr. Subtelny and Dr. Van Hattum are trying to develop with their air-flow measuring devices. Subject no. 3 got something that represented as 100 percent closure the first time, at the end of the third week he got something that ranged from two trials between 79 percent and 83 percent. You remember on the articulation testing that he improved in articulation in that time. At the end of the fifth week he was even worse off and at the end of the fourth week he was down to 55 percent efficiency by this test. I don't know that this means, except maybe the test, I don't know what it tests. We were unable to find any consistent relationship between their performance on these tests and their response to therapy.

Subject no. 3 shows how many times plosives were misunderstood for another plosive, or plosives were misunderstood for a fricative phone, or a vocalic, or a nassal. No. 3 at the outset, it was interesting for us to see how many times plosives were confused (and different categories) between the different modes of production. You see in this case 49 percent, he confused plosives for plosives and this was the most prominent misidentification of the plosives. Now we've only put in here the number of instances that exceeded 25 percent so that's why you don't see anything adding up to 100 percent here. Look at his sibilants, you'll see that 99 percent of the time the listener considered these to be some form of nasal consonant. And, if you look at the nasals again, the number of times the nasals were confused for other nasals. Vocalics, 54 percent of the time vocalics were confused with other vocalics, 27 percent of the time vocalics confused with fricatives.

Every time you select a procedure like this to attempt to evaluate your progress, you have to be satisfied that you're only evaluating a certain phase of progress. It doesn't tell you anything about how the child converses in normal speech. It doesn't tell you anything about whether he uses speech more freely now. It doesn't tell you anything about if he uses it more easily. It doesn't tell you what he does wrong in terms of the movements performed. It is no substitute for using your eyes and ears, as you would as a skillful clinician. But it does suggest that there is another way of trying to determine somewhat objectively the changes that have taken place, and being able to subject this child's speech to a kind of testing procedure that doesn't require you to assemble a whole battery of skilled listeners. You see, if you don't know the list that he used yourself, and have not familiarized yourself with the list, you can judge just as well as anybody else, or you can get someone else to do your judging for you, and they don't necessarily have to be a skilled listener at all. The only thing that you would do is use the same listener again and again. But as far as we know, he really can't learn very much that will change his orientation as a listener, so I suggest this to you as one way of evaluating progress.

Now this has been a rather helter-skelter approach to the whole matter of speech therapy. What I've tried to do is suggest to you a kind of basic orientation toward the use of speech. I've tried to give you some consideration of the way in which you attempt to relate the structural and functional deficiencies, in an attempt to decide where you're going to begin with your therapy. I have suggested, to you some of the major assumptions which I think underlie approaching your therapy in this way, and I have suggested to you some procedures, or a procedure here. I think the second one is far superior to the other one. A procedure which you can use, which is not too complicated to use, and which will give you some objectivity in trying to decide whether you're making progress. I have on occasion been somewhat embarrassed to find that my own evaluation of the child's sppech and my own concept of when therapy should be terminated is quite at variance with the person in the public school who is working with this child. I don't know who is right, in these instances, but I know that we differ considerably, because not infrequently do I find the child reporting that he has been dismissed from therapy when he still has articulatory errors, when intelligibility is still poor from my standpoint, and when voice quality is a long way short of having achieved the level of which tc which, I think, he can go. Not it can well be that the speech therapist feels that he's done all he can do in that sense, or maybe the child has asked to be released, or maybe he's felt that the child isn't getting anywhere. Sometimes I get the feeling that the speech therapist let them go because they don't know quite what more to do. I would urge in these circumstances that the speech therapist seek somebody else's advice and consultation before simply dismissing the child. Because in many instances, I think something more, quite valuable, can be achieved for the child, if you get the proper combination of treatment procedures, and if the speech therapist feels that he has reached his own limitations, and I think, it's important to recognize when we have reached our limitations. Its often times possible, through the help of someone else, to bring this child to a new level of performance, and enable the speech therapist to continue in a much more constructive way. So I would suggest we not drop these children too soon, and not assume too readily that we've given them all that they have to gain from speech therapy.

Speech Habilitation in the Schools for the Cleft Palate Child

Dr. Edward Mysak, Executive Director
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Working with Parents

There is frequently little in the way of organized work offered in training programs for speech and hearing specialists in the area of effective relationships with parents of children with oral communication disorders; a similar situation exists when it comes to space in standard texts devoted to this area. At the same time, positive relationships between specialist and parents, and effective parental cooperation during the therapy period are often essential to successful therapy, especially in the more complicated disorders like those associated with cleft palate. Therefore, since the area of working with parents is an important one, and one which is often neglected, it might prove worthwhile to consider the following thoughts on the subject.

Parents Discussion Time

All parents experience problems during the child-rearing period; however, their problems are compounded if the parents have a handicapped child. Consequently, parents in general, and parents of handicapped children in particular, appreciate and find it valuable when specialists allow them time to speak about their problems, as well as their child's problems. It would be well, then, if speech and hearing clinicians could provide as much of this time to the parents of their cases as might prove useful.

Professional Self-Confidence

There is nothing more welcome to the parents of a handicapped child than to meet a specialist who appears competent and well prepared. Therefore, it is important for the speech and hearing specialist to reflect self-confidence, and thereby to promote parental confidence. Such a positive professional image usually arises as a function of: 1) a thorough knowledge of diagnostic and remedial procedures, and experience in the application of these procedures; 2) a mature, poised, self-assured presence, and 3) a realistic and carefully measured optimism concerning the child's ability to make progress in speech therapy.

Relieving Feelings of Guilt, Rejection, Resentment

It is not infrequent for parents of handicapped children (especially in complicated cases like cleft palate) to feel guilty about their child's affliction, or to resent its having occurred, or even to reject overtly or covertly their handicapped child. Such feelings, of course, are capable of impeding the total, as well as the speech habilitation of the affected child. Because the speech and hearing specialist has a rather regular and long-term contact with the child with cleft palate speech, he may be able to make a special contribution in this area. For example, he could: 1) allow parents to periodically ventilate, and help clarify their feelings of guilt, disappointment, etc.; 2) provide essential information with respect to the problem of cleft palate, the length and form of speech therapy, etc., and 3) make appropriate referrals when the parents' feelings of guilt, or rejection, appear excessive or not easily relieved.

Assisting Parents to Follow Orders of Other Specialists

In complicated cases like cleft palate, it is common for many specialists to be involved with the child's habilitation program. It is also common for them to ask parents to follow certain recommendations, e.g., caring for the speech appliance, practicing methods of oral hygiene, making periodic visits to the surgeon, or to the cleft palate team, etc. Again, because the speech and hearing specialist usually has a regular and long-term contact with the child, he may help interpret and remind the parents of the various recommendations.

Home Programs

Lastly, it is common for parents to want to take a part in the habilitation program of their child. When a good plan can be worked out in this respect, both parents and child usually gain from it. Depending on the kind of parents involved, there are at least two roles parents can assume in follow-up speech work, passive or active roles.

Passive Role

For those parents who may impede rather than facilitate the therapy program, e.g., the over-anxious, the over-critical, the demanding, etc., the relatively passive role should be offered. Therefore, rather than giving specific speech assignments to such parents, they may be asked to: 1) desist from carrying on any type of formal speech work, and to leave the speech therapy in the hands of the specialist; 2) become 'good listeners', i.e., to listen to what, rather than how, your child speaks; 3) recognize and praise all speech progress, regardless of how small, that the child may make in therapy.

Active Role

For those parents who appear as though they may contribute to the therapy process, home speech assignments should be planned. However, to ensure maximum effectiveness of home assignments, the following steps might be followed before the actual assignment is made: 1) the child should be able to perform the assigned task in the therapy room; 2) parents should observe a demonstration of the home exercise, and 3) the specialist should observe the parent's attempt at carrying out the exercise.

Dr. Donald Hess
Professor of Speech Pathology and
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Demonstrations by:

Patricia Conlon
Speech and Hearing Therapist
Lancaster Public Schools

Mrs. Sally Yovetich
Speech and Hearing Therapist
Tonawanda Public Schools

Paula Miller, Senior Student
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State University College at Buffalo

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Speech Pathology and Audiology
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Discussion and Demonstration of Therapy Techniques

Dr. Donald Hess

It is difficult to attempt the sort of task with which we must concern ourselves this morning. Where do we start? Shall we attempt to be comprehensive or representative? Shall we confine the discussion and demonstrations to representative approaches to speech therapy for specific types of speech problems posed by cleft palate persons, or should we delve more broadly and deeply to include problems of motivation, parental counseling, self-concept, etc.?

To insure reasonable structure, we have selected four cases for demonstration which might be considered as representative problems of "cleft palate speech." Because I have a little time to talk before each demonstration, I might resolve some of my ambivalence by discussing briefly some of the persons and some of the types of speech problems encountered over the past 15 years. In the process, we may appreciate a little more the deeply human experience that is implied in referring to speech therapy for cleft palate persons. We may also recognize that there is no single approach to speech therapy that is all-inclusive to cleft palate persons.

I would like to begin with reference to a little 2½-year-old cleft palate youngster. This boy had a certain degree of nasality. Along with some other articulation problems, he was a lateral lisper. He had other quite singular problems. He was definitely showing primary stuttering symptoms, and he was still wearing elbow cuffs that had been fitted at the hospital six weeks previously. You see, he was a thumb sucker, and the doctors did not want to run the risk of his rupturing the sutured palate. When he was discharged from the hospital they had forgotten to remove the elbow cuffs. In the initial therapy contact he stood, straddle-legged, and urinated through his clothing. He had pretty good language, as I found out, because he ducked under a treatment cot and called me a son-of-a-bitch! This sort of behavior was continued for nine months after those elbow cuffs were removed. When he got this out of his system, he became quite amenable to therapy, and the stuttering had disappeared.

I would like to tell you about the 29-year-old woman who was referred to me under circumstances of which I was not fully apprised. As understood, the arrangement involved 30 hours of speech therapy, after which she was scheduled to receive secondary lip surgery, nasal tip repair, and a wire brush procedure for removing a severe facial acne. This gal was motivated, as I've never seen motivation. Nine consonant sounds were cleared up, and her pharyngeal hissing was straightened out. You have never seen such improvement in 30 lessons. In fact, she had improved so much that we were able to skip the speech therapy in the last two sessions and have some time for discussion. I asked her, "Why this extreme need to improve your speech? I've never quite seen this level of motivation." Her reply was, "Well, I didn't want to tell you, but Dr. X told me that if I didn't get over here and get my speech cleared up, I wasn't going to get my nose straightened out, and I wasn't going to get that lip repaired, and I wasn't going to get the acne removed from my face." Well, she had all these things done, and a year later she called me by phone and wanted to know how I felt about her speech. The speech improvement had caved in completely! I don't think she was trying to be hostile. However, there's a lesson for us speech therapists. We've got to know our cases better, and we've got to have better communication with our specialists.

I could go on and describe many cases that illustrate tne point that we need to consider the individual and his individual problems, first and foremost. And in the effort I suppose that we would cover the spectrum of problems that we call "cleft palate speech." But we are not going to have time for this. Rather, we'll consider some representative types of cleft palate problems, and demonstrate them. I wouldn't think of imposing a method of therapy on any cleft palate person, and it goes without saying that we should not have a method of therapy that is tailored exclusively for a type of problem. Ultimately, the therapy must be tailored for an individual. And I hope that our therapy demonstrations will show, to a certain extent at least, where this is planned for in particular cases.

Despite the individual nature of specific cleft palate speech problems, I think it could be said that, if you look over the broad spectrum of problems among a cleft palate population, you could come up with some identifiable subtypes. And these subtype symptoms can give us valuable leads as to how we should plan our therapy. One type of youngster who comes to mind is the one who is fitted with a speech aid. I don't know why tnis comes to mind, perhaps it's because I've worked with so many such children. Here is a child with minimal nasality at most, with perhaps some denasality along with it. Or he may be exclusively denasal. This youngster has what we might call developmental articulation problems. The method of therapy is just about what one would do for any child with articulation problems. Then, there is another child who is essentially normal in articulation, yet possesses hypernasality as a major problem. Here we have the task of restoring oral-nasal resonance balance within the limitations posed by the physical problem. You will view such a problem today. Then we have the problem of gross misarticulation on specific sounds, such as nasal snorting on certain sibilants. We'll see such a child today. Along with these articulation characteristics, she has only minimal nasality. You will also see a child today whose principal problem is nasal emission--air leak during attempted articulation on sounds that otherwise are made well. We see other youngsters who -- and this is practically a type of itself -- have a catch in the back of the throat on plosives, and a hiss in the back of the throat on sibilants, coupled with glottal catches in many cases. The 29-year-old that I referred to earlier had some of these characteristics, but along with them she tended to ram her tongue forward for s and z, and had a lateral lisp on these sounds. As Dr. Bloomer had suggested in his discussion, she was ramming her tongue tip along the line of least resistance. She was a unilateral cleft palate case. We see this type of problem in such cases more than just occasionally. Along with these problems she had a great deal of hypernasality as well.

Well, these are some of the cleft palate subtypes that represent variable problems of misarticulation, nasality, and nasal emission. There may be others. However, there has been no research that clearly defines these subtypes, if they exist, as I think they do. With regard to velopharyngeal valving, Shelton's recent research would seem to suggest that cleft palate individuals are highly different in the manner in which they valve for speaking. You may have read the research report in the last Journal of Speech and Hearing Disorders, or Journal of Speech and Hearing Research, I can't recall. I think it is in the Journal of Speech and Hearing Disorders, and you can read his report on cineradiographic analysis of the velopharyngeal closure shown by these cases during corrected speech. We'll be talking about some of the implications of his research later on.

I think I'll just read on through, and tell you a little about Mike Potacki and then we'll have our demonstration. Mike had a push-back surgical repair. His lip and alveolus are uninvolved. He can get good oral breath pressure, I think, but we'll get him on our manometer here, and see how much sustained, unaided blowing pressure he can achieve. He can also effect controlled articulation of syllables with minimal air pressure, eliminating the nasal leak. He articulates well; as a matter of fact, his problem is that he overarticulates. He produces articulatory contacts so strongly that he has a tendency to get a slight air leak. that makes a very impressive acoustic result. It's loudly distracting. I'll try to illustrate the problem on the chalkboard. As Dr. Bloomer had some of his own symbols, I'll use my own. If he were to say something like "It's 8 o'clock." Mike's problem resides in closing the juncture. He could say, 8 o'clock as well as anybody, but (I'll write this in phonetics if I may) he fails to control valving after the hold phase of the consonant. He comes to the hold. He can't get the release with complete valving in the off-glide of the consonant, and it comes out something like this -- (demonstrate). It is a "growling" vocal snort. Nasality is not represented as a major clinical problem here. You'll note that the volume of his voice is fairly powerful, and vocal inflection is adequate. The speech therapy that you'll see demonstrated will go something like this. This nasal snort was identified for Mike as a growling sound. He proceeded to give it his own name; "No," it's more like a piggy sound." Which tells a lot about Mike, and his sense of humor! Ear training was carried out, to get him to identify it, whenever it occured. You see, Miss Hiller had to imitate this, and gave him ear training in identifying this, so he could proceed to hear it and correct it later. Well, you can guess what followed. Obviously, he was taught to control the production of the consonant vowel, to eliminate it from his speech. And then he got some "faucet therapy", where he was taught to turn it on and turn it off. I defend this highly. These children need this kind of self-monitoring training, and this sense of control. I might add that I have done negative practice, if you want to call it that, with youngsters as young as 4 years of age. Not many of them. But if you can explain it, it's useful, and there's no age limitation to its application. We read in the literature that you use it usually not below the age around 9 or 10, of course, because not many youngsters can understand the purpose of it below that point. There's no reason to use it if they don't understand it, but if they do understand it, it's reasonable to get them to try this "turn it on, turn it off" kind of approach. In order to eliminate this "velar growl", the feeling of closure was enhanced, and Mike was asked to attend to it.

Head positioning was used to encourage velopharyngeal closure. If you tilt your head back, like this, you can get a definite feeling of tightness in the velopharyngeal area. I encourage you to try it sometime with a youngster. This is very similar to the position that prosthodontists use in their muscle-trimming procedures in fitting speech aids. You get the same effect, sometimes, with the tilting of the head to the side, or putting the head down between the knees. I got this idea first from Dr. Milisan in 1951, and from watching Dr. Harkins several years before. I would encourage you to try it. At the same time, in addition to tightening up in the back, Mike was taught to loosen up in the front. This will be clarified in Miss Heller's demonstration. She explained this rather unique, I think. She taught him to think of himself as a ventriloquist. All the tension had to be back where it was hidden, but in the part that could be viewed, it had to be loosened up. You see, he was over producing sounds, he was over pressuring for p, b, t, d, f, and z. He was getting too much contact, putting too much of a demand on the valve, and thus, he was introducing the more disturbing features of his speech, as a result of over attempt. In addition to this, she was able to teach him what Van Riper has called "pullouts." I don't know, maybe there is a better name for it, but what it was, was simply this: when he came up to the hold (the problem was right here, right?) and he could affect a good "t" after this point, but he could not control the tightness of the valve from that point on. At least he wasn't coordinating, and it was a kind of a signal practice, in a sense. He would go up to that point, hold, feel the tension, and then give a signal to Miss Heller that he was ready to try the valving afterwards. And it worked very nicely. He could keep nice velar closure. And if you return, of course, to the Shelton article, you'll see that this is a pretty common problem among cleft palate children. Oh, incidently, no vowel therapy as such is employed, because the vowels are sufficiently clear in quality. This, then, is a special kind of articulatory procedure. The demonstration, as I recall, will involve the "p" and "b" sounds. We'll now have the demonstration of some of the techniques that worked with Mickel Potacki, and Miss Heller will do the demonstration.

(Dr. Hess first measured Mike's unassisted oral pressure on the Hunter oral manometer as 12 ounces per square inch. Reference to the research of Spriestersbach and Powers was made, with specific regard to the degree of oral pressure that they found as differentiating between good velopharyngeal valving and poor velopharyngeal valving. Mike's measure places him above their critical measure, 8 ounces per square inch, and identifies him as a potentially good valver for speech purposes. Miss Heller then demonstrated negative practice with Mike's air leak. She also demonstrated various ways in which it was identified by Mike with her guidance. The demonstration illustrated how negative practice is followed by positive practice in a "faucet therapy" approach. In the process, Miss Heller was able to bring out the fact that Mike might not be optimally motivated for speech improvement, by his own admission. The demonstration showed how Mike could identify over-effort on the various pressure consonant sounds and eliminate much of it.)

We might consider the prognosis for ultimate improvement here. I don't know, but I think the chances are very good for this boy to reach a point pretty closely approximating normal speech, and I feel very strongly that this approach is going to have to be followed fairly systematically right down through the sounds on which he has difficulty. You notice that he was getting this growling velar, incordinative leak on "p" and "b" and he's learned to reduce it on these sounds. Miss Heller had gone on to "t" and "d" and he was beginning to reduce it there. I have a feeling that we must follow this basic approach almost as if we were teaching the sounds for the very first time. Did you notice that something akin to rate control was being done? We've got to learn to slow these youngsters down to insure valving coordination, and I hope that we leave this conference with the thought that rate control work might well be assimilated into our total therapy. I'm not saying that these youngsters are forever imprisoned in a slow or extremely slower speaking voice, but I myself have never had any real success trying to teach new sounds and patterns to cleft palate youngsters, at a rate which we normally would expect in non-cleft palate speech. We have to slow it down to the point where they can manage to control, whether it be a procedure for reducing nasality, coordinating the valving as in Mike's case, or otherwise getting improvement in any other of the dimensions of speech. Then it's our task to gradually increase speaking rate up to the limitations that would represent the child and his capability for handling rate. We have to find the upper limits of rate that are best for him, and this has to be vivified for the child. I think when we do have regression in these cases, we have not done this sufficiently well. And the child too often, after working at a slower speaking rate, leaves our therapy thinking he has to speak in a different - his own - kind of speaking voice and personality outside therapy class. So he's trying to speak fast outside, he speaks slowly in the therapy, and he never marries the two ideas. We've got to effect that kind of reconciliation by providing gradually increased speaking rate, and by appropriate situations to vivify success outside the therapy class.

The next case is Michael. Mike is 15 years of age. His physical speech problem might be described as follows: like the other Mike, this Michael had a cleft of only the soft palate. He had a push-back repair. On preoral viewing (through-the-mouth viewing), one is impressed by a failure to view Michael's throat. That is to say, he tends to present this characteristically humped tongue, that so often characterizes hypernasal cleft palate cases, and, I might say, functionally nasal cases as well. In other words, he's a classic example of the high-riding tongue and limited velarpharyngeal action, originally described by Kaltenborn and later by McDonald and Baker. His soft palate is definitely impaired in terms of motility. He certainly had adequate length. It is one of the longest postoperative repairs I've seen. But, there is not enough lifting and retraction in the palate, and I feel that we are working within certain limitations here. Even with our best efforts, we're still going to have residual nasality. In other words, we're working to reduce nasality here. We are not fooling ourselves one iota. We are not expecting, in this youngster, a complete reduction of the nasality. By and large, his articulation is normal. The consonants are clearly perceptible as phonemes, and as I remember him, he closes juncture properly. You may hear me talk an awful lot about closure of juncture, and I think this is an extremely important procedure in our therapy, where it's necessary. But, in this boy's case, I think he closes it normally. Now, if he presents a problem of nasal emission, it's not perceptible, and it's of no clinical consequence. Therefore, he appears to present moderately severe hypernasality. When he comes down, we'll check his blowing pressure to see how well he can do on that. In the speech therapy, you'll see a demonstration of the type of therapy as originally described by McDonald and Baker in their March 1951 *Journal of Speech and Hearing Disorders* article. It will be vowel therapy. In other words, we'll be attending to the part of his speech that is of clinical consequence, the vowels. The consonant articulation is normal. Although McDonald and Baker decry the importance of complete valving, I personally bemoan the fact that this boy has so little functional valving and we may have limitations within which we work here. On the bulletin board here, you'll see a physiological vowel chart that is taken from Carol and Tiffany's text. We have the front vowels, going from high to low, "ee", "ay", "ae". The back vowels, going from high to low are, "oo", "o", and "ah". Research studies have indicated that even in severely hypernasal cases, you will have your greatest chance for reduction in nasality on the low vowels. As was indicated in the nasal-analog study of House and Stevens, an impedance in the oral cavity tends to cause a greater amount of nasality. Using their analogous model, they could account for the greater degree of nasality on high vowels than on low vowels, and on front vowels than on back vowels. The greater amount of physical impedance that exists in the high vowels represents, in effect, a block to orality due to the high tongue position. It would seem, therefore, that we can offer the child useful information about what nasality-free quality sounds like if we start out with the low vowels. Now, obviously, this is not enough. We have to go further than this. We have to take him up through the higher vowels, but at the same time, try to find the flattest tongue position and the widest mouth opening that can be effected within reasonable physical and cosmetic limits. Using the clearer voice quality on the lower vowels, we try to get reduction in nasality in the higher vowels. By using pairs of vowels, the first vowel sets the pattern of voice quality for the second vowel. Thus we can present pairs of vowels like "ah", and "ae","ae" and "ay", "ah" and "o", and "ae" and "o", "ah" and "ay", etc. After sufficient practice in these vowel pairs, we can teach the child to produce the pair of vowels as a continuous blend. As before, blending practice should initially involve the lowest vowels. By crossing over from the low front vowel to the higher back vowels, and the low back vowels to the higher front vowels, we cover most of the remaining diphthongized elements. If the youngster is extremely nasal on "ae" and"oo", we may avoid practice on these vowels, even for a protracted period of time. We want to build in the child's mind the clearest, most vivid acoustic image of nasality-free speech that is possible. We are fully aware of the fact that he may employ very nasal "ee" and"oo" vowels. For the time being, however, we want his therapy attempts to be successful attempts at clearer voice quality.

At this point we begin practice on "syllable sandwiches" -- combinations of vowels and consonants. As to the consonant that we will use in a child who has no misarticulation of any consequence, I don't think it makes too much difference. There may be merit in doing what McDonald and Baker suggest, using the simple bilabinals, possibly even the voiced sounds first. However, I don't think that this is critical. What is critical is to teach consonant vowel blending and still maintain improved voice quality. We've got to get a good sampling of as many consonants as possible with these various vowels, if we wish to get the kind of pattern of speech that the child can rely upon.

(Miss Conlin's demonstration with Michael followed.) Miss Conlin identified with Michael the reasons why he is so nasal, and the changes in the mouth and throat that are necessary to reduce nasality. Michael characteristically uses a humped tongue, limited jaw movement, and - as will be indicated later - very little of the velar movement of which he is capable. Miss Conlin reviewed the need to get greater velar tension, flatter tongue positioning, and wider mouth opening. Low vowel practice was employed in the mirror to allow Michael to view his attempts to place his tongue forward and down. As he moved to higher vowels, he was encouraged alternately to pinch his nostrils and leave them open, without altering voice quality. When his attempts to tense the velum caused him to get "overflow tension" in the form of a humped tongue, he was cautioned to relax a little and not strain too much.

After isolated vowel practice, practice in vowel blending was carried out. When difficulty was experienced, Miss Conlin encouraged Michael to match the clear voice quality of lower vowels, in his attempts on higher vowels. They then returned to vowel blending practice. There was continual punctuation of this practice with requests for self-evaluation of voice quality and tactile-kinaecthetic mouth and throat sensations. Good humor and fine therapeutic relationship were abundantly evident.

Syllable practice was then done, beginning with "b" and followed by "p", in combination with several vowels. As before, self-evaluation was continually encouraged, and caution against humping of the tongue on vowel articulation were offered. Practice also involved syllable sandwiches with "f" and "v". Michael was encouraged to articulate the consonants with light contacts, and to consentrate on the clear voice quality on the vowel.

From the syllable elements practiced on, sentences and patterns were practiced. By encouraging clarity at the <u>end</u> of each sentence and pattern, dramatic reduction of nasality was effected. Miss Conlin then asked Michael to read, first in his characteristic form of speech, then with a wider mouth opening. Dramatic improvement was evident.

I couldn't possibly presume to compete with the fine system of nonphonemic notation that Dr. Bloomer showed us the other day to indicate the malphones that are so common to cleft palate speech. However, on the board is another system for nonphonemic notation, which I have found useful for my own reference. I mention it to you, for whatever use you might want to make of it. Consider what, we might call, the stable articulators from 1 to 7. On top, going from front to back, we have the lips, teeth, alveolar ridge, hard palate, soft palate, posterior pharyngeal wall, and the glottis, numbered from 1 to 7. Then the moveable articulators similarly numbered, are the lips, lower teeth, tongue tip, tongue blade, tongue back, posterior portion of the tongue, and the glottis. You can thus note by a number system, the point of articulatory focus in a child's attempt to make a sound. If you add to that, then, the symbols like 1 - for lateral, n - for nasal, you come up with just about all the symbols you need for noting the nature of the error, particularily if you indicate, along with this, the sound that's being attempted. Thus in a pharyngeal hiss, if the attempted sound is "s", 6 - 6 indicates, you see, that the posterior tongue is drawn back against the back throat wall, as far as you can judge, and there is a hiss made in that area of constriction. So on down the line. The pharyngeal catch, which might be hard to remember by I P A symbol, becomes fairly simple, 6-6-k, if it happened to occur on the "k" sound. It would be 6-6-t, if it happened on the "t". And it makes it a fairly simple orientation for future reference, particularly in the analysis of consonant sound errors. Consider lateral lisping as another example. If it involves lingual-alveolar contact, and it goes out the left side, you'd have 3-3-1-L, 1 for lateral, 1 for left, you see. The circled 1 indicates the manner of articulation, the other 1 the side of emission of air. It would be 3-2 if it's a lingual-dental contact, 3-2-1 for lateral, L or R depending upon if the sound were emitted left or right. If it went out both sides, you put L R. It becomes a fairly simple way of noting the kinetic nature of errors. I just mention this for your possible consideration. I think we all have to find our own most useful set of diagnostic referents. I feel that there is more then one kind of nasal snort as used by cleft palate speakers. Dr. Bloomer indicated that the lingual-velar posture is the most common one. That may well be, but I've heard youngsters, such as the youngster you will hear today, who have a habitual lingual-alveolar contact, along with a pendant velum, and resultant snorting of air out the nose. This would be indicated by Van Riper and Irwin as a breathy "n". By this system you could show it as 3-3, "n" and "s" attempt. If it were a "t", it would be the same thing, with "t" beside it. So much for that

The next case we will see is a real triumph for her therapist. The child is Rebecca, 9 years old. This child had originally come to Mrs. Yovetich's attention as a child who did not seem to present a problem of cleft palate. There was, however, in her judgement, a palato-pharyngeal insufficiency. The soft palate looked short and the child was somewhat nasal. She very wisely palpated the soft palate and discovered what appeared to be a sub-mucus bony defect. She called this to the attention of Dr. DeFelice, a local surgeon, and a push-back repair was done. A letter dated January 14, 1964, from Dr. DeFelice to Mrs. Yovetich, might merit reading:

"Dear Mrs. Yovetich, I thought you might like a progress report on Rebecca. As you probably know,she was operated at the Buffalo Childrens' Hospital on December 28th, 1964. At that time the push-back type of operation was performed for the sub-mucus cleft of her palate. The itinerated central portion of her velum was exercised, and the muscular was approximated. The entire palate retropositioned by the push-back procedure to give increased length to the palate. Post operatively she has done very well. Her healing is almost complete, although there is some residual swelling of the palate. I would think when the palate has had sufficient time to completely disappear, and after she has had the benefit of continued speech therapy, you will be rewarded to see an improvement in her speech. Please let me know if there are any questions in your mind concerning Rebecca's palatal surgery. Thank you again for referring Rebecca for this reconstructive surgery."

That's the kind of letter we like to see. It shows nice professional contact between a speech therapist and allied specialists. I think it speaks well for the general spirit of cooperation in this area. I don't know what Becky's preoperative speech was really like, since I'd not seen her. Postoperatively, the major problem appears to be misarticulation. Becky had a specific problem of lingal-alveolar contact and nasal snorting on "s" and "z". Interestingly enough, she can make "sh", "ch", zh", and "j". But on these two particular sounds she has this nasal snorting. And this is what we are focusing our attention on at present. There will be some vowel therapy shown as a part of the demonstration. It is not primarily intended to reduce nasality, as such, since this is not a critical problem in her speech, as you will observe. However it does allow sufficient phonetic sampling of consonants and vowels to permit sound strengthening in syllables. I've asked Mrs. Yovetich to demonstrate some of the therapy for strengthening "sh", "ch", and "j", which are there. They are phonemically accurate, but they could be sharpened a little. She will also demonstrate techniques for establishing the "s" sound. When you observe this, please remember that such procedures should be preceded by a great deal of earl training. I can't stress this too much. I think this child, and other cleft palate children, could profit a great deal from evaluating the sound as produced by the therapist and the error as produced by the therapist. The whole acoustic imagery of the sound we wish to teach should be well established before we can expect any consistent production of the sound in the child's speech. If we don't do this, I think we run the risk of a great deal of inconsistency of consonantal articulation. Then we find ourselves wondering, when the youngster was perfectly capable of producing a sound, and produced it in syllables, and produced it in sample words, why he's forgetting it so often. You see, the acoustic imagery is not sufficiently established in such cases. We've got to define the target if we are planning to do target practice. As I recall, Becky got the "s" for the first time by the pinched-nostril technique. She very quickly altered her tongue position by loosening the tongue-tip contact against the alveolar ridge, and got a nice "s". So remember, try bypassing the velving problem to establish sounds. Close off the nose and there's only one place for the air to go, and that's right out through the mouth. Shut off the nasal air escape route by pinching the nostrils and the child must loosen up in the articulatory contact. I think this is what Van Riper had in mind, in part, when he advised loosening anterior articulatory focal points. Of course, it is also possible to loosen an overly contricted tongue position of "s" and "z" where these sounds involve too much nasal air leak. So let us have the demonstration with Becky, after which we'll check her oral blowing pressure.

(Mrs. Yovetich's demonstration consisted of exercises for strengthening the "sh" and "ch" sounds and practice on achieving oral emission of "s". The "sh" and "ch" sounds were practiced in words and sentences.

To encourage looser articulatory posturing for "s", the nostrils were pinched.

I would like to make several comments about the therapy for Becky. They would apply to other youngsters with cleft palate. When the nostrils are pinched to encourage a looser articulatory contact, this should always be followed by a re-attempt of the sound with the nostrils open. Actually the reverse of this was done in the demonstration. The danger here is that we may be encouraging what we really don't want, namely, over-constriction at the lingua-alveolar focus of articulation. When we ask the child to re-attempt the sound with the nostrils unoccluded, we should encourage him to loosen the tongue position while still aiming for a clear and acounstically accurate sound.

I would also like to point out that we shouldn't accept open juncture in our pattern drill. "Yes - I - see" is not enough. We've got to teach the child to blend, and get him to hear the "see" in "yes, I see." Also, I would suggest that we keep these patterns short and functional. Let us not inject redundancy into our therapy. If we say to a youngster, "Do you see the box?" It's natural for the child to say, "Yes, I do." So let's keep our pattern functional and have the child practice the more natural expression. I think we may not get carry-over sometimes, because we are not keeping the pattern functional. Let's go for closure of juncture in the most natural speech form that we can teach. This is one of my complaints about the articulation therapy that is advanced by Dr. McDonald at Penn State. I agree with this man so much that I may be overly fascinated by a point of disagreement. However, I don't think you really accomplish too much in therapy by throwing words like "match-boy" together. They don't make sense to me. But "Yes, I do" makes sense to me. So let's try to be functional and practical in our therapy.

The next young lady, Marie, is one of these bubbling adolescents. She is 13 years of age; Marie has a postoperative complete cleft of the palate, and pre palate, with a bilateral lip movement. She wears a dental prosthesis, and the palatal repair was a push-back procedure. It appears to be a little too short. It's taut, asymmetrical, and it looks as though there may have been some postoperative slipping of the suture at the uvula. This in itself may not be too important, but the tautness and shortness of the palate is very important. The alae of the nose are flared somewhat. The major speech problems are hyper-nasality and nasal emission present in her speech was at least partly caused by overly tight articulatory foci, that is, positions of articulation. And although she was capable of achieving wide mouth openings, even without the aid of a tongue depressor, on oral examination, she did tend to restrict her mouth opening, in speech, so there was some emphasis on this. As I recall, vowel therapy, as such, as not used with Marie, and will not be demonstrated. But I think you'll see some very effective techniques that were employed in her case. Marie may be a candidate for a pharyngeal-flap procedure. I can't tell you right now whether there is good inbulging of the lateral pharyngeal walls, but I would imagine that her present therapist and supervisor will be checking for this. If, after a reasonable period of therapy, there is consideration for a pharyngeal flap, such mesial movement of the lateral throat walls would be a good indication for a pharyngeal-flap procedure. As I recall, because of the high degree of nasality manifested on the high vowels "ee" and "oo", Miss Eichelberger chose to stay away from these vowels during the therapy. You may have noted that the demonstrated vowel practice has not included short vowels. And yet, we have short vowels in speech. This is not, then, a total speech sample, as demonstrated. It's good preliminary work, but it's got to lead, eventually, to the intermediate mid-high and mid-low positions in the front and back vowels. But the reason for choosing the long vowels in early practice is obvious. The child must prolong his vowels sufficiently to get a good evaluation of voice quality. If we feed the stimulus in one ear, and he has this to compare his own effort with, by prolonging the vowel, he gets a much better chance for internal evaluation. It will allow him to scan his production and compare his attempts with the therapist's model. As with Michael, we aimed to lessen the demands on Marie's valving by reducing the oral pressure, by reducing the contact for the sounds. I think what we do here is pretty much intuitive. We sense the degree to which valving can be accomplished, and then we loosen up the position of articulation accordingly. The sounds of "v" and "f" were worked on in this manner and they will be demonstrated. To get Marie to understand the aim of greater velar movement, diagrams of different positions of the soft palate were used as a basis for explanation. Miss Eichelberger also used the nasal manometer, which Marie did not like. I'm not going to impose upon her by asking that it be demonstrated today. However, she was able to reduce the nasal flow of air by watching the instrument during syllable practice. Head positioning also helped to facilitate valving. Incidentally, never ask a child to tilt his head back while phonating a vowel. The vowel will simply become much more nasal. Try it yourself. All you're doing then, is causing the naso-pharynx to become a part of the resonating column, and then you've got nasality. Head positioning is used to get the feeling of velar tightness, which is then applied to the articulation of pressure sounds like "s" and "t". A great deal of use was made of funnels and rubber hosing in Marie's therapy. Remember when Dr. Bloomer mentioned rubber hosing for enhancing self evaluation? This was helpful in Marie's case. The tape recorder also was used with benefit. Then too there was a lot of negative-positive practice work with this youngster for exaggerated contrast, and I think that will be demonstrated as well.

(In her demonstration, Miss Eichelberger alternately demonstrated and explained therapy procedures, including: 1) ear training, 2) pinched nostrils - open nostrils techniques as used in self-evaluation, 3) head positioning, yawning, swallowing, and other methods of increasing velar action, 4) tapping the tongue and soft palate at different points to enhance tactile kinaesthetic sensation, 5) relaxation of articulatory contacts, e.g., on "f" and "v", 6) tape playback, evaluation, and re-recording, 7) mirror practice, 8) teaching wider mouth excursion.)

Dr. ess -- With only a few minutes remaining, I would like to make a couple of points about which I feel strongly. One involves speaking rate. The speaking rate of cleft palate children must be slowed down during the speech building process, whether it involves articulation, voice quality, or both. Many cleft palate children will need to learn habitually slower speaking rates. It would be foolhardy to ask a man on crutches to run a foot race. It makes no more sense to ask a person with a post-operative palate or a speech aid to speak at a fast rate. Even at best, the palate that we are dealing with is motorically and sensorially impaired, particularly if it is post-operative. Teaching a slower rate gives the velum a break both ways: more time to move in a coordinated fashion, and more time to transmit kinaeshetic feedback, thus creating feedback loops that will further enable the child to get proper blending and juncture, and maintain reasonable velar tension and closure. We must remember that of all parameters of speech, speaking rate and variations in it are least likely to be subjected to adverse audience reaction and penalty. So why not make good therapeutic use of this realization? Let's slow down the rate, and provide carry-over activities to insure the use of slower speaking rate outside therapy class.

There is another matter which I would like to discuss, and it involves the procedure of adenoidectomy. Being from Pennsylvania, perhaps I am biased without complete justification. In that state, adenoidectomy for cleft palate patients is considered a most radical procedure. We had hearing losses among our patients, of course. But there are other things besides adenoidectomy that can be used in handling otitis media, aren't there? Antibiotics, politzerization, and myringotomy are several alternative procedures. Perhaps the biggest problem after all, is that of timing. Too often such hearing problems are allowed to develop to the point of chronic complaint before anything is attempted. Is it necessary to employ adenoidectomy as a routine procedure? This seems to be the question. I am aware that Dr. Fahey, who spoke earlier in the workshop pointed out that in his research they could find no significant difference between preadenoidectomy and post-adenoidectomy speech of cleft palate children. I'd like to know more about it. I'd like to know how the study was done. I'd like to know how they made their judgements, and who made them. In addition, I'd like to know the procedure of the adenoidectomy itself. Did it involve a complete removal of the adenoid tissue, or was it a peripheral snipping of tissue in the area of the Eustachian orifice? These matters are critical in their possible influence on the therapy we are carrying out. We have the responsibility of becoming interested and vocal in these things. And I believe the medical specialists will react constructively, if we broach the subject in a constructive way. This whole question is far from being resolved, research-wise, I feel. I have personally known three cases where the speech regressed markedly following adenoidectomy. In all fairness, I must add that there was a dramatic improvement in the hearing of one who had suffered from a moderate conductive loss.

Cooperative Planning for the Child with a Cleft Palate

Chairman: Alby Lutkus

Representing:
Training Centers - Dr. Edward Mysak

Community Agencies - Elmo Knight

School Administrators - Calvin Lauder

Speech Correction - Public Schools - June Clase

Cooperative Planning for the Child with a Cleft Palate: The Role of the Training Institution

Dr. Edward D. Mysak

Because many speech and hearing specialists in school settings express the belief that certain complicated speech problems should not be handled by them, it may be assumed that they are reflecting concepts acquired at certain training institutions, or they feel unprepared, or they feel unable to cope with the problem because of certain limitations imposed by their setting. Whatever the reason for the belief, it does not serve the child with cleft palate speech in the school, and therefore might well be modified.

Training to Practice a Profession vs. Training to Practice a Profession in a Certain Setting

It should be self-evident that training institutions should give primary consideration to training master speech and hearing clinicians, and only secondary consideration ought to be given, in planning a training program, to the setting in which any particular student may want to practice, e.g., school, hospital, rehabilitation center, private office. In these instances, some emphasis in the training program may be placed on orientation to the particular setting, and on the acquisition of special knowledge and skills required to practice most efficiently in this setting.

The School Setting and the Child with the Cleft Palate Speech Syndrome

Since the cleft palate speech syndrome is usually made up of a dysphonia-dyslalia complex, there is no good reason why, in many cases, the trained specialist, who treats both aspects of the complex in school, in non-cleft palate children, cannot work with the cleft palate child. This is especially true if the specialist maintains a close contact with the hospital team which may be responsible for the overall care of the child. Therefore, it behooves all specialists prepared to take on their full professional responsibilities, which may mean working with other than "typical cases", to indicate to the administration their equipment and facility requirements, the time needed for adequate diagnostics, the number of desirable therapy sessions for each student, the maximum case load, etc.

Cooperative Planning for the Child with a Cleft Palate: The Role of Community Agencies

Elmo Knight

Cooperative planning for the child with a cleft palate requires a definition of the roles of the various individuals and agencies offering services to the child and to the family of the child with a cleft palate. Unlike the training center, which functions primarily to prepare speech and hearing professionals, the community agency has as its primary function providing diagnostic and therapeutic services which would not otherwise be available in the community. Further, the services developed by the community center should not delay nor impede programs which could be more effectively developed within the school context. The conviction that hearing, language, and speech habilitative facilities should have their central focus within the pupil personnel services of the primary and secondary school systems stems largely from the following premises: 1) Communication skills are basic to the educational and developmental processes, and eventual individual adjustment is predicated upon the quality of those skills. 2) The relationship of hearing, language, and speech skills to educational and personal adjustment is sufficiently basic to require that special education for communication disabilities be correlated with the general educational program. 3) Primary education and personal adjustment of the exceptional child are most realistically and fruitfully realized when provided within the context of the neighborhood school. That is to say, separation and segregation of the child who has need of special education, which can be provided effectively within the neighborhood school, is tantamount to deferring adjustment demands which will have to be encountered eventually.

Following from these premises, what are the advantages and disadvantages of community center programs for the exceptional child? Similarly, what are the legitimate areas of service to the cleft palate child which may be offered by the community speech and hearing center?

Among the advantages the following might be noted: 1) The Center may be a part of, or be affiliated with, a community hospital or other medical resource. From such a position of medical and dental affiliation, the community center can develop working relationships with a wide variety of specialties. Direct availability of tangent services in the case of the cleft palate child may include: a) Oral surgery, b) Pediatrics, c) Orthodontics, d) Prosthedontics, e) Otolaryngology, f) Speech Pathology, g) Audiology, h) Psychology, and i) Social Service. These many specialties may be provided through the efforts of a highly integrated cleft palate "team", as is the case with the J. Sutton Regan group, or the various services may be provided by referral to special individual clinics within the hospital. 2) A second attractive feature of the community center is its ability to fill a critical need by establishing a preschool program for cleft palate children. Through such a program the child and family may begin work on developing communication skills at a time when many mistakes may be avoided and excellent readiness for the formal school experience may be developed. It is partticularly desirable that the preschool program be offered in close functional approximation to the diagnostic facilities, since the total assessment and broad treatment of the child continues most intensively throughout the preschool period and the kindergarten year. In the preschool program for cleft palate children offered at the Childrens' Hospital Speech and Hearing Clinic, therapy is continued through the kindergarten year. 3) Another advantage of the community speech and hearing center lies in certain of its special diagnostic facilities. Careful audiologic workup requiring special acoustic environments, some degree of special instrumentation, and a degree of professional competence and experience is a service which may not be generally available. Whether we can accept the widely divergent reports of incidence of hearing loss in cleft palate children, ranging from Goetzinger, et al, who reported no significant difference in tendency to develop hearing loss, to Sataloff, who reported an incidence of 90 percent, the consensus appears to indicate an incidence from 35 to 45 percent. Clinical experience in the Buffalo area indicates an incidence of hearing loss among cleft palate children of from 40 to 50 percent (Fahey), while the incidence in the general population of school children is two to three percent. Audiologic diagnostic and rehabilitative services represent a very significant facet of the cleft palate problem, and the community center is uniquely prepared to offer such services.

Disadvantages of the community center have bearing largely on the matter of therapy for the school-aged cleft palate child. Those disadvantages which come to mind are: 1) Transportation of the child to and from the center constitutes a problem, particularly in those instances where the family resides outside the city, or at some distance from the center. If the child attends school, therapy must be scheduled after school hours, when the child is tired and unresponsive; or the child must be released from school, thereby losing out on a portion of time. 2) From a purely financial point of view, providing therapy in a community center may involve expense to the family, an expense for a service which, in my opinion, should be part of the public education to which the child is entitled. 3) Of greater importance is the difficulty of correlating speech, hearing, and language therapy with the child's academic program. Because of poor correlation of therapy with the language activities of the child's school program, opportunities for reinforcement and carryover may be lost. At this point, it should be noted that the work of Spriesterbach, et al, and of Morris, has led to the conclusion that the cleft palate child tends to be retarded in a number of communication skills. As Morris puts it, "Ideally, habilitation programs for the cleft palate child should include techniques for evaluating other aspects of possible deficit, such as language development, and should be prepared to provide relevant therapy." The additional language proglem imposed by the cleft palate child's tendency to develop hearing loss may present language disability of such magnitude that it is impossible to effectively correlate therapy offered in a center with the language activities of the school program. 4) Another, and perhaps the greatest, disadvantage of providing therapy to the school aged cleft palate child through the community center, is the problem stated at the outset of these remarks. That is, provision of services may relieve the school's awaremess of the need for more intensive services within the schools, and, in that sense, may diminish motivation of school boards to provide personnel to offer more meaningful speech, language, and hearing programs.

In summary--, ideally, the community speech and hearing center should function to provide only those services to the cleft palate child which it is uniquely suited to offer, and which cannot be provided more effectively elswhere. The specific conclusions drawn from the foregoing may be stated as follows: 1) Services offered by the community center should be primarily diagnostic. Speech evaluation and audiologic assessment offered in cooperation with the broad cleft palate team can be most effective. 2) Those therapeutic services which are offered should be for the preschool child, and for the school-aged child only in special cases or during the summer vacation. 3) Greater emphasis should be given to speech, language, and hearing programs within the school, particularly for children who suffer organic disorders, such as cleft palate and hearing loss. The implications of such a statement are rather broad. First, there is implied a need for greater attention to organic disorders, and to language problems in the training programs which prepare the school therapist. Secondly, there is implied the need for more faithful representation of the speech and hearing discipline by the school therapist. Too often, an impossible caseload causes the public school therapist to compromise the needs of the child with an organic communication problem. Without greater preparation in the organic areas, faithful adherence to that training, and forthright presentation of sound clinical practices, the school therapist will continue to be plagued by too large claseloads, and too little time to offer effective therapy for the organic problem, including the child with a cleft palate. 4) Finally, by whatever means one may devise, there is need for a concerted effort to educate boards of education, and the public in general, to recognize the need and provide adequate funds for employing speech and hearing therapists in sufficient numbers to provide support in the neighborhood school for the child who suffers an organic communication problem. Each of us bears a responsibility to participate in such an effort.

Cooperative Planning for the Child with a Cleft Palate: The Role of School Administrators

Calvin Lauder

Our superintendent tells the story about the task of education to prepare our children for the technological age ahead - how much we must prepare children, and the advances that need be made in instruction. He ties this in with the story about attending a workshop on the use of machines and computers in education. This workshop happened to be in one of the large metropolitan areas, where a 30 story building housed a school on the first 3 levels. On the remaining floors it housed business offices. A group of educators had been attending this workshop and were coming down in the elevator. It stopped on the second floor and a very, very attractive, vivacious teacher - obviously she must have been a speech and hearing therapist - got on the elevator but before they reached the first floor, this very charming girl screamed, "OUCH"!! "Somebody pinched me!" and one of the superintendents very quickly and without hesitation said, "Thank God, there's still something being done by hand." And so it's been during these last three days. As you have participated in a very concentrated workshop, you've actually been digging by hand, and I suspect you will continue , with the nature of the problems that you face as you move through the schools to uniquely utilize the information and materials you have gathered. This of course, has been the purpose of this institute.

My assignment this afternoon is to present some observations from the point of view of a school administrator and the role that he plays in the programming of the cleft palate child. Of course, I'm talking about, and for, those individuals who are pretty totally responsible for the educational programming; to establish a framework to facilitate planning, working, evaluating, interpreting, and modifying programs. Too, he has the responsibility to program remedially and instructually for pupils having unique needs - specifically the cleft palate child. Actually, I guess you could refer to this as one of <u>expectations</u>. Expectations of the speech and hearing therapist, expectations of the community, and of course, the expectations of the school administrator. I might suggest, however, here, a note of warning. We must not allow the specific cleft condition to bring about a gap in a total habilitation program. Such a program must include the assessment of abilities, adequate educational-instructional programming, the well being of the individual, the mental health of the student. It must include vocational preparation, the theraputic program, which you're most interested in. I think that I might be suggesting that we want to move with caution as we focus minute attention on the cleft palate without considering the child within a total environment. Obviously, the success of any instructional program for children is primarily dependent upon that particular individual and the instructor, in this instance the speech and hearing therapist. However, there is a prerequisite that is obvious, and regardless of the size of the staff, whether it be in a metropolitan area or in a small community, it is necessary that the therapist and the administrator maintain a continuous circular chain of communication and understanding regarding the speech and hearing program. Particularly, as we consider the more severely organically involved pupil. Unless one has actually had the opportunity or experience in moving, let's say from the classroom, through supervision and through an administrative job, I think it's extremely difficult to understand why such a vital area, which is of such and interest to you, so often does not receive the priority that you feel it should receive. Unless you have had these experiences, I think it's difficult to recognize the administrator has to consider the overall programming of the child, and develop some framework of reference as to what priority programs receive. One must recognize that there are varying pressures from communities, from state departments, and other agencies. I think most school administrators recognize that about eight percent of the pupils in their schools have a need for some sort of speech and hearing program. I think Mr. Knight has beautifully outlined the advantages and included the disadvantages of public school and private programming for these children. I think it's well recognized that the public schools are quite an appropriate setting for remediation programs, as more and more specialists are added to the school staff.

As we think of expectations further, the community expects, and should have, quality service in the speech and hearing area. This necessitates that the school administrator employ well trained, qualified, competent, and certified teachers of the speech and hearing handicapped.

It is the expectation of the administrator that these individuals be knowledgeable and con contribute in an educational program. As Dr. Mysak has indicated, the same personnel available to private agencies, hospitals, clinics, are the same individuals that are employed by the school systems. I would submit that the administrator in a school is responsible, together with the speech and hearing staff, in developing guidelines of operation. Here the therapist must take the initiative in informing the administrator as to the selectivity of problems, screening ages, numbers in a therapy program, the need for coordination time, how his time can best be utilized, the need for individual therapy or instruction, and too, to establish priorities for scheduling organically based problems. Developed guidelines, too, should allow a minimum of a misunderstanding on the part of the school supervisors, teachers, parents, and children, that allows the therapist the opportunity, and freedom, and flexibility of eclectic therapeutic practices. Guidelines should indicate and place the responsibility for the program on the therapist. Respect for the integrity of the individual should be the core of a therapist-child centered program. Integrity is essential of the individual in the utilization of modern dynamic learning opportunities, and learning theories, or the essence of program success, between child-therapist, therapist-parent, therapist and other professionals, including the administrator. These guidelines need be well defined.

In Rochester, we have found that the speech and hearing therapist is paramount in the liaison between the community, the community agencies, and the schools, as they follow directly and participate in the diagnostic clinic. I think one of the errors that is so often made, in certain communities, is to have a speech pathologist or the hospital staff speech pathologist on the team, rather than including onthe team, the individual, which may very well be a public school speech and hearing therapist, on the initial diagnostic team. This allows and brings about closer communication and follow-up, because in the end this person is following this child more totally, and need bring back to the diagnostic team, for evaluation and as a re-referral possibility for review. We are fortunate, of course, in having the Subtelny team, Strong Memorial Center, and the Eastman Dental Dispensary, in Rochester, where we are able to have rather than the administrator of a program or the staff speech pathologist, the public school therapist in the diagnostic work-up. I don't think the therapist can place the total responsibility for certain lags that have been suggested this afternoon upon the school administrator. What I'm suggesting is the need for certain dynamics, if we are really interested in the field of speech and hearing. I believe it is the responsibility of a therapist to take some initiative in suggesting in-service programs for parents, in-service programs for teachers and administrators. Quite frankly, as you move from the instructional base, and the further you get from the base of instruction in the public schools, the less directly involved and the less knowledgeable your administrator is. So there must, and need be, some way to inform the administrator as to the need for programming. I think too, public school therapists must recognize limitations, and with professional integrity must recommend the best program for a particular child. I'm suggesting that the best program be available through the kind of personal relationships with administrators in public schools. So I'm saying, that the therapist must have the opportunity to present, and should offer the best of service; but yet recognize the limitations within the framework in which they're asked to work. This might suggest that the therapist may want to refer a particular child to a community agency, particularly in those school districts that do not allows, or have adequate services, which limits the child to be seen in therapy once a week for a 15 minute period.

As we think of the needs of children, I think it's our professional responsibility for the therapist to determine whether this child is in need of intensive, concentrated, longitudinal therapy, which can or cannot be given in the school setting as the program exists.

One thing we have done in Rochester, and has been well received by our new inexperienced therapists, is having what we refer to as speech staffings. Here we specifically have presented the kinds of problem cases presented by an individual therapist, going through the diagnostic procedure, review, planning, developing as a group the kinds of things that need to be recommended for a particular pupil. This not only adds insight, but it develops evaluative facility. In Rochester we see from 20 to 25 cleft palates a year. But I would be concerned about the child who has been dismissed as corrected, or not in any need for further therapy, without some procedures being built in for periodic review, particularly near the adolescent age. I'm sure that this has been reviewed for you during the last several days. The need for recheck, periodic re-referral and evaluation as this individual grows and as the speech apparatus varies and develops is obvious. One of the problems facing a school administrator is actually fighting for the dollar for particular programs. It boils down so often to budget, and since State aid no longer is available for the physically handicapped child, there's a decreasing incentive in public schools and by school individuals for special programming. So I must suggest that program growth be based on demonstrated needs and gains. The administrator, quite frankly, is interested in the gains that can be demonstrated in therapy. He must rely on periodic speech and hearing reports. This is the feedback of value to the administrator in determining if a program is gainful. An administrator is interested in a dollar output-productivity relationship. I think, as a professional group, therapists certainly need to recognize this. So I'm suggesting the recordings, the records that are requested, are necessary, and as I have suggested, they are part of the feedback to determine productivity, effectiveness, weakness of program, strengths of therapists, and overall specific program needs. Actually, such an evaluation is not unlike the clinical observations in diagnostic teaching that are utilized in therapeutic programs. I think we, too, should be conscious of educational trends that are taking place in other areas of educational instruction. The therapists should be cognizant of current and new practices in an educational setting, so that the speech and hearing therapists as a group do not contribute to a potential lag. Program learning is a good example. I'm not suggesting that program learning may be what we want to utilize, but I might suggest that the micro-leveling of materials and understandings may be the concept that we may want to study and think about as we move along in our therapy. Actually, the identification of small steps of learning, and how to present information and materials is what program learning does. I would like to suggest that we think, as we think therapeutically, of the micro-leveling concept involved in program learning. I'm looking forward, too, to the modern school district, which assigns a group of teachers and experts to 140 or 150 pupils, who will have the total responsibility for education programming and management. I see built in here, if the therapist is part of this programming group, the opportunity for concentrated assistance, if it is needed longitudinal assistance, if it is needed. I also see built in what is so lacking in so many programs, and that is, flexibility potential. The therapist should be aware of sources of financial aid. Actually the administrator acts as the resource person in determining what is available, and outlining what may be available to families through the bureau of medical rehabilitation, health departments, community agencies or DVR. In Rochester, we still use the court order procedure, but it's the responsibility of the County Health Officer, to followup and recommend to and through the State levels. I would like to suggest that the relationship of the therapist and the school administrator, and those individuals responsible for other community services, need be a cooperative one and cannot be antagonistic. There is no room, really, for professional jealousy when we are attempting to foster and present the kind of program which best suits the childs needs, and particularly the student with exceptionality. It's our responsibility to bring this individual to the functioning level of which he is capable, and have his peers and the public be accepting of him. These are the responsibilities of both the school administrator and the speech and hearing therapist.

Cooperative Planning for the Child with a Cleft Palate
The Role of the Public Schools
June Clase

I don't have any answers for us. I have some feelings I'd like to share with you. I have some questions that I ask myself. I thought you might share this thinking aloud with me. Mr. Lutkus suggested that I organize my thinking around four or five points, and I have done just this.

The first: What kind of information do I find essential in planning a program for a youngster with a cleft palate? The more I thought about this, the less I knew about it, really. I know lots of things about some children, and I know very little about some other children, and these two things are not always related to the progress I'm making with them. I like the kind of information that comes from experience, from working with them, if it comes to a good foundation. Aside from this, I would like any of the medical information that is available. I like to know what the original cleft was like, a description of it, the ages at which the surgery was done. An assessment of the success of the surgery is useful, how adequate do these structures appear to be; certainly the future plans. I would, of course, want as assessment of the child's hearing, of the child's general health. Much of this tells me how far this youngster has gone before I met him. It's also nice to have supporting opinions. This is an alone game, and I don't think any of us are quite so self-assured that we think we have the answers, so it's nice to know someone elses thinking. Especially the beginning clinician, and for many others of us, this is important, for we don't have a great deal of clinical experience with large numbers of these children. Our impressions are somewhat limited. If we have seen only four children with cleft palates, then we can't have too many clinical judgments, we don't have many hunches on which to operate. These come from experience; we develop them as we work with children, and then we begin to ask more intelligent questions of other people. We begin to seek information more intelligently. When we first start with these children, we have to take it right out of a book. We're cook book therapists. Later, we begin to develop our individual approaches; this comes only with experience. If we have this information, we can be realistic in the kinds of goals we're going to establish with the child. He may not want these, but at least we think we could go with him, if he were willing to go with us. In a sense, some of these things aren't always related to his progress. We all know children who have less capability, but their motivation is so great they do well. It depends on what ticks inside of the youngster.

Educationally, the kinds of information that I like to know: I find that this comes after I've worked with the youngster. For some children I don't collect a great deal of information. If they're learning, and the learning seems to be, and this is subjective, at a rate that satisfies me, I collect relatively little data. If he is not progressing, I want to find out why. Does he work at his grade level? Perhaps I'm not communicating with him well, maybe I'm overestimating his capacities to manipulate language, to get the ideas from me. I would want to know about his general adjustment. What is he like in the classroom? What's his social development like? Is he an immature child? If I sense these things, then I would like to have reinforcement, or is this behavior just with me, or does this seem to be typical of the child in general? This, I think, is a part of this ongoing process of diagnosis. Really, I don't think we can know what a youngster is like until we've started to work with him, and he has demonstrated his limitations. Then we have to begin to ask questions; why don't we get beyond this point? I would want to know, too, the family's adjustment to this problem. How well have they learned to live with it? Are they creating problems? Are they helping him solve the problem he faces? In addition, I would like to have a better definition of a speech defect. I know we operate on the Van Riper one - speech that's so different it calls attention to itself - but I want to know how different is this difference? Who hears it? Me? The child's family? A critical listener? Who else is hearing the difference? I think this is the key thing. This is perhaps my personal prejudice, but I think it really depends upon who is hearing it. If the people in his environment aren't hearing it, then I don't think we need to worry about it. But, I haven't solved it, in terms of how I find out who's hearing it. I count noses sometimes, and I go around collecting information, but I don't know how effective this is. Morley suggests that with a cleft palate case we should work with a youngster until his speech is not different to the trained listener. This is a high standard. I might like it for myself, or if it were my youngster, I might operate on this, but I don't know that I can impose this kind of standard on the children that I met in the school. It doesn't eliminate the subjective nature of the decision; trained listeners don't always hear the same things.

The second major area: What kind of an organizational procedure works best: group, individual, or mixture of the two. I have a personal prejudice for individual because I can tailor-make the therapy procedure to fit this youngster. I don't have to broaden it to include the needs of many children; it can be very intensive, if only one person is with me. Yet, on the other hand, I recognize there are some real values in group therapy, the psychological and emotional support that comes, the give and take. The peer group is sometimes a far better teacher than I am. I'm sure when I talk to a group oriented therapist, I'm in that camp, and the next day if I talk to one who is individually oriented, I'm in that camp. I straddle the fence beautifully. I suppose I take the safe way out, do both, so I can get the advantages each of these approaches. Probably though, we have to decide which of these forms we're going to do in terms of the limitations in which we work: the number of schools, especially if they are widely separated, and the size of the population we're serving. We have to look at how much ground do we have to cover, and then do the best that we can in that situation, at least for the time being. All of life is a compromise between what we would like to do, our ideals, and reality. Life is rather practical; we have to say, this is what we would like to do, but we compromise in terms of this ideal, and what we can do in this situation. I have a hunch that it isn't the organization really, but the quality of therapy that the youngster receives in the long run that counts for the most.

Another major area, I have found personally, to be a real problem, is the liaison between the speech correction teacher, administrative staff, and classroom teacher. Maybe it's me. I seem to be having more trouble with this than many other therapists. It has not been with administrators that I have this difficulty. I have it mostly with teachers. I have not found teachers, as a group, as particularly interested in doing anything to help with the speech development of children. I think it may well stem from fear; they don't know what to do, and this is a very legitimate kind of fear. Too often I find dis-interest; this is your job, do it, don't bother me with it, I have enough things to do. Teachers have a readiness too, I guess. Perhaps I haven't done those things that prepare a teacher for readiness, to make her receptive to the kinds of information she needs to know, in order to work well with the youngster. So, I am sneaky about this. I've decided that we can't go to people and hope to tell them anything. Over our coffee break, or at lunch time, I drop little tid-bits of information. We have fascinating information that's quite foreign to teachers, you know. I drop a little tid-bit to get them interested, and lo and behold next they're asking questions. I'm always eager to share the little I know with them, and so I do. Quite frequently, this works, and finally we get down to the case at hand - to the youngster in her room. Soon she asks me, and I think this is really the secret. We can't tell them, they must ask us. We can offer to share pertinent information then, in terms of offering to do some special thing for her, to get materials for her, anything that might be meaningful to her. It's the same educational theory; we can say children must have a purpose for learning, but you know we are, in a sense, teachers to the teachers, and we try to give them much information that doesn't have any real meaning for them. We're not being very good teachers; we've got to motivate them. They have the need for the information that we might be able to share with them. And I use this word "share" with real concern, because I think it is a shared thing. She has information that we need, and we need a great deal of it. I think we've got to remember this isn't a one way street in which I can say, "I am responsible for his speech, therfore, I tell you what must be done." It doesn't work that way at all. We all have information, we have to pool it, and together come up with something that will be an advantage to the child, that will help him to learn.

As for reports to administrative staff, I think we first ought to ask ourselves: What kind of information do they want? If you will tell me what kind of information will be of most use to you, then I will be glad to get this ready for you. This is a very easy thing although it doesn't lend itself to forms. We can't ditto out 575 forms and say, "Ah! Now I'm set for the next 10 years." Not all administrators want the same information, so let's see what is wanted, for what purpose is it to be used, then make it out accordingly. Personal contact with teachers, with principals, and with the superintendent of the school is best. Nothing on a piece of paper carries the same meaning as does talking. We need to know each other and as you know, who reads the stuff what gets in the mailboxes? It's something more to look over. So talk with everyone who is involved with the youngster, the school nurse, the administrator, the principal, the teacher, the parent. We must also listen. First of all we listen; when we find out what it is they would like to know, or we become aware of problems they're faced with, at that point we might talk about approaches which would be useful and helpful. We ought also to be working with the parents: listening to them, sharing information with them when we can.

I think these parents have such a real problem. I don't think we can generalize because many people have inner resources, many of them don't; some have much insight and some don't. So again, let's listen; soon we will discover the ways that we can help. Listen, because the parent isn't interested only in this hole in the mouth; Johnny does other things too that are disturbing. Mother wants to tell us about this, and about Susie, the little girl in the family, and the big brother who has problems, and hubby who does something else. It's very comforting to find that there is someone who cares enough to listen. After she gets rid of all these things, then she might be more receptive to what can I do now for Johnny's speech: What would you suggest? I think we might as well save our breath until parents ask for help. They don't particularly want to listen. They may think they want to know, but they want to talk. They have things to get off their chest. Let's be listeners.

When can we do this? Staff conferences. My personal prejudices are showing again, for these sound great on paper, but I've never been involved in one that seems to work well. A coordinating day? I don't find that this works either because I need to see Miss Jones, who's free at 9 o'clock on Tuesday, and then I also need to see Miss Smith, who's free Wednesday afternoon at 2:30. The people I would like to see aren't always free at the same time I've decided is my coordinating time. However this does work for me. It's on a catch-as-can basis. True, it means that I can't schedule myself in so tightly. Certain routine things come up regularly, so I leave a little time before I have to leave the buildings, so I can pop in to see the principal or the nurse. The rest of the day is scheduled with classes. This week I had 10 phone calls, 3 conferences and 5 letters to write, but next week I won't have any of these things to do. What will I do with my coordinating half-day? What works best for the individual therapist is obviously the thing that counts. For me, if I have to schedule a conference, I call to determine when the person would be free to come. Perhaps this conflicts with a class, so for that one week I won't meet with the group. A note to the teacher, I'm sorry but today I can't meet with Johnny and Susie, takes care of that problem. In the long run, I find this evens out, and that I have used more effectively the total time I have. Otherwise, I find the people I want to see can not come during my conference time. Because I didn't lug with me the stuff I might have needed to do something else, I find I'm not using this time effectively. This way, if I need the time, I've got it. If I don't, I can meet with the children. I throw this out, take it for what it's worth.

What are the major problem areas? Time! And I won't say any more about this. Experience! No matter how much we've had we all feel we want more. Securing parental help! I find it's difficult to get. Let's be cautious, though, of what we ask the teachers and parents to do. We talk about the whole child, we see him in terms of total environment, but we forget about the whole parent, the whole teacher. They have other responsibilities. Let's face it, we are a bit prejudiced about Johnny's speech. This does take on an importance for us which they may not share. Let's not burden them with things. Let's admit that it's difficult to remember whether Johnny has pronounced his "t"and "k" right, when the important thing at the moment is - has he given the right answer. Attention is most often focused on something else. The teacher is listening for other things. She has other responsibilities with this child, so let's be realistic in what we ask her to do.

The next major problem is the aloneness. It's frustrating not to have anyone to worry with, to share our concerns and our frustrations, to support us.

Certain problems can arise in therapy with some children simply because it's carried on in a school environment. Some children have very negative feelings about school, about teachers, about everything that's concerned with school. If they have those feelings, they bring them to speech class with them. They're going to feel about you, and about me, as they do about teachers in general. Anything we suggest they do is connected with school. If they have a negative attitude, we're going to get that same negative attitude. They may enjoy coming to speech class, but it's because it gets them out of the classroom, and they would rather be with us than in Social Studies. There may be open rebellion or there may be just a subtle lack of cooperation. They enjoy our company, and I think, sometimes, that's all it is. They're not really about to do very much because after all, this is just some more stuff they do in school. And really, I suppose we have to face it, schools aren't known for their concern that what the child feels is important. We're rather notorious in schools for; you're here to learn, and I'm here to teach you, so learn!

Summary

Alby Lutkus

I would like to share with you a few of the notes I have taken during the three-day conference. From the presentations and comments made it is apparent that we fall into two general categories of service--those "who hurt" and those "who comfort." The dentist, the otologist, the plastic surgeon, the orthodontist, the prosthodontist, who appear early in the life of the cleft palate child will be associated with drilling, hospitalization, dentures, opturators, anestheria, and medicine and thus are those "who hurt." The speech correctionist is in the second category. He is likely to be friendly to the child and less threatening. He belongs in the same group with the parent, the teacher, and the school psychologist, and therefore will have a better rapport with the child.

The services provided by the dentist, the otologist, the orthodontist, and prosthodontist, will prove to be, for all practical purposes, inconsequential unless the child is helped to acquire usable speech. We must give this careful thought. It is your responsibility to help satisfy this need and possibly you become the most important person on this team because the purpose of all of this habilitation is to give the child usable speech. The speech correctionist must often take the initiative in a public school program, or little will be accomplished. I think many of us have found this to be true. The speech correctionist is a clearing house for all the medical and educational information and must be able to sort out what is useful and valuable in planning a speech correction program. She also has the responsibility to help change attitudes, particularly the attitude of rejection among classroom teachers because the child has a severe speech handicap. We have to change this attitude from rejection to one of acceptance, and this is accomplished through a long process of education. We must also educate parents to love their children more freely. It is not unlikely that many teachers feel because the child has such an apparent physical deformity, that he is also mentally retarded. Such an attitude obviously must be changed. The speech correctionist in the schools must learn to work cooperatively with all existing agencies, but not allow the agency to replace his efforts, but rather, to provide supplementary help. It was pointed out during this conference that there are many disciplines involved, each discipline playing an indispensable role in the speech welfare of the child. The speech correctionist must be tenacious in her efforts to get information that will aid in understanding more fully the speech needs of the child with a cleft palate. She must be cognizant of the fact that therapy will require long-term planning. Cleft palate speech will not be eliminated in one semester, or in one year. In all probability, the child will be receiving some form of speech correction throughout his entire school life. So in our planning we must think of a long period of time. As Dr. Bloomer very avidly pointed out --"too often, too many speech people give up too soon in working with the cleft palate child." We must learn to be tenacious, and "stick with it." If one technique does not work, there are many, many others we can try.