CLINIC FOR SPECIAL CHILDREN NEWSLETTER

VOLUME I NUMBER 3 * LANCASTER COUNTY, PENNSYLVANIA * SPRING, 1992

PLANTING ROOTS

The Clinic for Special Children opened its new doors on a sunny day last June to welcome and serve families in the Lancaster area whose children suffer from glutaric aciduria, maple syrup urine disease and more than a dozen other inherited disorders. The celebration resembled a family reunion for those who were drawn together to build the clinic through volunteer time, effort, contribution and encouragement. Dr. Holmes Morton dedicated the building saying the hard work of the clinic is just beginning. The passage from the Bible read by Maggie Allen in German, translated, *from suffering comes understanding* reminded us of the special challenge of the clinic.

The support and interest in the clinic from so many in the Lancaster area and from all over the country has been heartwarming to the families who come to the clinic, encouraging to Holmes Morton, the clinic's founder, director and only physician, to the staff and board members. It will continue to make a difference in the lives of many children and their families. We are very grateful to all who have been a part of making the clinic possible and bringing hope where it was needed. Just three years ago we had our first gathering in an Amish kitchen to talk about what could be done to help children with glutaric aciduria. Although we knew somehow the clinic would get started, little did we realize the extent of the help we would receive and the concern from so many. It has been inspiring, at times overwhelming, but we always feel blessed with the means to do work which needs to be done. **Thank you to each of you who has made this possible.**

Photographs by Jim Stansbury

As part of the dedication and celebration we planted fruit trees along the lane to the clinic. These young trees were planted for each of the families whose struggles with glutaric aciduria or maple syrup urine disease inspired the work that led to the new clinic. As the roots of these trees were taking hold and flourishing, so was the clinic. Now that the new building is complete our work is focused toward full development of the clinic's services. It has been an extremely busy and challenging winter. There is much progress to report.

ROOTS IN THE COMMUNITY: THE AUCTION

A highlight of the fall was an auction held on September 28th to benefit the clinic. Several parents who bring their children to the clinic on a regular basis were aware that our operating funds were low and decided to sponsor an auction. Friends and neighbors, asked to donate or make goods, brought an astonishing array of items for the auction, including over a hundred beautiful hand made quilts, furniture, toys, crafts, baked goods, farm tools and supplies, and two pigs! Several fathers barbequed chicken all day, (actually fifty cases of chicken!) subs, ham and cheese sanwiches, fresh strawberry pie, soft pretzels, home made root beer and ice cream also were sold. Several thousand Mennonites, Amish, and other folk from the local comunity came out to support the clinic and made it as much a day of celebration as a day of sale. Among the items auctioned was a lovely quilt made by a Mennonite woman who is the grandmother of one child and the great grandmother of another who have maple syrup urine disease. The quilt, now an antique, was one of the first quilts she made as a young girl. It had never been used. She said she had been saving it for a special purpose all these years. Her thoughtfulness and generosity to the clinic is very much appreciated as is the thoughtfulness and generosity of the buyer. While sharing the last strawberry pie, the parents counted the day's proceeds: the auction brought nearly $78,000 to support the clinic's operating fund! We are truly grateful to these parents and to all those who participated in the auction. In addition to the much needed financial support, those involved with the clinic will never forget the encouragement and support received from so many in the community. We were truly overwhelmed. With this support from the community the clinic will be able to continue the newborn screening for glutaric aciduria for all Amish infants at low cost to families and keep our fees as low as possible

for treatment of children with GA, maple syrup urine disease and the sixteen or so other disorders treated at the clinic. Since office fees cover only about 40% of our operating costs, the funds from the auction were a great help.

Special thanks to the auction organizers, Mr. and Mrs. Leonard Hurst, Mr. and Mrs. Enos Hoover, Mr. and Mrs. Harvey Hoover, Mr. and Mrs. Ernest Zimmerman, Mr. and Mrs. John Fisher, Mr. and Mrs. Jacob Zook, Mr. and Mrs. Steve Huyard, Mr. John M. Stoltzfus, Mr. and Mrs. Steve Beiler, Mr. and Mrs. Daniel Stoltzfus, Mr. Ralph Atkinson, and Rebecca Huyard for their time, effort, and dedication to the clinic.

There is some discussion this might become an annual event. We will keep you posted on any plans.

ROOTS FOR RESEARCH

CLINIC SPONSORS FIRST GLUTARIC ACIDURIA CONFERENCE

On March 11, 1992, the clinic sponsored the first national conference on glutaric aciduria. Dr. Holmes Morton led the conference along with Dr. Richard Kelley of the Kennedy Krieger Institute in Baltimore. Those attending the conference were physicians, from this country and Canada involved in diagnosing or treating children with glutaric aciduria- type 1. The round table conference gave participants a unique opportunity to compare notes on clinical observations, current research, and variations in approaches to diagnosis and treatment. Until recently, many considered the disorder untreatable. Children diagnosed suffered severe neurological disability usually labeled as cerebral palsy and their disease often progressed to early death. Experiences and clinical insights into GA1 over the past two years at the clinic provided important evidence that this is a treatable disorder and that ill effects often can be prevented. Topics of discussion included:

Natural History & Neurological Syndrome of GA1
Biochemical Basis of the Disorder
Management of Acute Metabolic Illness
Diagnosis of the Asymptomatic Neonate
Dietary Management
Care of Brain Injured Infants and Children

Most of the Amish families with children with glutaric aciduria also participated in the conference during an informal evening session at one of their farms. The session gave parents an opportunity to discuss their experience and insights with the disorder with the other physicians. Attending the conference were Dr. Michael Johnston, Dr. Richard Kelley and Dr. Alex Hoon from Kennedy Krieger Institute and Johns Hopkins, Baltimore; Dr. Vivian Shih, Massachusetts General Hospital and Dr. Matt Warmen from Children's Hospital, Boston; Dr. Edwin Naylor, Magee Women's Hospital and Dr. Ira Bergman, Children's Hospital, Pittsburgh; Dr. Steve Kahler and Dr. Johan Van Hove, Duke Medical Center, North Carolina; Dr. Stephen Goodman, University of Colorado, Denver; Dr. Lane Rutledge, Birmingham, Alabama; Dr. Steve Yannicelli, Ross Laboratories, Ohio; and Dr. Lorne Seargeant and Dr. James Haworth, Winnipeg, Manitoba, Canada; Dr. Iraj Rezvani, St. Christopher's Hospital, Philadelphia and Dr. Charles A. Stanley, Children's Hospital of Philadelphia and Janet Lydon of the PA Department of Health. In sponsoring this conference Dr. Morton and clinic staff hope that the care of children here and elsewhere will be improved by combined efforts to understand and treat glutaric aciduria.

DR. MORTON'S OVERVIEW

Glutaric aciduria has a complex natural history. Most infants with the disorder have head circumferences larger than normal, decreased muscle tone, and, sit and walk alone a month or two later than average. These features do not predict poor outcome. The four Amish children with the disorder who have remained well have all had these features during infancy. Neurological disability is typically limited to poor control of movements and tone. Even in the more disabled children intellect, memory, receptive language, and personality are little affected. In our patients severe injuries occured between 2 and 36 months of age with an average age of 10 months. After age 4-6 years patients remain remarkably stable. Illnesses, which in infancy are associated with severe metabolic imbalances and brain injury, are well tolerated by older patients.

The most striking feature of glutaric aciduria is that severe, irreversible brain injury evolves suddenly. In less than 2 hours during an acute illness, infants who were normal can lose the ability to sit, walk, suck and swallow, speak. and lose all control of their legs and arms. In 15 of 17 Amish patients, parents can give the day and hour of injury. In 13 of 15 cases the injury was provoked by common childhood infections such as chicken pox, ear infections, diarrheas, and ordinary colds. In 2 cases the injury occured in association with fever after immunizations. **Efforts to prevent the brain injury caused by glutaric aciduria must focus upon prevention of injury during these acute illnesses.**

The Clinic for Special Children is unique in its efforts to diagnose infants before irreversible brain damage has occured. The Clinic is the only center that routinely tests asymptomatic newborns for the disorder. Over the past 2 years more than 1300 Amish infants have been tested, five new cases have been found (1/260 tested). Two other cases were diagnosed because of acute illness in infants 2 and 16 months of age. With the help of local health care providers and the Amish community we currently test more than 90% of Amish neonates in Lancaster County.

The Clinic is also unique in its efforts to understand and treat the biochemical abnormalities underlying the acute illness. Of the medical centers represented at the conference we were the only clinic that routinely combines primary care and hospital based treatment for patients with GA1 and the only center to routinely measure blood and urine concentrations of glutaric acid to assess metabolic control during illnesses. In the past 15 months there have been 150 clinic visits and 22 hospitalizations for management of acute illnesses in patients with glutaric aciduria. More than 500 analyses of blood and urine levels of glutaric acid have been done at the clinic to study the effects of illness and therapy upon metabolic control. Clinical and laboratory observations have provided better methods for diagnosis, insight into the effects of dietary protein and kidney excretion upon blood levels of glutarate, and information about the association of increases in blood concentration of glutarate with early and late stages ofintoxication.

Although during 19 hospitalizations blood glutarate levels were controlled and patients did not show progression of metabolic illness or neurological injury, 3 infants in the past year have been hospitalized after the onset of signs of brain injury and did not fully recover despite rapid reductions in blood glutaric acid concentrations. Once the injury advances so far, destruction of the basal ganglia continues regardless of current therapy. The next stage of our efforts to prevent the injury will involve efforts to improve assessment of infants at home by development of a formal assessment system that will include a scoring system for protein, lysine,

calorie & fluid intake, fever, length of illness, urine pH, ketones and concentration. Dr. Kelley with help from a chemist at DuPont hopes to develop a simple urine test that can be done by parents at home that will detect the increases in the urine glutarate concentration which is the earliest sign of poor metabolic control in our patients. We also are working with Dr. Michael Johnston at the Kennedy Krieger Institute to develop treatment protocols aimed at blocking the destructive process in the basal ganglia by the use of medications that antagonize excitatory neurotransmitters, block oxygen mediated injury, and slow the influx of calcium into injured cells.

Children help cut the ribbon to the new clinic

RESEARCH ENDOWMENT FUND

The Clinic has established a Research Endowment Fund as a means to finance research and clinical investigation of the broad range of inherited disorders seen at the clinic.
The number of children with glutaric aciduria, maple syrup urine disease, and Crigler Najjar Syndrome in our region represents one of the highest concentrations of each of these diseases known throughout the world. Other disorders found with high frequency in the Lancaster Amish and Mennonite communities are 3-methylcrotonylglycinuria, Ellis van Creveld dwarfism, and an aldosterone deficiency. There are more than ten other inherited disorders that afflict Amish and Mennonite children. Although a few of these diseases have been studied, information in medical literature regarding treatment is insufficient for many. In some instances such as glutaric aciduria, the disorder was not considered treatable by many physicians and the effects preventable until Dr. Morton began his work in Lancaster County. There is much to learn about this family of disorders and many answerable questions. The clinic is designed not only to provide care, but also to study and improve care and adjust treatment daily, even hourly if needed. This capability affords a unique opportunity to provide effective treatment and to change the severe course of many of these diseases. Our model of a rural medical and research center targeted to meet specific local health care needs may provide useful information for other communities.

Although the research is specifically related to the diseases of children treated by the clinic, particularly glutaric aciduria and maple syrup urine disease, the information derived through this service will have application for the treatment of any child with complex needs due to biochemical injuries to the brain and nervous system that present as neuro-muscular diseases. Among the Amish glutaric aciduria is the cause of at least 50% of the cases labeled as cerebral palsy. Study of glutaric aciduria and other metabolic disorders may provide important clues to understand a cause and treatment of cerebral palsy, sudden infant death syndrome, Parkinson's disease, and Huntington's Chorea. All may be associated with biochemical brain damage due to metabolic disorders similar to the disorders treated at the clinic.

The goal of the endowment fund over the next five years is to raise 1.5 million through major gifts. Interest from this amount should adequately fund most of the clinic's research activity on a continuous basis.
Until the fund grows to a supporting level through its yield of interest, we will continue to rely on donations and foundation support for the research effort.

SEEDS FOR BETTER CARE

The number of Old Order Amish newborn infants in the Lancaster area tested for glutaric aciduria and several other metabolic disorders has grown to an average of 94%. Some months we have tested 100% and since June we have tested over 635 Amish infants. Nationally, as a result of an article that appeared in July's Reader's Digest, the clinic was consulted on nearly 50 cases similar to glutaric aciduria. Twelve cases of glutaric aciduria were confirmed and plans for treatment were coordinated with local physicians in various states. Six of the nine new cases of maple syrup urine disease this year in Pennsylvania were diagnosed by Dr. Morton at the clinic

Although the caseload of the clinic is not high in number compared to most pediatric practices, the intensity of care required for children with chronic disorders is extremely demanding. As a rule, for every child seen in the office, aproximately two hours of followup and lab time for each are required. The caseload of the clinic has been so demanding we have decided to begin a search for another physician to work with Dr. Morton. We are looking for a pediatrician or a family specialist, who is interested in the care of chronically ill children and metabolic disorders, who likes to make house calls at all hours, and who can appreciate the special culture of the families served by the clinic.

COLLABORATION BETWEEN CLINIC AND KENNEDY KRIEGER INSTITUTE

Dr. Michael Johnston, Vice President of the Kennedy Krieger Institute and Professor of Neurology at Johns Hopkins is evaluating the cause and treatment of dystonia (movement disorder) in the older children followed by the clinic who have suffered significant disability in hand movement, walking, speech, and specific kinds of dystonia. Nearly all of these children are intellectually intact, some very bright. Improving function through metabolic control and medication is our goal and this information will certainly be useful on a broader scale.

Treatment of movement disorders (cerebral palsy) in older children who suffered brain damage before the infant testing and follow-up treatment was available, along with understanding the mechanism by which damage occurred and to what specific part of the brain is an area of research directly related to both the immediate care needs of local patients and the broader scope of seeking insight into other biochemical brain injury diseases. Lancaster General Hospital is collaborating with the Clinic to provide MRI Studies of the brain injured children to help assess the relationship between specific forms of movement disorders and selective injury to regions of the basal ganglia.

Dr. Alex Hoon also of The Kennedy Krieger Institute is assessing developmental progress of the clinic's children who have suffered little or no brain damage in order to detect early signs of damage or to help predict outcome in children at high risk for cerebral palsy. This assessment was developed at the Kennedy Krieger Institute.

CLINIC PARTICIPATES WITH CDC IN STUDY OF RUBELLA

Many Amish children and adults in Lancaster County have never been immunized. During the last year there was a significant number of Rubella cases including many pregnant mothers. In an effort to gain helpful information the clinic participated in a study with the Center for Disease Control (CDC) and the State Health Department to test babies exposed to rubella and assess the condition of those born with rubella syndrome. Rubella babies can suffer from a broad range of problems including deafness, blindness, heart defects, retardation, and many other serious chronic problems. We hope information about the devastating effects of rubella will emphasize the importance and value of immunizations. The clinic offers immunizations and follow-up service for families with vaccines provided by Lancaster General Hospital.

LECTURE SERIES PLANNED

The clinic is planning to host a series of lectures with Dr. Morton on research and treatment of the different disorders at the clinic. These sessions will be held for area doctors, nurses, certified nurse midwives, therapists, parents and others involved or interested in the care of children with inherited metabolic diseases to review diagnostic information and approaches to care. The first meeting in this series is planned for May and will focus on Maple Syrup Urine Disease.

THE CLINIC FOR SPECIAL CHILDREN, INC.
P.O. BOX 128
STRASBURG, PENNSYLVANIA 17579

TREATMENT ROOM SET UP WITH HELP FROM PRESBYTERIAN CHURCHES

By the time the new building was completed the clinic had acquired most of the equipment it needed through donations with the exception of equipment and supplies needed for in-office emergency treatment including short-term I V therapy to stabilize children in metabolic crisis. Three Presbyterian churches helped provide equipment for the treatment room. The Beckley Presbyterian Church in West Virginia where both Holmes and Caroline Morton grew up, Wayne Presbyterian Church in Wayne, PA, and the Paoli Presbyterian Church in Paoli, PA, provided support for this essential need of the clinic. We thank the congregations of each of these churches for sharing their gifts through faith.

VOLLEYBALL TOURNAMENT

Philip and Deborah Good blazed a trail of support by organizing a volleyball tournament to raise funds for the clinic. Their church, local community and many area businesses sponsored teams for the all day event near Pottstown, PA. Several hundred came out to participate and the support the clinic received was terrific. Special thanks to the Good's, their family and church, to Dave Shalaway of Bechtelsville who helped organize the tournament and to the many enthusiastic participants and sponsors. We thank you!

GREETING CARDS: The Clinic still has greeting cards for sale featuring photographs by Bill Coleman. The cards come in a set of 8 size 5x7. Cost is $10.00 plus .60 tax in PA. 80% of the cost goes to the clinic operating fund. Please contact the clinic to order.

The Clinic for Special Children is a non-profit diagnostic and primary medical service for children with inherited metabolic disorders in Lancaster County, Pennsylvania. The clinic serves Amish and Mennonite families who suffer from a high incidence of genetic diseases such as glutaric aciduria and maple syrup urine disease. Clinic services include an infant testing program for early diagnosis, primary medical care to prevent devastating effects of metabolic diseases during common childhood illnesses, and clinical research to improve treatment. The clinic is a registered charitable organization in Pennsylvania funded through fees for services and private donations. Our 501(c)(3) tax exempt I D number is 23-2555373.