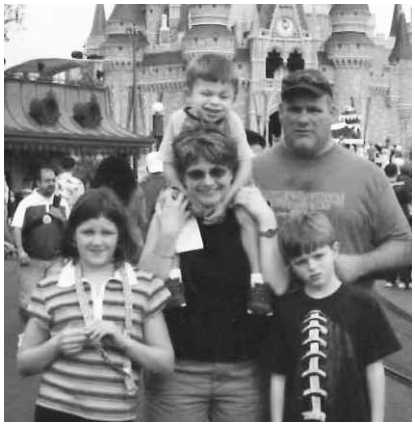
National MPS Society Marks 35th Anniversary with Magic Moments from Disney World

Annual family conference at Disney World shares information, strengthens relationships

MPS families from around the world came together Dec. 17–20 at Walt Disney World's Coronado Springs Resort to attend the annual family conference and to celebrate the Society's 35th anniversary. More than 650 attendees took advantage of this wonderful opportunity to build new and strengthen existing MPS friendships, and to hear insightful information on a wide range of MPS-related topics from leading researchers.

Thanks to Roger Chapin, there were Disney characters on hand Thursday evening to kick off the event. Great photo opportunities, musical entertainment by West Steiner, balloon hats, face painting, and anniversary cake and cupcakes with the Society's signature purple frosting rounded out the celebration. Ryan and Erica Manthy from Pure 7 Studios in Destin, FL, photographed families, giving each family a commemorative Disney photo.

During the syndrome breakout sessions families became reacquainted and met many new families attending the conference. Terri Walden and her volunteers entertained the children during these sessions in childcare with Disney movies, a visit from therapeutic dogs and a fun activity making pillows. Susan Chapin arranged for childcare volunteers and entertainment on Friday, including a visit from the Orlando Magic Basketball "Stuff" mascot; Kyle the DJ, courtesy of the Kefauver family; clowns, courtesy of the Fess family; Ronald McDonald, courtesy of Ronald McDonald House; and storyteller Tom and Mr. Richard, singing children's songs.



Lantham family

The conference ended with a moving remembrance ceremony with music provided by West Steiner and a prayer by Guy Walden while everyone blew bubbles. Families had the weekend to explore the Disney parks.

The conference centered around informative presentations given by experts. Following is a recap of these presentations.

Overview and Management

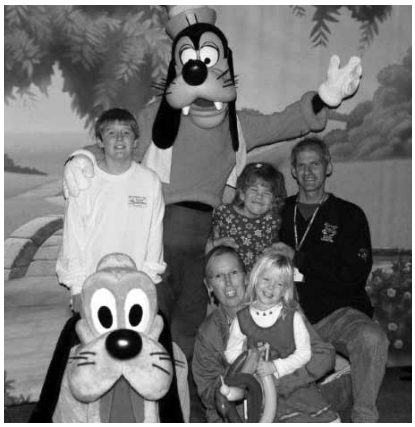
Joseph Muenzer, MD, PhD, professor of Pediatrics, University of North Carolina at Chapel Hill, discussed each MPS disorder, along with the clinical features presented, diagnosis and management issues highlighted for each disorder.

Management Issues

Dr. Muenzer also conducted an interactive session that allowed patients and parents to present challenging clinical problems, such as "when to shunt for hydrocephalus" and "when should a feeding tube be placed," followed by discussions on ways of managing these problems.

Creative Fundraising in a Challenging Climate

National MPS Society Fundraising Committee Chair Steve Holland, along with Terri Klein, development director, illustrated the support available to families interested in hosting a fundraiser. MPS parents Stephanie Bozarth, Steve and Jennifer Clarke, and Eric and Vicki Merrell discussed their events, providing inspirational ideas based on their experiences.



Clarke family

Policy with Partners

Austin Noll, member of the National MPS Society Legislative Committee and board of directors, focused on the Society's political efforts, including what the Legislative Committee does to effect changes in federal policy and to increase National Institutes of Health funding for MPS and other lysosomal diseases.

Treatment and Research Updates

Mark Sands, PhD, Washington University, Division of Bone Marrow Transplantation and Stem Cell

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Biology, St. Louis, MO, discussed how research into the MPS disorders has progressed rapidly over the last decade. There are now a number of protein-, small molecule-, cell- and gene-based therapies that have demonstrated efficacy in both small and large animal models of MPS. Research on protein-based therapies, more commonly referred to as enzyme replacement therapy (ERT), is progressing. Not only are additional forms of MPS being examined as targets for ERT but different routes of administration also are being tested. In addition, the enzymes themselves are being modified to target different tissues including bone and brain. Small molecule drugs are being developed that can either stabilize or simply increase expression of enzymes with specific mutations. Other small molecule drugs are being developed that can decrease production of the molecules that accumulate and thereby slow the progression of the disease. A number of cell-based therapies are being explored using different sources of stem cells such as hematopoietic, neuronal and mesenchymal. Gene therapy strategies also are being developed and modified to increase the level and distribution of the deficient enzymes. This is being accomplished by modifying the gene transfer vectors and the enzymes that are expressed from the vectors.

Dorothy Mask and Tyler Sowden (MPS III)

Terri Klein and Kraig Klenke (MPS II)

Karina (MPS III) and Anyssa Guajardo

Recent studies also are showing that combining these novel therapies that target different aspects of disease can greatly increase the efficacy of any single therapeutic approach. Virtually all of the approaches above are being used clinically either as FDA-approved drugs (ERT) or in clinical trials in MPS or closely related disorders. ERT is already available for several of the MPS disorders and is being tested in several others. Small molecule drugs that target different aspects of disease (protein instability, premature stop signals, substrate reduction, etc.) also are in clinical trials for several disorders. Although brain-directed, neuronal stem cell-based therapies have not been performed in children with MPS, this type of clinical trial has been performed in children with a related disease (Infantile Batten disease). A brain-directed gene therapy clinical trial for MPS III B is scheduled to start in Europe in the spring of 2010. A hematopoietic-directed gene therapy clinical trial recently was performed in children with a related disease (Adrenoleukodystrophy).

Adolescence and MPS

Kendra J. Bjoraker, PhD, LP, Division of Pediatric Clinical Neuroscience, University of Minnesota Medical School, explained that due to medical advances, more adolescents are leading productive lives despite experiencing a rare disorder. Many face complex cognitive, physical, and psychological challenges during adolescence and during the transition into adulthood. Given the variability and broad spectrum of clinical symptoms within MPS disorders, this presentation addressed general issues that adolescents with MPS may experience during this developmental period. Issues such as developing independence, transition from adolescence to adulthood, body image issues and emotional/psychological issues. The presentation provided a better understanding of adolescents with a diagnosis of MPS, offered recommendations, and generated a discussion by parents and adolescents about which determinants of quality of life warrant further educational support and clinical research.

Living with Loss

Michael Campbell, PhD, LCSW, Nemours Children's Clinic, Orlando, FL, led an interactive discussion on grief and loss and ways families can cope with loss. Dr. Campbell began the discussion by pointing out that MPS impacts the typical development for families and their children. MPS families do not follow the normal stages of development that other families follow, which often leads to uncertainty, fear and isolation. The normal stages of family development are: young adult/newly married, birth of first child, transition years, empty nest and widowhood. MPS alters these normal stages forcing families to create their own path to follow. Families dealing with MPS and other life-threatening illnesses must adapt to their situation and seek the support of family and friends who embrace their situation. Parents shared their stories with one another. There was both laughter and tears.

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Connecting with other MPS families who share the same challenges provides families with a network of support they may not otherwise have available. The MPS family conferences, CYCLE conferences, regional social gatherings, fundraising events, and the MPS forum all offer opportunities for MPS families to connect and form lifelong bonds with other families facing the same daily struggles.

Palliative Care

Harriet Miller, PhD, ARNP, Advanced Practice Nursing and Research, Orlando Health, discussed why palliative is sometimes referred to as "comfort care," designed to provide supportive and dignified care for your child and family. The focus of care has shifted away from intensive efforts to cure, to intensive efforts to provide comfort and relief from suffering. In some cases it may help you to plan for a peaceful and natural death for your child. What you can do for your child and support were discussed.

Dr. Miller began her session explaining that palliative care teams are fairly new. Hospitals may have had a palliative care nurse or hospice, but palliative care teams that are patient focused and family centered have only been developed within the last five years. A child who has been diagnosed with a serious illness or life-threatening disease can begin receiving assistance from the palliative care team as early as diagnosis, regardless of their life expectancy. The goal of this team is to assist the family in providing the best quality of life possible for your child, and to provide complete physical, emotional, social and spiritual support for the entire family to enhance their capacity to cope with the life-threatening condition.

To obtain this goal the palliative care team will:

- work closely with you and your child's primary care team to develop a treatment/ care plan that best fits your family's desires and assist you in implementing the plan.
- assist you in obtaining services through your healthcare provider.
- assist families in locating resources in their own community.
- provide the family with counseling services.
- help families transition to hospice care.
- advise families about bereavement resources when appropriate.

Reproductive Issues

Stacie Rosenthal, MS, CGC, began her presentation by explaining that chromosomes are like chapters in a book, and genes are like sentences in a chapter. Mutations are like misspelled words or the disruption of a sentence; there are all different kinds of mutations. Genes are our body's blueprint and instructions. They produce proteins that determine how we grow, develop and function chemically. Humans have approximately 25,000–30,000 genes, which always come in pairs—one from the mother and one from the father. These genes are made of DNA.

Teagan Pevler (MPS I)

With the exception of MPS II which is an X-linked inherited disease, all MPS diseases are autosomal recessive. Although both parents are carriers of the defective gene, the one normal copy of the gene allows the carrier parents to be symptom free.

Any child born of carrier parents has a three in four chance of having at least one normal gene and therefore no disease. Each child also has a one in four chance of inheriting the defective gene from both parents and being affected with an MPS disease. There is a two in three chance unaffected brothers and sisters will be carriers of the gene.

Luke (MPS III) and Juan Valdez

Ms. Rosenthal explained that MPS II is an X-linked inheritance. That is, the mutated gene is located on the X chromosome. Males are most commonly affected; females are rarely affected but may be carriers of the gene. Females who carry the gene have a 50 percent chance of passing the gene to their sons with each pregnancy. If an affected male has children, ALL of his daughters are obligate carriers and none of his sons will be carriers or affected.

Maddy (MPS I) and Craig Wigglesworth

It was explained that DNA testing looks for the specific mutations that cause the gene to not function correctly, while enzyme testing measures the amount of enzyme being made. DNA analysis is the preferred method for prenatal

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testing due to its accuracy. It is important to have DNA analysis done on the affected individual as it can be very useful for other family members. Ideally DNA analysis should be done prior to pregnancy.

Initial DNA testing may take four to six weeks and can cost $900–$4,000. Insurance may or may not cover DNA analysis and in most cases Medicaid is not accepted by specialty labs doing this testing. Other reproductive options include sperm/egg donation from a non-carrier family member or from a bank, adoption and DNA banking.

There are three types of prenatal diagnosis:

- Chorionic Villus Sampling during the first trimester, involves inserting a small catheter to obtain placental tissue to do DNA analysis. Risks include a 1 to 1½ percent chance of pregnancy loss and infections.
- Amniocentesis, performed during the second trimester is done by removing a small amount of amniotic fluid. It provides diagnosis of chromosome abnormality or genetic conditions.
- Pre-implantation genetic diagnosis (PMGD) tests a fertilized egg for a genetic condition, and only unaffected embryos are then implanted into the uterus.

PMGD requires knowledge of the mutation causing MPS and in vitro fertilization (IVF) must be used. The cost is $7,000–$20,000 for IVF and $5,000–$10,000 for pre-implantation testing; usually not covered by insurance.

Multiple cycles may be needed to get pregnant; there is a 40–50 percent chance of getting pregnant with each cycle depending on maternal age. Prenatal diagnosis by CVS or amniocentesis is recommended.

Ms. Rosenthal also discussed ethics regarding these procedures, such as storage of "extra" unaffected blastocysts and discarding of affected embryos.

Austin and Austin IV (MPS III) Noll

Olivia, Emma and Julia (MPS III) Dopheide

Amber, Eric and Sean (MPS I) Merrell

Jennifer (MPS I) and Jill (MPS I) Underwood