

Physician's Update

July 2005

Home Hemodialysis: *Keeping Kids Out of the Hospital*

Children's Mercy Hospital is once again leading the way in treatment for kidney disease. Children's Mercy is one of only two pediatric centers in the nation selected to test new home hemodialysis equipment that promises patients more effective and efficient treatment.

In collaboration with the University of Texas, Children's Mercy will soon be evaluating new technology that has previously been tested on adults, but has never before been studied with children.

"Home hemodialysis offers patients with kidney failure the ability to receive a very effective treatment every day without having to leave home. We believe that this approach to dialysis will not only improve the health of the children, but will have a positive impact on the quality of life of the patients and their families," says Bradley A. Warady, MD, director of Dialysis and Nephrology section chief at Children's Mercy, and professor of pediatrics, UMKC.

'Home hemodialysis offers patients with kidney failure the ability to receive a very effective treatment every day without having to leave home.'

In hemodialysis, a dialysis machine and a special filter (called an artificial kidney, or a dialyzer), are used to clean the blood in patients who have kidney failure. While most hemodialysis machines are rather bulky, require connection to a water source and are best suited to the hospital environment, the new home hemodialysis machine has several

improvements that make it suitable for home use:

- It's lighter in weight (weighing 70 pounds, the size of a TV) than a standard machine, making it easier for families to move it at home.



Jessica McCafferty, home hemodialysis patient.



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News Briefs

Kudos and Congrats

Kudos to the **Children's Mercy Hospital Laboratory** on being awarded accreditation by the Commission on Laboratory Accreditation of the College of American Pathologists.

Congratulations to **Bradley Warady, MD**, Nephrology section chief and director of

Dialysis and Transplantation, for receiving the prestigious chair award from the National Kidney Foundation affiliate of Kansas and Western Missouri. Dr. Warady was also the 2004 recipient of the Children's Mercy Carol Belt Advocacy Award, which recognized his contributions to the National Kidney Foundation and other community groups.

Plastic Surgery Update

Due to an increased referral of patients with large/pre-mature closure of anterior fontanels and Microcephaly, the Craniofacial and Plastic Surgery team would like to recommend specific treatment guidelines and helpful diagnostic tools for these conditions.

Anterior Fontanel

The diagnosis of an abnormal fontanel is dependent on interpretation of the wide variability of normal. At birth, there normally are six fontanels. The average anterior fontanel is 2.1 cm (normal range 0.6-3.6cm) and the median time of closure is 13.8 months. At 3 months of age, the anterior fontanel is closed in 1% of infants; which increases to 38% at 12 months and 96% by 24 months. In pre-term infants, the anterior fontanel is usually larger than in full-term infants at birth; but by 3 months of age there is no significant difference between the AGA pre-term infants and full term infants.

Anterior fontanels tend to close earlier in boys than girls, and black infants usually have larger fontanels (1.4-4.7cm). Fontanel closure that occurs as early as 3 months of age can be within normal limits, but should always be carefully monitored by using the growth curve for head circumference regularly. While performing a physical exam on the patient it is important to palpate the fontanel in upright and supine positions in a calm infant. Craniosynostosis and Microcephaly can be associated with small fontanel or early closure and should be considered in the evaluation. CT scan is usually not recommended unless craniosynostosis is suspected. Plain skull films are not helpful.

A large anterior fontanel or delayed closure should be evaluated for increased intracranial pressure (hydrocephalus, meningitis, trauma, intracranial hemorrhage) as well as chromosomal abnormalities such as Trisomy 21 or Aperts Syndrome. Also consider achondroplasia, congenital hypothyroidism, prematurity or IUGR as the more common causes for delayed closure.

Microcephaly

Growth of the cranium is triggered by brain growth. With the exception of the metopic suture, the sutures remain open until brain growth ceases. Therefore, abnormal brain development can result in Microcephaly.

Microcephaly can be present at birth or develop in the first year of life. It is most often caused by genetic abnormalities that alter growth of the cerebral cortex. Microcephaly can occur alone or in association with other health problems, and may occur from inheritance of an autosomal recessive or rarely, from autosomal dominant inheritance.

In the workup of this diagnosis, consider chromosomal defects (may need to see genetic counselor), congenital infections, exposure to substances/chemicals (fetal alcohol syndrome), Trisomy 21, neurometabolic syndromes, hypoxic/ischemic injury (trauma) or a normal genetic variation.

This diagnosis should be followed closely with serial head circumference measurements and evaluation of milestone development at regular intervals. An MRI may be needed to help in diagnosis.

Currently there are no treatments for Microcephaly. Treatments are focused on developmental delays by providing physical, occupational or speech therapy to help maximize function. For specific symptoms such as seizures, hyperactivity, or neuromuscular symptoms, medications may be considered. Some children will have mild disability or normal intelligence.

We hope that you find this information useful in early management of infants with these conditions. We look forward to hearing your comments or concerns.

*Virender Singhal, MD
Section Chief
Plastic, Craniofacial and Reconstructive Surgery
Associate Professor of Plastic Surgery, UMKC*

Hemodialysis **continued from page 1**

- It uses prepared bags of fluid rather than water and does not require attachment to a home's plumbing system.

- Families can be taught to safely use it at home during a four-week training session.

Home hemodialysis also has scheduling advantages compared to the home peritoneal dialysis treatment and hospital hemodialysis, two other approaches to dialysis care.

Children receiving peritoneal dialysis are typically connected to a dialysis machine 8-10 hours every night at home, while those who receive hospital hemodialysis are required to come to the hospital three times a week for sessions that last four hours each. This creates difficulties for kids arranging school or work schedules. On the other hand, the new home hemodialysis machine makes it possible to conduct dialysis at home only two and a half to three hours per day, at a time convenient to the patient and family.

While home hemodialysis provides patients with more flexibility, a regular schedule is still important to treatment. The treatment must be mutually agreed upon by the physician and patient, with all the treatment results closely monitored. In addition, this form of therapy isn't best for everyone, another important issue that requires discussion between patients, families and their physician.

"We are committed to research and finding ways to improve not only the medical aspects of care, but the quality of life for our patients with kidney disease," says Dr. Warady. "The promise of this new technology is that in addition to being effective, it gives more freedom to the patient and goes a long way towards letting kids on dialysis, just be kids again."



New Doctors

Mary Moffatt, MD
Emergency Medicine
(816) 234-3665



Medical Degree: Royal College of Surgeons in Ireland Medical School, Dublin, Ireland, 1998

Residency: Pediatrics, Cleveland Clinic Foundation, Division of Pediatrics, Cleveland, Ohio

Fellowship: Emergency Medicine, Children's Mercy Hospital, Kansas City, MO

Certification: American Board of Pediatrics, 2002

Angela Turpin, MD
Endocrinology
(816) 234-3781



Medical Degree: University of Missouri-Kansas City, 1999

Residency: Pediatrics, Children's Mercy Hospital, Kansas City, MO

Fellowship: Pediatric Endocrinology, Children's Mercy Hospital, Kansas City, MO

Certification: Pediatrics, 2002

Lisa Castro, MD
Neonatology
(816) 234-3591



Medical Degree: University of Missouri-Columbia, 1996

Residency: Pediatrics, Children's Mercy Hospital, Kansas City, MO

Fellowship: Neonatology, Children's Mercy Hospital, Kansas City, Mo.

Healthy Kids Near You

Kids and parents have lots of questions, and we do our best to answer them.

That's why we started Healthy Kids University, a new community education service that offers classes to help answer

common questions and issues related to raising safer, healthier children.

Healthy Kids University classes are offered at Children's Mercy Hospital and soon will be available at many Greater Kansas City YMCA locations. If you know a group of at least eight adults or children interested in one of our topics, we'll even bring our Healthy Kids University presentation to them.

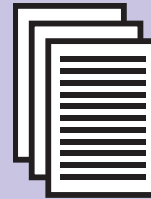
Visit our Web site at www.childrens-mercy.org/hku to see the most current class schedule and class topics.

Healthy Kids University is brought to you by Children's Mercy with support from Kohl's Department Stores. For more information, call (816) 234-3848.



Promote Healthy Habits

Healthy Kids University is sponsoring a Healthy Habits poster contest to encourage kids to be healthy and safe. Poster entry forms are available at Children's Mercy locations, Kohl's department stores, Greater Kansas City YMCA locations and on the Children's Mercy Internet site at www.childrens-mercy.org/hku.



Physician's Update is produced monthly by Community Relations and Physician Services. For more information, contact Shawn Arni, (816) 346-1371 or e-mail to sarni@cmh.edu.

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