

SOUTHWESTERN NEWS

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HELMETS USED TO MOLD INFANTS' SKULLS

DALLAS - July 5, 1994 - Mention helmets, and most people think of sports helmets, like the kind football players wear. But for a small group of parents, The University of Texas Southwestern Medical Center has added a whole new meaning to helmets.

Faculty members in Southwestern Allied Health Sciences School's Prosthetics and Orthotics Program now are working with the Center for Craniofacial Reconstruction, a joint program of UT Southwestern and Children's Medical Center of Dallas, to provide cranial molding helmets for infants.

The orthotic devices are made of a semi-flexible, transparent plastic and are used to maintain post-surgical head shape or even to prevent surgery by passively molding a child's asymmetric head into a more symmetrical shape. The craniofacial program, one of the nation's largest, treats approximately 511 children each year, 166 of whom have cranial deformities. More than 40 of these patients have been fitted for helmets in the past year.

"Molding helmets have become an integral part of our treatment of children with severe cranial abnormalities," said Dr. Craig Hobar, assistant professor of plastic surgery at UT Southwestern Medical School and chief of pediatric plastic and craniofacial surgery at Children's Medical Center. One recent patient was Max Wilson, then 3 1/2 months old. "Max was born five weeks early; and when he started growing, I noticed that the right side of his head was protruding more than the left," said Gail Wilson, his mother.

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To the relief of Max's parents, tests determined that his problem could be treated with a molding helmet and physical therapy. "Although we were thankful that he didn't have to have surgery, we were concerned about his wearing a helmet at first," she said. "I had never even seen one before or heard of it being used for this purpose."

A variety of conditions can result in misshapen skulls. Plagiocephaly describes cases such as Max's, in which the flattening usually results from birth canal pressure; premature birth, in which the skull is more pliable; congenital torticollis, which is a tightening of the neck muscles; or positioning of the infant's head against a mattress or firm surface for a long period of time.

Most babies are born with several different bone plates connected by joints called sutures, Hobar said. These sutures allow the skull to expand as the baby grows in order to accommodate the brain. Premature fusion of one or more of the sutures of the skull can cause the head to be misshapen and to prevent the brain from growing properly.

While heads misshapen for reasons other than suture fusion usually can be corrected without surgery, treatment of suture fusion often involves cranial vault remodeling surgery, during which the cranium is removed and fit back together in a more symmetrical shape. Most of the patients have surgery between the ages of 6 months and a year, when their skulls are pliable. The cranial molding helmets are used after surgery to help maintain the surgical correction. Sometimes, the helmet even prevents the need for secondary surgery, Hobar said.

Helmets usually are worn for three months to a year depending on the

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severity of the problem and the child's age when treatment begins. The devices are fabricated from a plaster impression taken of the child's head. Before taking a mold of the patient's head, the patient's head and body are covered with a thin, stretchy cotton-knit stocking, with an opening for the face. The child is held, usually by his or her mother, while markings are placed on the head to serve as a guide and strips of plaster are laid across the patient's head. Holes are drilled into the completed helmet for ventilation and Velcro closures are added to the back.

The infant's reaction varies from shrieking to napping, said Rob Kistenberg, a certified prosthetist and the primary molding helmet specialist for the Southwestern Allied Health Sciences School. "Nappers are definitely preferred."

When the child's head grows and it is time to move to the next helmet, the entire process, which takes approximately 3 1/2 hours from casting to completion, is repeated. The children usually adjust rapidly to wearing the helmet and generally tolerate it well, Kistenberg said.

Initially, the child wears the helmet for two hours and goes without it for two hours. The helmet eventually is worn for 23 1/2 hours a day, removed only for bath time.

Positive results are evident from photographs and parental observation, but UT Southwestern researchers now are working to develop an objective means for measuring the effectiveness of the cranial molding helmets using magnetic resonance imaging of an infant's head before and after treatment.

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NOTE: Photos of Max in his helmet are available upon request.