Constraint-induced movement therapy (CIMT) is a “common sense” therapy for children with hemiparesis who have the potential for increasing their ability to use the affected upper extremity. It focuses on creating improved awareness and motor skills on the weaker side by limiting the use of the stronger arm with a constraining device, usually a cast, coupled with an intensive course of therapy. Repetitive, increasingly difficult tasks are employed through a process called “shaping” to encourage dexterity, speed, and strength of the involved hand or arm. Following the constraining phase of the program, bimanual therapy is instituted to teach the child to use both arms in two-handed tasks.

The rehabilitation team at Kennedy Krieger Institute recognized the importance of CIMT 11 years ago when the concept was first being expanded from adults to children. The team decided to develop an evidence-based clinical program that includes clinical research. Over the years, the Institute’s CIMT experts have authored numerous articles in peer-reviewed journals, book chapters, and presentations at national conferences. In 2011, a poster presented by this group won the best scientific poster award at the annual meeting of the American Academy of Cerebral Palsy and Developmental Medicine.

Over 110 children with a wide range of diagnoses have been treated in our CIMT program, which offers access to a variety of equipment including biofeedback, electrical stimulation, virtual reality devices, and assisted movement machines adapted to get the most out of the protocol.

This is an exciting time in the field of pediatric rehabilitation medicine. Technology is now available that “looks inside” the brain to yield insights into how CIMT molds neural circuitry to improve function. Transcranial magnetic stimulation and functional MRI brain imaging are techniques used at Kennedy Krieger to investigate the influence of therapies on the brain.

I hope you enjoy this issue of Neurorehabilitation Updates.

Best wishes,

Frank
When Leah was 6 months old, an MRI revealed the reason why she seemed to use the left side of her body much more than the right: she had likely experienced a stroke while in utero, resulting in hemiplegia. Fortunately, Leah was a good candidate for an intense therapy program that has been shown to greatly improve outcomes for patients with hemiplegia—the Constraint-Induced and Bimanual Therapy Program at Kennedy Krieger.

The program uses an evidence-based understanding of the brain’s natural ability to form new connections and help increase function and independence. It combines traditional constraint-induced movement therapy—which involves casting the non-affected arm to force the use of the weaker arm—with an additional period of bimanual therapy to ensure carryover of new skills.

With the help of this therapy every day for a month as an infant, Leah learned to crawl, which is an impressive milestone for a child with hemiplegia and an important building block for learning other gross motor skills. “When you’re an infant, using your hands and arms is really important—it’s how you move around, explore objects, crawl, and push yourself up,” says Teresa Garcia Reidy, MS, OTR/L, senior occupational therapist in the program. Without therapy, children with hemiplegia develop a disregard for their affected limb that may persist throughout life. But through early intervention using intense, repetitive movements, neuronal connections can be created and strengthened to help increase function of the affected limb and overall independence.

Kennedy Krieger’s clinical constraint program was one of the first of its kind in the country, and is now the only program in the region offering this therapy for infants.

“We are always looking for emerging techniques and equipment that can help our patients,” says Garcia Reidy. “If something is showing promise in current research, we are willing to try it out.”

Since 2004, the program has seen more than 100 children. Because of their clinical expertise, Garcia Reidy and her team were able to publish the first clinic-based outcome study demonstrating the effectiveness of the therapy. Leah underwent three different bouts of therapy, focusing on a different set of skills at each stage of development. Because of Kennedy Krieger’s interdisciplinary team approach, Leah was also able to receive speech therapy to address stroke-related communication difficulties, in addition to occupational and physical therapy, all in the same visit. “Nowhere else could we get that much therapy in a row,” says Leah’s mother, Maria. “That therapy was life-changing.”

These days, Leah is working on skills to prepare her for school, such as dressing herself, carrying objects with both hands, opening a marker, and turning pages in a book. These skills would have been very challenging without the early intervention she received.

Individual constraint-induced and bimanual therapy is offered for both infants and children. In summer, a group camp-like model is offered for school-aged children.

To learn more or to make a referral, visit KennedyKrieger.org/Constraint-Induced-and-Bimanual-Therapy.
Recent Peer-Reviewed Scientific Papers


Book Chapters


Recent Presentations


For more information about research studies and clinical trials at Kennedy Krieger Institute, please visit KennedyKrieger.org/Research.
Researchers Help Discover Hypothermia May Not Be Best Treatment for Cardiac Arrest in Children

A Kennedy Krieger Institute team, led by Drs. James Christensen and Beth Slomine, is part of a large-scale, NIH-funded multicenter research study that has shown therapeutic hypothermia, or whole body cooling, does not improve survival rates or mitigate brain injury in infants and children after out-of-hospital cardiac arrest. This emergency body cooling is known to improve survival and outcomes for adults after cardiac arrest and also for newborns deprived of oxygen at birth, but had not previously been studied in infants or children.

Drs. Christensen and Slomine collected and evaluated the children’s outcomes at both three months and one year after treatment. At the one-year mark, researchers observed no difference in survival or cognitive function between groups. The research findings were presented at the Pediatric Academic Societies Annual Meeting in San Diego in April, and published simultaneously in the New England Journal of Medicine.

To learn more, visit KennedyKrieger.org/Brain-Injury-Clinical-Research-Center.

New Physician Joins Kennedy Krieger Institute

Kennedy Krieger Institute is pleased to announce the addition of Sarah Korth, MD, to its medical staff. Dr. Korth will be a physiatrist in the Rehabilitation Department.

Dr. Korth comes to Kennedy Krieger from Thomas Jefferson University Hospital and Nemours A.I. DuPont Hospital for Children in Philadelphia, where she was a resident physician in pediatrics and physical medicine and rehabilitation. She is the founder and director of The Paraiso Project under Tree of Life International, a project to address the significant health disparities of the communities around Paraiso in the southwestern Dominican Republic, with the ultimate primary goal of self-sustainability.

Dr. Korth will see children with rehabilitation and physical medicine needs. To make an appointment with Dr. Korth or to learn more, call 443-923-9403 or email FindASpecialist@KennedyKrieger.org.