

BICYCLE CAMP

Children with Down Syndrome Bicycle Together

Cheryl Israel

Learning to ride a two-wheel bicycle is a rite of passage for many children. There is that sudden surge of power, the inevitable look back, and the thrill of realizing that you are balancing the bike all on your own. It is a life-changing experience that is extraordinary to observe.

After riding a two-wheeler outside, Erik grinned widely, put both thumbs in the air and shouted, "I am good!" Erin gave a high five, screamed with delight, and then broke into a dance after riding a two-wheel bicycle several feet. Andrew was less emotional, but smiled as he rode a two-wheeler around the exhibit hall for the first time. That night he went into his room, brought out three pennies and asked his mother to buy him a bike. These are typical reactions in the world of bike riding—but Erik, Erin, and Andrew face an atypical challenge.

They are all children with Down syndrome, a disability which causes varying degrees of developmental delays and problems with balance control. Last June several children with Down syndrome took the ride of their life.



Kinesiology undergraduate Cassandra Hornick works with a bicycle camp participant.

The riding took place during a five-day Bicycle Camp at the Berlin Fairgrounds in Grand Rapids, MI. A second camp was held in Macomb County, MI the following week. Sixty-three children participated in the camps, sponsored by the University of Michigan, Division of Kinesiology. The camps were held as part of a research study under the direction of faculty member

Dr. Dale Ulrich, who is internationally known for his research on children with Down syndrome. The National Down Syndrome Society, the Down Syndrome Association of Western Michigan, Samuel Westerman Foundation, and the Edward Ravitz Foundation provided funding for the camps, which will be held again in 2006.

"Only 10 to 12 percent of people with Down syndrome learn to ride a bicycle without training wheels. Teaching children to ride a bicycle independently increases their balance control, self-confidence, and self-esteem," said Ulrich. He contracted with **Dr. Richard E. Klein**, founder of Rainbow Trainers, Inc. and the Lose the Training Wheels Program™ to provide the instruction. Klein is a mechanical engineer and professor emeritus from the University of Illinois.



Dr. Dale Ulrich with a bicycle camp participant.

Dr. Klein invented an adapted bicycle for children with disabilities, with the ultimate goal of helping them ride a two-wheel bicycle. "If we can send a rocket to the

moon, we can certainly get a child with Down syndrome across the gym on a bike," he said.

The adapted bicycle has a handle at the back that allows the trainers and parents to control the bike when necessary without affecting the rider's grip on the handlebars. The bike has varying sized rollers rather than a back wheel. As the numbers (1–8) increase, the contour of the roller gets more slender and less stable, which requires the rider to exert more balance control.

Learning to Ride

"This is an emergent learning system," said Dr. Ulrich. The learning emerges over the five days of the camp. As the riders gain confidence, the bike rollers may be changed, a different gear level may be used, a weighted or over-sized front wheel may be used, all in response to the needs of the rider—and leading up to the ultimate goal of riding a two-wheel bicycle. "One of the most important steps for the children is to overcome their fear of riding," said Ulrich.

"Get your camera, we have our first rider!" announced trainer **Elaine McHugh**. Esther rode the two-wheeler amid cheers from everyone in the exhibit hall. She stopped the bike and put her head down, overwhelmed by the experience, and the short stop. Esther had control of the bicycle, but took until the middle of the next session before she overcame her fear to ride the two-wheeler again. She eventually gained complete confidence and rode the bicycle outside.

Training the Riders

The trainers are skilled at helping the riders overcome their fears. When they stop fast or fall from a bike the riders are encouraged with phrases such as “Good catch!” “Way to put your foot down!” “That was great!” The motivational words help take the focus away from the fall and let the riders know that someone is with them.

“Look up, Alisha—watch where you are going,” said trainer Robbin. Verbal cues encourage the riders to observe their environment and to continue peddling as they round a corner, both of which help them gain control of the bicycle.

The trainers watch for participation in steering, a lighter grip on the handlebars, and the position of the rollers, among other factors.

“Hillary is leaning well into the turns,” said trainer *Sue Herrington*, “and we should take her up to a seven roller.” That means that Hillary will make a pit stop so that the bicycle doctor, as Dr. Klein refers to himself, can upgrade her bicycle. Dr. Klein uses special equipment to adapt the bicycle quickly and accommodate the changes. Marjorie Klein works with her husband, Richard, to keep detailed records of the adaptations for each rider. The riders adjust to each step in the system—or they return to a more comfortable step. Hillary was upgraded to a seven roller in the middle of the 75-minute session, but toward the end of the session she was less able to concentrate, and returned to a lower-level roller.

Several of the trainers use humor to bond with the children. When Katie stopped her bike suddenly, trainer Nancy put her forehead to Katie’s forehead and said loudly, “What happened, Miss Katie?” Katie laughed, put her feet back on the peddles and went around again. Molly was riding slower and slower. Trainer *Jay Thatch* hopped on the seat, his long legs extended at right angles as he pumped the small bike, and asked Molly to guide him for a change. She laughed, followed him for a few minutes, and eventually a much-more animated Molly got back on the bike.

“It helps with training to be a professional child,” said Jay.

The majority of the children bonded with the trainers and came to each session excited to ride. “If Erin had a tail, it would be wagging,” said her mother.

Dr. Joseph Hornyak from the Physical Medicine and Rehabilitation Department at the U-M Hospital uses a skinfold caliper to measure the skin fold in the tricep and calf area.



Sixty-three children participated in the bicycle camps and 34 were participants in Dr. Ulrich’s research study at the University of Michigan.

Research Description

Dr. Ulrich’s study is a randomized clinical trial that will look at the effectiveness of the bicycle camp on the improvement and development of balance and health parameters of the camp participants. Their statistics are compared with the control group members who did not participate in the bicycle camp this year. They will participate in the 2006 bicycle camp.



Bicycle camp participant “rides with the wind outside” on a two-wheel bicycle.

They used a physical activity monitor for seven consecutive days. Several measurements—body mass index (BMI), hip and leg strength, height, weight, and balance control measurements were taken in June and August. Those measurements will be taken again in 2006 to compare the results.

Doctoral students *Meghann Lloyd*, *Julia Looper*, *Beth Smith*, and *Chad Tiernan* assisted with the research study. They also assisted with the pre-camp measurements and data gathering. Four undergraduate students assisted with the study as well.

Initial Conclusions Set Milestones

By the end of the camps over 68% of the participants had ridden a two-wheeler at least 30 feet, and many of them were virtually independent. The camps had a 100% success rate, in that there were no injuries, and every child had improved by the end of the five-day camp. For some that meant riding the roller bike for much longer by the fifth day than on the first day. For others, it meant riding a two-wheel bicycle for several feet or several hours. Others “rode with the wind” outside, and learned to navigate cement, grass, and gravel.

During all five days of the camp there was a high sense of excitement that was contagious. “The smiles on the parents and the children are priceless; this means so much to all of us,” said *Tina Castillo*. The smiles on the volunteers and the trainers were equally meaningful. Participating in the daily victories of the bicycle camp riders was a life-changing experience for all of us.



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