

Children's Mercy Kansas City

SHARE @ Children's Mercy

Our Story Continues

Our history

5-29-2013

"Mercy TAPE" Unveiled: Provides Better Weight Estimates for Children

Bill Van Kirk

Children's Mercy Hospital, bjvankirk@cmh.edu

Let us know how access to this publication benefits you

Follow this and additional works at: https://scholarlyexchange.childrensmercy.org/recent_history



Part of the [International Public Health Commons](#), [Patient Safety Commons](#), [Pediatrics Commons](#), and the [Pharmaceutical Preparations Commons](#)

Recommended Citation

Van Kirk, Bill, ""Mercy TAPE" Unveiled: Provides Better Weight Estimates for Children" (2013). *Our Story Continues*. 12.

https://scholarlyexchange.childrensmercy.org/recent_history/12

This Article is brought to you for free and open access by the Our history at SHARE @ Children's Mercy. It has been accepted for inclusion in Our Story Continues by an authorized administrator of SHARE @ Children's Mercy. For more information, please contact hlsteel@cmh.edu.

'Mercy TAPE' Unveiled

PROVIDES BETTER WEIGHT ESTIMATES FOR CHILDREN

It looks like a plain, inexpensive tape measure; but its value may be immeasurable for estimating weight of children in emergencies or when scales aren't available.

The Mercy TAPE, a device developed by Children's Mercy researchers led by Susan Abdel-Rahman, Pharm.D, Clinical Pharmacology and Medical Toxicology, was unveiled recently at the Pediatric Academic Societies (PAS) meeting in Washington, D.C. (TAPE stands for **T**Aking the guesswork out of **P**ediatric weight **E**stimation).

Children's Mercy representatives presented data demonstrating that the Mercy TAPE is more accurate than any other method currently available for children ages two months to 16 years. Accurate weight estimates are important because they are used to determine appropriate medication dosage, fluid volumes for resuscitation, breathing tube sizes, and more.

WHEN SCALES AREN'T AVAILABLE...

While the Mercy TAPE will have practical applications for Emergency Rooms and Rescue Squads, Susan's motivation was spurred by the potential for improving the health care and lives of children in less developed settings.

"The numbers are staggering," Susan said. "Worldwide, there are over one billion children living in poverty and 270 million children that don't have access to basic health care. If you look at resource-restricted settings in developing countries, the vast majority of health-care environments—whether it's a local clinic or even a hospital—likely don't even have the resources to weigh a child, which we take for granted."



Susan Abdel-Rahman, Pharm.D, Clinical Pharmacology and Medical Toxicology, led the Children's Mercy research team that developed the Mercy TAPE, a new device to estimate the weight of pediatric patients ages two months to 16 years.



The Mercy TAPE allows caregivers to take two simple measurements - the length and circumference of the upper arm - and make a quick calculation of the resulting numbers to determine a weight estimate that is within 10 percent of actual weight in about 80 percent of children, and within 20 percent of actual weight in nearly 100 percent of children, at a cost of about 1/3 of a penny per device.

full of numbers and I can go for hours without thinking about anything else. I just happen to enjoy doing that."

INEXPENSIVE ACCURACY

Nearly three years of number-crunching, prototype-development, testing and validation produced a simple-looking device that belies the complexity of thought that went into it: a tape made of paper (or other inexpensive material) used to measure the length and circumference of the upper arm. A quick calculation of the resulting numbers yields astoundingly accurate weight estimation.

The Mercy TAPE accurately predicts weight within 10 percent of actual weight in about 80 percent of children, and within 20 percent of actual weight in 98 percent of children; in essence, we get within 20 percent of actual weight in nearly 100 percent of children (including children that are malnourished or obese)...all at a cost of about 1/3 of a penny per device.

The concept for the Mercy TAPE grew out of work Children's Mercy conducted with the World Health Organization (WHO). Susan said discussions at a meeting in Geneva, Switzerland which were centered on defining proper dosages of priority medications (all of which are based on weight) prompted one of the participants to ask, "What do we do when we can't weigh the child?"

That singular pragmatic question led to a review of existing weight estimation strategies and the eventual conclusion that existing methods—such as the Broselow Tape—"aren't all that accurate in a large number of children."

There were no shortcuts to developing a better tool. "I wanted to understand mathematically why the other methods didn't work well so that we could lay the foundation for developing a new strategy," Susan said. "Figuring that out is nothing glamorous...you sit there with a data set, examine and re-examine the numbers, thinking about different ways to integrate what we know about growth and development into the model. But honestly, for me that stuff is fun...you can sit me in front of a spreadsheet

Susan said next steps include finding a commercial partner to distribute the Mercy TAPE in developed countries, finding a humanitarian partner to help distribute the device at no cost to developing countries and conducting the studies necessary to develop a comparable tool for newborns and young infants.

Reflecting on the entire project, Susan said, "It's an opportunity to contribute to the care of some of the world's most neglected children...to advocate for kids who are all too often overlooked."



-By Bill Van Kirk

Daily Enews May 29, 2013