

# Measuring arm circumference is a more reliable indicator of malnutrition

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Adam C. Levine, M.D., an emergency medicine physician at Rhode Island Hospital found that the World Health Organization's current weight-based guidelines for assessing malnutrition in children with diarrhea are not as reliable as measuring the child's upper arm circumference. His research was published in the *Journal of Nutrition*.

Diarrhea is common among [children](#) who visit health facilities in developing nations. The traditional measures for determining whether a child is moderately or severely malnourished are based on assessing the child's weight directly. Levine found that measuring the circumference of the mid-upper arm, another method of assessing under-nutrition in children that has gained popularity in resource-limited settings, was the most accurate predictor of under-nutrition in children with [diarrhea](#), because dehydration from diarrhea does not significantly affect the arm circumference but does affect the child's weight. The weight-based measures were significantly affected by dehydration, leading to a misdiagnosis of many patients.

"Because dehydration lowers a child's weight, using weight-based assessments in children presenting with diarrhea may be misleading," said Levine. "When children are rehydrated and returned to a stable, pre-illness weight, they may still suffer from severe acute malnutrition."

Using a tape measure to measure arm circumference is the most reliable factor in diagnosing malnutrition, said Levine. Tape measures are also the most practical. They are inexpensive and more readily available in

resource-limited environments than scales.

"Based on our results, clinicians and community health workers can confidently use the mid-upper arm measurement to guide nutritional supplementation for children with diarrhea," said Levine.

Lack of food is the leading risk factor for pediatric mortality worldwide, contributing to the deaths of nearly half of all children under the age of five. About half a million children die annually from severe malnutrition and nearly 100 million children are underweight, most in the world's poorest countries.

Levine and his team studied the clients of an urban hospital in Dhaka, Bangladesh, a country where six percent of its citizens live on the equivalent of \$2 a day. They analyzed 721 records of all children under 60 months of age who visited the hospital's rehydration unit with acute diarrhea. They found that 12-14 percent of children were misclassified with malnutrition using weight-based measures compared to only 1-2 percent who were measured by arm circumference.

Provided by Lifespan

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