

2-Year Outcomes of Behavior and Nutrition Treatment for Preschoolers with CF: Weight and Height Z-Score Changes Indicate Improvement in Growth



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Background and Aims

The goal for children with CF is to obtain normal growth. We conducted a clinical trial with toddlers and preschoolers focused on increasing energy intake to the recommended level of 120 to 150% Recommended Daily Allowance (RDA; Powers et al., *Pediatrics* 2005 Dec;116:1442-1450). Because challenging child mealtime behaviors and ineffective parent mealtime management strategies potentially interfere with the attainment of CF energy intake recommendations, a treatment that incorporated behavior therapy into a nutrition intervention was tested in this clinical trial. A 4-year follow-up study of this clinical trial sample is currently underway, with data for 2 years post treatment now available.

Aim 1: Examine energy intake per day and percentage of subjects who met the goal of $\geq 120\%$ RDA per day at 2 years post treatment.

Aim 2: Examine weight and height z-scores changes, CDC growth chart percentile changes, and growth velocity for each child that participated in the intervention at 2 years post treatment.

Method & Summary of Results

Nine subjects completed an 8-week behavioral and nutrition intervention. Weight and height were obtained every 6 months for 2 years post treatment. Daily energy intake, weight and height z-score changes, CDC growth chart percentile changes, and growth velocity were measured outcomes.

Post-intervention Weight and Height z-scores

$M = 0.01$ for weight & $M = -0.22$ for height (see Table 1).

Daily Energy Intake

Calorie intake was assessed for 8 of the subjects through three 24-hour diet recalls (2 weekdays and 1 weekend day).

$M = 2,589$ (± 519) kcal per day (see Figure 1).
(7 of 8 participants exceeded the goal of 120% RDA per day for energy intake at the 2-year follow up)

Weight and Height z-score Changes

$M = 0.34$ for weight & $M = 0.37$ for height (see Figure 2).

Weight and Height Percentile Changes

$M = 10.2$ for weight & $M = 10.7$ for height (see Figure 3).

Growth Velocity

Calculated as the rate of change from post treatment to 2-year follow-up, and benchmarked against the expected velocities for a same age and gender child without CF who was growing at the 50th percentile based on the 2000 CDC growth charts.

Weight: $M = 4.94 \pm 1.27$ kg over 2 yrs (Median: 4.6)
(7 of 9 subjects \geq benchmark)

Height: $M = 15.8 \pm 1.89$ cm over 2 yrs (Median: 15.7)
(all 9 subjects \geq benchmark)

Results

Table 1. Post-Intervention Weight and Height z-scores

	Weight	Height
1	.40	.62
2	.04	-.13
3	-.92	-1.34
4	1.64	1.89
5	-.70	-.88
6	.39	-.74
7	-.86	-1.09
8	.63	-.32
9	-.55	.08
Mean	.01	-.22

Figure 1. Average Daily Energy Intake

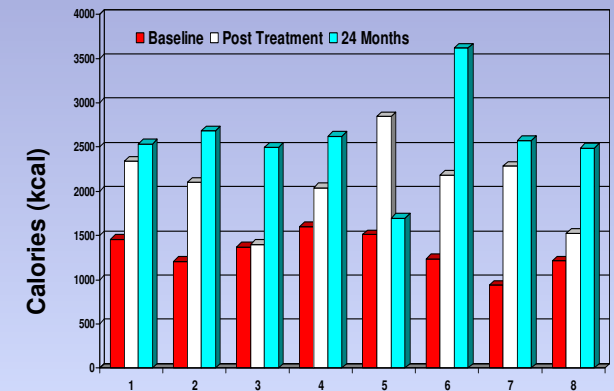


Figure 2. Z-score Changes in Weight and Height at 2-year follow-up

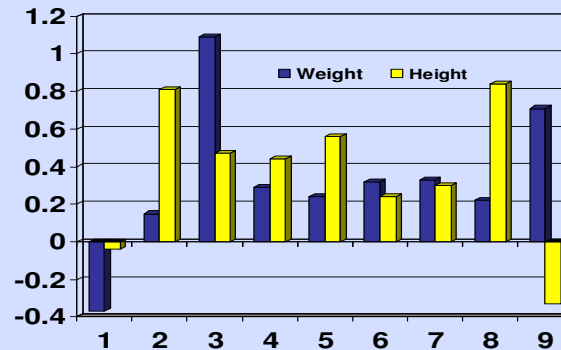
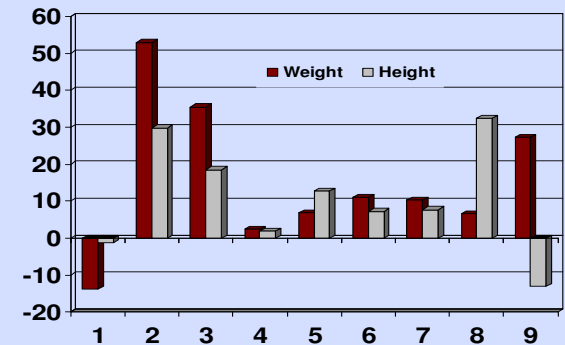


Figure 3. Individual CDC Growth Chart Percentile Changes in Weight and Height at 2-year follow-up



Conclusions

This is our first report from this clinical trial follow-up study to use z-score and percentile changes to examine each child's outcome relative to his/her own weight & height status through 2-years post-intervention. Most children are exhibiting notable improvements in growth, regardless of whether they were below or above a z-score of 0.0 post intervention. At the 2-year follow-up, results suggest that our behavioral and nutrition treatment has the potential to result in positive growth outcomes. We will continue to collect growth and energy intake data on these subjects for two more years as part of a longitudinal study. In addition, we are in the process of conducting a multi-site clinical trial examining the impact of our nutrition and behavior treatment on growth relative to a control group.