



A Brief History and Future of the Traffic Light Diet

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Lay Summary

This commentary describes the history of the Traffic Light Diet, a major component of family-based behavioral treatment, an evidence-based treatment of pediatric obesity.

As the developer of the Traffic Light Diet (TLD), I read the article by Vorland et al. (1) with great interest. The authors raise important issues about how the TLD has been used in pediatric obesity treatment. In this commentary I present the history and purpose of the TLD, position it as a component of family-based behavioral treatment (FBT), and reinforce an idea presented by the authors for future utility of the TLD.

Brief History of the TLD and FBT of Pediatric Obesity

The TLD was developed in 1978 when I was at Auburn University supervising clinical psychology graduate students who were training in a grammar school in Auburn, AL. A school nurse requested help for several Head Start students who were overweight. Because the children could not read or understand nutritional concepts, we needed a simple way to let the children know what foods to eat more or less of. A graduate student suggested categorizing foods using the traffic light colors, because children understood this concept. We implemented the system in the Head Start cafeteria using single-case experimental designs, with results indicating modification of the children's eating behavior (2).

Based on a chance encounter in the dairy aisle of a grocery store in Auburn, I overheard a parent shopping with their family saying they shouldn't buy that food, because it was a RED food. That gave me the idea that this approach could be used in families for weight control. When I moved to University of Pittsburgh School of Medicine, we demonstrated the superiority of a 5-mo behavioral treatment of childhood obesity based on the TLD plus information on activity compared with a nutrition education program without behavioral components (3). We showed a very strong relation between parent and child weight loss

which was not observed in the comparison group. Based on that study I developed an FBT grant in which we randomly assigned families to groups in which both the parent + child were targeted for behavior change and weight loss, only the child was targeted, and a control group matched for attention, but in which neither the parent nor the child was targeted (4). Given that parents arrange the shared family environment, and model behaviors the children learn, we felt it was critical for the parents to change their behavior at the same time the children were making changes. Ten-year follow-up showed that children in the parent + child group did significantly better than the children in the child-only or education control group (4). Ten-year effectiveness of FBT was replicated 3 times (5), and FBT has been established as an evidence-based treatment of pediatric obesity (6). An important part of FBT has been the concurrent treatment of parents. Parents lose substantial amounts of weight during treatment and there is a strong relation between parent and child weight changes (7).

The TLD and FBT

The TLD was designed to be a nutritionally balanced, low-energy-density, high-nutrient-density diet so children could meet dietary recommendations as they consumed fewer calories. The TLD includes limits, but not total exclusion, of RED (STOP) foods, because total abstinence could increase the value of these foods. Goals for RED foods have ranged from 2 to 4/d, so people could include healthy fats (avocados) or an occasional ice cream treat, if they kept within their calorie goal and obtained the recommended portions of food in the food groups. For a period we adopted the idea of low-fat diets to categorize foods, but low-fat diets can be high in sugar, and may not be optimal for health (8). The current version of the TLD has returned to original principles. In addition to information on nutritional characteristics of RED, YELLOW, and GREEN foods, we provide information on energy density, given the role of energy density on fullness. We recognize that labeling foods according to the Traffic Light labels can differ

based on who is doing the labeling (1), and users of the TLD need to be aware of these differences for use in their research or clinical programs (1).

FBT is a dynamic treatment, updated based on new research. We include a Traffic Light Activity program in FBT that categorizes activities based on METS (metabolic equivalents), and encourages YELLOW and GREEN activities and discourages RED very-low-expenditure sedentary behaviors. We believe the effectiveness of FBT comes from it being a multicomponent behavioral treatment that teaches parents new positive parenting skills, as well as teaching parents and children behavioral, diet, and physical activity skills needed to help regulate their body weight and meet their goals. Multicomponent programs for pediatric obesity can be evaluated by the degree of structure they provide. Griffiths et al. (9) categorized programs in terms of their degree of structure, and FBT was coded as very high structure, and associated with the greatest relative weight losses.

Future of the TLD and FBT

Given the ease with which people understand the concepts of eat as much as you want (GO FOODS), consume with caution (YELLOW FOODS), or stop and think before you eat these foods (RED FOODS), there may be many opportunities to take advantage of that idea for front-of-package labeling to promote healthy diets for point-of-purchase shopping. An idea raised by Vorland et al. (1) was the potential for tailoring the TLD to a patient's cultural or dietary norms or needs. We adapted the TLD for use for people with prediabetes. We incorporated concepts based on the glycemic index/load of foods into the labeling of foods, and included carbohydrate goals in addition to calorie goals. The program was associated with weight losses >20 lbs (9.1 kg) at 6 mo, and almost 70% of the participants went from prediabetes to normoglycemic status (10).

In summary, the TLD was developed as a nutritionally balanced, nutrient-dense, energy-restricted diet that could be used as part of a

multicomponent behavioral program for families that had children and parents with obesity.

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