Blood Pressure Management

Communicating Comprehensive Lifestyle Strategies Beyond Sodium

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Blood pressure reduction to reduce risk of cardiovascular disease is a key public health initiative, and reducing sodium intake is currently one of the lifestyle strategies promoted to achieve blood pressure lowering in the American population. Sodium reduction is to be achieved in large part by changes in the food supply, but accomplishing this will take time. Even with sodium reduction, consumer awareness and desire to reduce sodium and make other lifestyle changes will ultimately determine whether the goal of blood pressure reduction through diet and lifestyle can be achieved. The International Food Information Council surveyed consumers about their awareness and concern about sodium as well as other lifestyle behaviors that impact blood pressure. The International Food Information Council also convened an experts roundtable, "Managing Blood Pressure through Diet and Lifestyle," to explore priorities for addressing the lifestyle management of high blood pressure. A summary of the roundtable experts' discussion and the responses of consumers with high blood pressure to the questions are reported in this article. Results from both the Consumer Research and roundtable experts indicate that a holistic approach beyond sodium reduction is needed to manage high blood pressure to reduce risk of cardiovascular disease. This approach may include messaging to consumers and medical professionals about weight management, more fruit and vegetable intake, and more physical activity. Nutr Today. 2012;47(4):183–190

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Multiple factors affect blood pressure. Uncontrollable risk factors include heredity, race (blacks have higher rates than whites), and age (blood pressure increases with age), whereas modifiable risk factors include overweight/obesity, diet, and physical activity. Lifestyle strategies to affect controllable risk factors include losing weight if overweight, eating more fruits and vegetables, reducing sodium, becoming more physically active, and moderating alcohol intake.[1,2] The effects of lifestyle modifications vary from person to person, but for many, these changes will reduce the need for medications.[3] Additionally, it appears that multiple lifestyle interventions incorporated simultaneously yield the greatest and most sustained blood pressure effect.[4] However, dietary surveys and consumer opinion research, as well as clinical experience of healthcare providers, indicate that few people implement or sustain these lifestyle strategies to manage their high blood pressure. A combination of barriers, including lack of awareness, has been reported.[3,5] Although multiple evidence-based strategies are part of standards of practice for treating high blood pressure,[3] a focus on sodium reduction has gained the most attention. The 2010 Dietary Guidelines for Americans (DGA) states: "reduce daily sodium intake to less than 2300 mg and for some persons including those who are 51 years or older and those of any age who are African American or have hypertension, diabetes, or chronic kidney disease to reduce intake to less than 1500 mg per day."[6] Thus, public health efforts have become focused on the potential of substantial sodium reduction to lower blood pressure at the population level and to a much more limited extent, the other lifestyle modifications that can exert real and significant changes in blood pressure. At the same time, the food industry has responded by committing to a gradual and safe reduction in sodium in the food supply.

Since 2006, the International Food Information Council (IFIC) Foundation has conducted its annual *Food & Health Survey*,[5] designed to gain insights from Americans on important food safety, nutrition, and health-related topics. In 2009, IFIC commissioned a separate Consumer Research project to assess concerns, perceptions, and actions taken

*The IFIC's Mission is to communicate science-based information on food safety and nutrition to health and nutrition professionals, educators, journalists, government officials, and others providing information to consumers. It is primarily supported by the food, beverage, and agricultural industries.

toward sodium.[7] The 2009 IFIC Consumer Research respondents had a low level of awareness and concern about sodium intake.[7] Since that time, numerous scientific studies, official reports, and reduction efforts by food manufacturers and food service providers have contributed to the increased public policy and media attention given to sodium. For example, the 2010 DGA[6] called for as much as 70% of the population to restrict their sodium intake to 1500 mg/d, an important change from the 2005 DGA that recommended 2300 mg/d for the population.[8] Some scientists have suggested this is not easily done.[9] Because of the renewed focus on sodium, in 2011 IFIC repeated the Consumer Research to assess awareness and behaviors about sodium and blood pressure.[10] Additionally, in the fall of 2010, IFIC convened a roundtable of thought leaders in the area of health and nutrition (referred to as the roundtable experts) to consider the best ways to prevent or manage high blood pressure through positive lifestyle strategies. The roundtable was held after the Institute of Medicine released its report, *Strategies to Reduce Sodium Intake in the United States*,[2] but prior to the release of the 2010 DGA sodium recommendation.[6] This article presents a summary of the roundtable experts discussion and selected results from the 2011 IFIC Consumer Research.[10]

THE ROUNDTABLE

Ten thought leaders, including experts in fields of chronic disease, food science, nutrition, communications, public health, and public policy engaged in a discussion to help consumers implement a comprehensive lifestyle approach to blood pressure management, to identify potential communication research gaps, and to move toward message development about lifestyle modifications for both consumers and health professionals. They discussed lifestyle strategies, including and beyond limiting sodium, which could impact blood pressure management. The roundtable experts' collective experience was that even the most knowledgeable and motivated consumer would have difficulty meeting a recommendation to limit sodium intake to 1500 mg/d without changes in the food supply. The 2010 Institute of Medicine report called for public and private sectors to promote policies that help people make lifestyle changes that combat hypertension for the population.[1] These strategies include engaging in regular physical activity, cutting calories, reducing intake of high-sodium foods, and increasing the consumption of produce and other foods containing potassium. The roundtable discussion mostly focused on the urgency to help those who already have high blood pressure or those at risk for hypertension by developing messages and strategies to reach different consumer groups. To be successful, these policies and programs need to include actionable, empowering, targeted, and positive messages. The roundtable experts identified existing policies and programs that can be revitalized and individualized for specific audiences and cultures.

Acknowledging the Efforts to Reduce Sodium in the Food Supply

The roundtable experts recognized the complexities of reducing sodium in the food supply and the ongoing efforts by members of the restaurant and packaged food industries to do so. Food industry commitments range from 10% to 45% reduction in sodium with target dates between now and 2015. Acknowledging that the sodium content of the food supply will gradually change, the roundtable experts focused on other effective but underutilized strategies for managing high blood pressure such as weight management, eating more fruits and vegetables, being physically active, and moderating alcohol intake. The roundtable experts noted several reports, either published or expected shortly, that support a holistic approach to blood pressure management (Table 1). All include sodium reduction strategies but recognize the importance of lifestyle changes to improve population health. The strategies of weight management, eating more fruits and vegetables, being physically active, and moderating alcohol intake may be more feasible for an individual to accomplish than reducing sodium intake to recommended levels and may be more consistent with consumer views on factors that contribute to a healthy diet as documented in the IFIC 2009 Consumer Research.[7] All experts agreed that, in the short run, individuals reducing their sodium intake without making other lifestyle changes will not sufficiently reduce hypertension in the American population. Limiting blood pressure education to only sodium reduction does not equip consumers to take sufficient action to effectively manage their blood pressure.

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Major Priorities for Managing Hypertension: Simple But Not Easy

Three priorities emerged from a discussion of nonpharmacological approaches to address high blood pressure: decrease weight if overweight, increase fruit and vegetable intake, and increase physical activity. Obesity is the primary issue impacting hypertension rates in the United States, and addressing the need for population-wide weight management could significantly impact hypertension rates. In addition, lowering calorie intake would likely lower sodium intake.[†] Weight management is a key goal of the 2010 DGAs.[6] Policies, programs, and messages should encourage increased fruit and vegetable intake, especially

TABLE 1 What Is Happening: Selected Current and Upcoming Government Policies and Programs

Agency	Policy/Program Report Title	Description
Institute of Medicine	*Population-Based Policy and System Change Approach to Prevent and Control Hypertension*; February 2010 (1)	Developed for Centers for Disease Control and Prevention so that public health efforts could be focused on the highest priority areas for hypertension reduction and control. Importantly, the report emphasized early recognition and treatment of hypertension by clinicians. While not discussed in this article, good medical care is a pillar of a holistic lifestyle approach to the hypertension problem, especially when applied in a preventive fashion.
US Department of Agriculture and Health and Human Services	*Dietary Guidelines for Americans 2010* (6)	This guidance advocates weight loss and increased fruit and vegetable intake, among other recommendations, as well as educational approaches that can inform strategies to promote lifestyle changes.
National Heart, Lung and Blood Institute	*The Eighth Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure* (*JNC8*)	Update of 2003 clinical guidelines for hypertension.[3] Expected in 2012. As in current report, this is expected to include clinical, nutritional, and behavioral recommendations to manage blood pressure—all components of a holistic approach.

using the diet studied in the Dietary Approaches to Stopping Hypertension (DASH) trial.[11] The DASH trial published in 1997 demonstrated that a diet that emphasizes fruits, vegetables, and low-fat dairy products; that includes whole grains, poultry, fish, and nuts; that contains only small amounts of red meat, sweets, and sugar-containing beverages; and that contains decreased amounts of total and saturated fat and cholesterol lowers blood pressure substantially both in people with hypertension and those without hypertension, as compared with a typical diet in the United States.[11] The DASH trial has been described in both the 2005 and 2010 DGAs.[6,8] Roundtable experts identified policies "incentivizing" fruit and vegetable intake[12–14] such as allowing fresh produce to be purchased by participants in The Special Supplemental Nutrition Program for Women, Infants, and Children (better known as the WIC Program) with their WIC vouchers. Another example cited was the "Wholesome Waves" program,[14] which doubles Supplemental Nutrition Assistance and WIC voucher value when redeemed at farmers' markets. This program is offered in 20 states through a public-private partnership. Although these programs focus on improving access to fresh produce, the roundtable experts agreed that consumption of all forms of fruits and vegetables (eg, raw, frozen, dried, and canned) must be encouraged.

[†]During the public deliberation of the Dietary Guidelines Advisory Committee, it was stated that there is a link between caloric and sodium intake, with a ratio of 2 mg sodium per calorie. A modest decrease of 10% calories from a 2500-calorie diet could result in a daily reduction of 500 mg of sodium, a 15% decrease in sodium based on Centers for Disease Control and Prevention average daily sodium intakes (for those 2 years or older).

Educational materials and program resources are available online through government agencies and nonprofit health organizations (see Table 2 for examples of programs). The roundtable experts believe that all these programs are underutilized, unfortunately. They agreed it is important to support ways to increase physical activity by sustained programs in schools, workplaces, and other settings. Another approach would be improving the "built" environments with sidewalks and amenities to support safe physical mobility. This also includes increased access to venues where physical activity can be performed. These priorities are consistent with the vision of the 2010 DGAs in the incorporation of the Physical Activity Guidelines for Americans.[15]

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Message Creation for Hypertension Prevention, Management, and Treatment

Using scenarios depicted in Table 3, the roundtable experts suggested the following steps for creating messaging that would empower individuals to make lifestyle modifications. These ideas were generated in small group discussions of roundtable experts, each group considering a different

TABLE 2 Examples of Government Programs or Resources Targeting Nutrition, Physical Activity, or Blood Pressure Management

Program Name	Agency and Web Site	Program Description	Materials Available
Lean Works: Leading Employees to Physical Activity and Nutrition	Centers for Disease Control & Prevention, www.cdc.gov/leanworks/	Provides work sites with resources, information, and templates to implement work-site wellness programs	• PowerPoint presentations, templates for surveys, newsletters, and many downloadable materials
Let's Move: America's Move to Raise a Healthier Generation of Kids	White House, www.letsmove.gov	Encourages communities, schools, teachers, healthcare providers, parents, and kids to take actions toward a healthier lifestyle	• Take action tip sheets • Recipes and cooking videos • Social networking sites to interact and ask questions
SmallStep.gov	Health and Human Services, www.smallstep.gov	• Simple tips for adults and kids to eat healthier food, watch portions, and be more physically active	• Recipes, goal-setting information, calorie and activity calculators, etc
DASH Eating Plan	National Heart, Lung and Blood Institute, www.nhibi.gov	• Description of how to treat or prevent hypertension by following a specific eating pattern called the DASH diet	• Downloadable, reproducible brochure
MyPyramid Tracker	US Department of Agriculture, www.cnpp.usda.gov/MyPyramidTracker.htm	• Online dietary and physical activity assessment tool	• Provides information on diet quality, physical activity status, related nutrition messages, and links to nutrient and physical activity information

Abbreviation: DASH, Dietary Approaches to Stopping Hypertension.

target audience and identifying behaviors, primary motivators, messages, and communication channels that would move consumers to action. The roundtable experts concluded that individual lifestyles vary widely, and addressing specific behaviors can have a great impact on the management of high blood pressure regardless of race, weight,

TABLE 3 Hypertension Messaging Approaches for Different Audiences

Target Audience	Maxed Out Mom, With Financial Resources, With an Overweight Child	30-y-Old Latino Man, Limited English, Sole Provider for His Family, Smoker	50-y-Old African American Female, No Children in Household; Active in Community and Church
Targeted behaviors	Use data to identify	Use data to identify	Use data to identify
Motivators	Small, encouraging steps she can take today that are doable and help her care for her family	Ability to provide for family	Looking good and feeling good
Potential message(s)	• "Add one fruit to your family's evening meal." • "Bananas are an easy snack." • "Spaghetti sauce counts as a vegetable."	"Caring for you is caring for them" Montage of images of healthy man with family eating colorful array of fruits, vegetables, walking, tossing aside cigarettes (but not littering)	• "Walk off the (blood) pressure." • "'More' is less when you fill up on fruits and vegetables."
Possible communications channels	• E-mail, "Mommy" blogs, online information	• Children (through schools) • Radio programming targeted to Latinos	• Churches, community groups

TABLE 4 Parameters to Guide Message Development

■ Focus message on the positive, not the punitive. Address things that will be meaningful to a specific person's goals, needs, and lifestyle on an emotional level
■ Target behaviors, not numbers (milligrams, millimeters, etc); address "what" and "how" rather than "why"
■ Meet people where they are rather than where you want them to be (eg, harm reduction model)
■ Direct people to take actions that will make them feel successful, and they are likely to take another step afterward
■ Use prescription pads to write health "prescriptions" such as to eat more fruits and vegetables or take a 15- to 20-min daily walk
■ Instill confidence in people that they can make these behavioral changes
■ "Show" rather than "tell" whenever possible; use low literacy approaches (simple, clean, to the point, easy to read) that work well for most people

or socioeconomic status. Table 4 lists the parameters discussed that could guide message development.

Summary

The thought leaders in the area of health and nutrition participating in this roundtable discussion concluded that the highest priority should be given to addressing the following 3 key factors to managing high blood pressure: (1) improving weight management, (2) increasing fruit and vegetable intake, and (3) increasing physical activity. They believed that there are existing messages and programs that address risk factors for hypertension that could be fine-tuned. Just as other researchers have concluded,[16] there is a need for additional materials to address specific target audiences because factors such as race/ethnicity and rural/urban status can have differing effects on actions individuals take to control high blood pressure as well as the advice offered by healthcare providers.

IFIC CONSUMER RESEARCH

A nationally representative sample of 1003 adults (18 years or older) living in the United States participated in the 2011 Web-based IFIC Consumer Research conducted by Cogent Research of Cambridge, Massachusetts.[10] The 74-question survey was administered in spring 2011. As many women as men completed the survey. Most were white (74%), with 12% describing themselves as black. Half (50%) were married, and 26% reported having children younger than 18 years living in their home. About a third (30%) were 55 years or older. Most (55%) had more than a high school diploma, and about 40% earned less than $50 000 per year. The 2011 IFIC Consumer Research found nearly half of all respondents (46%) "don't know" daily sodium recommendations, and another 24% incorrectly stated the recommendation. Only 42% are concerned about their sodium intake. Additionally, 42% also reported currently trying to limit their sodium intake. This low level of concern among the general population is also shared by those adults who have high blood pressure or are at risk for hypertension. Of those who said they are currently limiting their sodium intake or had tried limiting sodium in the past (n = 462), 43% reported doing so to manage a current health condition.

The rest of this article describes the IFIC 2011 Consumer Research[10] responses of an at-risk group (told to limit their sodium intake, have high blood pressure, or have significant risks for hypertension) to questions about their sodium consumption, perceptions of low-sodium products, and preferences regarding communication about sodium. Their responses to most questions were remarkably similar to those of all consumers who completed the survey.

Additional responses to the survey questions can be found in the 2 Consumer Research reports[7,10] published by IFIC and available at www.foodinsight.org.

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Consumers With High Blood Pressure Speak About Factors Affecting Blood Pressure

Of the 1003 adults in the 2011 IFIC Consumer Research,[10] 290 (29%) reported having high blood pressure, with most but not all (78%) currently receiving treatment for the condition. Others who answered this survey and were considered at risk for hypertension were overweight or obese (62%), African American (12%), and older than 55 years (30%); have heart disease (7%); and/or have diabetes (12%). Only 25% of the participants reported that they were overweight or obese, yet using their reported heights and weights to calculate the body mass index found 33% would be classified as overweight and 29% as obese. Those reporting high blood pressure were more likely to be white (82%) and male (53%) and living in the southern region (42%).

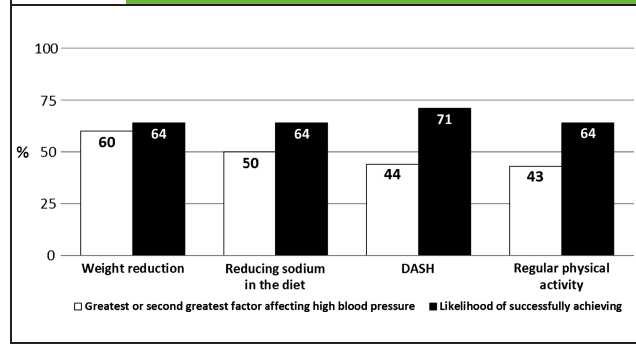
Survey participants were presented with the 5 diet and physical activity lifestyle factors known to affect blood pressure listed in the national high blood pressure guidelines.[3] They were asked which 2 were most likely to affect

blood pressure and least likely to affect blood pressure, as well as how likely they would be in successfully making that behavior change (Table 5). Note that while the participants were asked about "eating a balanced diet rich in fruits and vegetables, whole grains, and low-fat dairy foods," otherwise known as the DASH Diet, for the rest of this report we will refer to that factor as "DASH." Consumers with and without high blood pressure gave similar answers, so for most questions only the percentages for those with high blood pressure are given. They were asked to rank which diet and lifestyle factors they believe most affect high blood pressure and also asked their likelihood at successfully achieving them. Weight reduction was perceived to have the most impact on high blood pressure, while the majority believed DASH to be the diet or lifestyle change they would most successfully achieve (Figure). Moderation of alcohol consumption was considered the least important by more than half (55%) who participated. There were a few small differences in answers of those who were at risk for high blood pressure, especially if they were obese. Generally, those who were obese were more likely to say that weight reduction would have the greatest impact and less likely to say DASH has the greatest impact on blood pressure.

Consumers With High Blood Pressure Speak About Sodium

Because reducing sodium intake is a public health primary target for improving blood pressure, the IFIC surveys[7,10] asked specific questions about sodium. In 2011, 62% of those with high blood pressure were told to reduce sodium intake, most often by medical professionals (93%) and/or family members (32%). Unfortunately, the specific advice received (eg, given a specific low sodium diet or sodium goal [in milligrams] or told to only avoid salty foods and/or to "use less salt") is not known. Whereas 66% of those with high blood pressure in the 2011 IFIC Consumer Research say they were currently trying to limit their sodium intake, most respondents (59%) did not know how much they personally consumed. When asked about their approach to sodium consumption, the top reasons cited for limiting sodium were to manage a current health condition (77%), improve overall health (67%), to reduce water retention (28%), and because they had read or heard that they should (19%). For those who were not trying to limit sodium, they cited the following reasons: taste (47%), not convinced they need to or don't really care (29%, 22%) respectively, lack willpower (29%), or am in good health (26%). Few (13%) stated they do not know how or are confused by conflicting information (16%). Almost half (45%) responded they "don't know" the amount of sodium recommended to be consumed by a healthy individual. Of the 55% who ventured to guess the daily sodium recommendation for healthy individuals, 21% said 1500 mg and 9% said 2300 mg.

FIGURE Consumers Rank the Perceived Effect of Select Lifestyle Changes on High Blood Pressure and Their Likelihood to Achieve Them



DISCUSSION

The 2009 and 2011 Consumer Research[7,10] and the 2010 roundtable results show consistency in the perceptions by both consumers and health and nutrition experts—that blood pressure reduction includes but is broader than reducing

TABLE 5 Success in Implementing Lifestyle Changes Recommended in National Guidelines[3]

Behavior	All (n = 991) %	With High Blood Pressure (n =288) %	Overweight/Obese (n = 278/251) %	>55 y (n = 305) %	Blacks (n = 121) %
Moderate alcohol	73	76	68/75	72	74
DASH	70	71	70/60	76	66
Physical activity	66	64	70/52	66	63
Reduce weight, if overweight	63	64	67/50	63	62
Reduce sodium	60	64	60/61	67	56

sodium. Most importantly, both consumers and experts are optimistic that lifestyle strategies can work.

Several research groups have explored lifestyle changes adults make to manage their high blood pressure. Ellis and coworkers[16] found that individuals with hypertension were more likely to take action to control their blood pressure if advised to do so by a healthcare provider. They were 6 times more likely to reduce alcohol, 4 times more likely to reduce sodium intake, 3 times more likely to change their food intake, and 2 times more likely to be more physically active when given advice.

In a study of physicians' counseling about hypertension, Bell and Kravitz[17] reported that physicians offered an average of 1.9 lifestyle modifications in 76.7% of visits, in descending order of frequency: physical activity/exercise (54.2%), healthy eating (38.3%), weight loss/control (30.8%), smoking avoidance/cessation (19.2%), alcohol avoidance/moderation (15%), stress management (14.2%), and sodium restriction (14.2%). The low percentage reporting giving sodium restrictions is a bit surprising and not consistent with other reports.

Lopez and coworkers[18] found that adults with a diagnosis of hypertension who participated in the 1999–2004 NHANES surveys were advised to reduce their dietary sodium (81.7%), to exercise more (79.3%), to lose weight (65.5%), and to reduce alcohol consumption (31%), with 88% reporting success. The 2011 IFIC Consumer Research results on participants' potential for success in achieving these lifestyle changes are slightly different, specifically: 64% to reducing sodium in the diet, 64% to weight reduction (if overweight), 76% to moderating alcohol consumption, and 71% to following DASH. Lopez and colleagues[18] did not report advice about DASH.

Healthcare professionals and researchers agree that more work is needed to understand ways to encourage healthful lifestyle counseling sessions for all patients at risk for or with hypertension.[18] Hypertensive patients receive little information on the beneficial lifestyle changes for reducing hypertension during visits with their physician.[17] The DASH dietary pattern has been shown to complement sodium restriction and weight loss, but few Americans with hypertension have diets even modestly accordant with DASH, and perhaps secular trends have minimized the impact of the DASH message over time.[19]

Because such a large percentage of the survey respondents believe they can be successful changing their dietary habits that affect blood pressure, it is important to provide them with the information that will aid success. The majority of respondents in the 2011 IFIC Consumer Research that were advised to reduce sodium intake were told by a medical professional. However, they appear to have less than optimal information and tools to do so. Ayala and coworkers[20] also reported that adults with hypertension are trying to take action. The IFIC Consumer Research suggests that adults with high blood pressure want to learn both from the medical community and from the food package. The IFIC Consumer Research[7,10] delved deeper into consumer views about sodium than other published reports and can be used to guide messaging about the role of sodium in blood pressure management. Messages need to be targeted to both consumers and medical professionals.

Current public health approaches remain focused on sodium reduction as the primary strategy by which to reduce blood pressure in the population. Since the roundtable and the IFIC Consumer Research, other efforts to support the consumer in reducing sodium intake have been announced. In September 2011, the "Million Hearts" Initiative was announced by the Department of Health and Human Services (see http://millionhearts.hhs.gov). It calls for a reduction in sodium in processed and restaurant foods along with education to enable individuals make informed choices.[21] In fall 2011, the Food and Drug Administration requested comments, data, and information about approaches to reduce sodium consumption both through education and by changes in the food supply.[22]

Sodium reduction is one intervention. The survey results and the roundtable experts support the observation that consumers feel they can be successful using lifestyle strategies in addition to sodium reduction to manage their blood pressure and reduce their risks for cardiovascular disease.

SUMMARY

Although many public health officials, healthcare providers, and consumers view reducing sodium intake as the primary lifestyle target for blood pressure management, it should be considered as only 1 lifestyle change. So, while the food industry continues to reduce sodium in its products and consumers attempt to limit their sodium intake through food purchases and changes in food preparation techniques, they also need education about other lifestyle modifications including weight management, increased fruit and vegetable intakes, and increased physical activity, which have been demonstrated to be equally or more effective strategies for many with borderline or high blood pressure. Limiting blood pressure reduction education to sodium reduction does not equip consumers to take sufficient actions to effectively lower their blood pressure. Consumers with high blood pressure need information and tools about all strategies to lower blood pressure. The IFIC Consumer Research, along with the recommendations from the IFIC roundtable, can be used to develop broader strategies and messaging to healthcare professionals as well as those with high blood pressure. Strategies tailored to both consumer and health professional audiences as well as positive messages that recognize holistic lifestyle approaches beyond a sodium focus can lead to successful

management of blood pressure by engaged consumers participating in making healthful lifestyle choices.

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The Science of Sugars, Part I: Erratum

In the article that appeared on page 96 of the May/June 2012 issue, the citation for reference 23 at the end of the 1st paragraph under the "Added Sugars" section on page 100 should have been attributed to:

> Institute of Medicine (IOM). Dietary carbohydrates: sugars and starches. In: Spears GE, ed. *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids*. Washington, DC: National Academies Press; 2002: 265–338.

In the following paragraph, the citation for reference 23 should have been attributed to:

> US Department of Agriculture and US Department of Health and Human Services. *Dietary Guidelines for Americans, 2010*. 7th ed. Washington, DC: US Government Printing Office; 2010. Table 2–12.

On page 99, in the "Consumption of Sugars" section, paragraph 3, the amount the daily consumption of caloric sweeteners decreased should have been listed as 134 g in 1999 and 116 g in 2009 (Source: US Department of Agriculture Economic Research Service. Loss adjusted food availability. http://www.ers.usda.gov/data-products/food-availability-%28per-capita%29-data-system.aspx. Accessed July 19, 2012).

The url listed in reference 16 should have been:

> http://www.ers.usda.gov/data-products/food-availability-%28per-capita%29-data-system.aspx

On page 100, in the third paragraph of the "Added Sugars" section, the decrease in the consumption of added sugars should have been 24%, with a starting point of 100.1 g/d. The decline in added sugar from soda consumption should have been listed as 39%, and references to "soft drinks" and "sugar-sweetened beverages" in that paragraph should have been listed as "soda."

REFERENCE

Schorin MD, Sollid K, Smith Edge M, Bouchoux A. The science of sugars, part 1: a closer look at sugars. *Nutr Today*. 2012;47(3):96–101. DOI: 10.1097/NT.0b013e31826a2b2d