

# Use of Nutrition Standards to Improve Nutritional Quality of Hospital Patient Meals: Findings from New York City's Healthy Hospital Food Initiative



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## ARTICLE INFORMATION

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## ABSTRACT

**Background** Most hospital patient meals are considered regular-diet meals; these meals are not required to meet comprehensive nutrition standards for a healthy diet. Although programs exist to improve nutrition in hospital food, the focus is on retail settings such as vending machines and cafeterias vs patient meals. New York City's Healthy Hospital Food Initiative (HHFI) provides nutrition standards for regular-diet meals that hospitals can adopt, in addition to retail standards.

**Objective** This study was undertaken to describe regular-diet patient menus before and after implementation of the HHFI nutrition standards.

**Design** The study involved pre- and post- menu change analyses of hospitals participating in the HHFI between 2010 and 2014.

**Participants/setting** Eight New York City hospitals, selected based on voluntary participation in the HHFI, were included in the analyses.

**Main outcome measures** Nutritional content of regular-diet menus were compared with the HHFI nutrition standards.

**Statistical analyses performed** Nutrient analysis and exact Wilcoxon signed-rank tests were used for the analysis of the data.

**Results** At baseline, no regular-diet menu met all HHFI standards, and most exceeded the daily limits for percentage of calories from fat ( $n=5$ ), percentage of calories from saturated fat ( $n=5$ ), and milligrams of sodium ( $n=6$ ), and they did not meet the minimum grams of fiber ( $n=7$ ). Hospitals met all key nutrient standards after implementation, increasing fiber (25%,  $P<0.01$ ) and decreasing sodium (−19%,  $P<0.05$ ), percentage of calories from fat (−24%,  $P<0.01$ ), and percentage of calories from saturated fat (−21%,  $P<0.05$ ). A significant increase was seen in fresh fruit servings (667%,  $P<0.05$ ) and decreases in full-fat and reduced-fat milk servings (−100%,  $P<0.05$ ), refined grain servings (−35%,  $P<0.05$ ), and frequency of desserts (−92%,  $P<0.05$ ).

**Conclusions** Regular diet menus did not comply with the HHFI nutrition standards at baseline. Using the HHFI framework, hospitals significantly improved the nutritional quality of regular-diet patient menus. The standards were applied across hospitals of varying sizes, locations, menu types, and food service operations, indicating feasibility of this framework in a range of hospital settings.

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**P**OOOR DIETARY INTAKE CONTRIBUTES TO THE LEADING causes of death and disease burden in the United States,<sup>1</sup> and increasing emphasis has been placed on the importance of environmental interventions that support healthy eating. Prominent public health bodies, including the Centers for Disease Control and Prevention and Institute of Medicine (IOM), have identified health care institutions as key venues for preventing obesity and diet-related disease by adopting policies and practices to improve their food environments, although the emphasis has been largely on retail environments such as cafeterias and vending machines, not

patient meals.<sup>2,3</sup> Despite this, patient meals constitute the largest percentage of food served in hospitals, with an average of over \$1.7 million spent per US hospital on food purchases in 2011.<sup>4</sup> By improving the nutritional quality of foods purchased and served to patients, hospitals are optimally positioned not only to improve patient nutrition, but also to use their immense purchasing power to influence supply-side availability of healthful products.

The lack of attention given to patient food may be attributable to the expectation that inpatient meals already adhere to nutritional guidelines.<sup>5,6</sup> In fact, little is known about the

nutritional composition of patient food. Although hospitals are required to adopt a diet manual approved by medical staff to comply with accreditation standards and state regulations, the focus is on treatment and management of acute and chronic conditions rather than prevention of diet-related chronic diseases.<sup>7</sup> The “regular” patient diet, which accounts for most inpatient meals served in hospitals and is the core diet on which therapeutic diets are based, is largely unrestricted and is not required to meet national nutrition standards for a healthy diet, such as the comprehensive nutrition requirements put forth by the Dietary Guidelines for Americans.<sup>8</sup> Few studies have closely analyzed the nutrient profile of patient meals, and those that have found that regular diets fall short of national nutrition recommendations, including guidelines set by Healthy People 2000,<sup>9</sup> the National Research Council,<sup>10</sup> the National Cancer Institute,<sup>9</sup> and the American Heart Association.<sup>11</sup> Other studies analyzing regular, diabetic, and sodium-restricted diets have found that meals served to patients exceed the Institute of Medicine’s upper limit for daily sodium intake, in some settings by more than 1,000 mg/day.<sup>12-14</sup>

For patients not requiring therapeutic meals, the regular diet is an opportunity to reinforce public health messaging by modeling a healthy diet that aligns with national recommendations. Research has shown that hospitalization for lifestyle-related illnesses increases motivation for behavior change<sup>15-17</sup> and that the inpatient stay is an optimal time for clinicians to address preventive care, particularly in patients who would not otherwise seek health services.<sup>18,19</sup> Studies in cardiac patients<sup>20-22</sup> and cancer patients<sup>23</sup> have found that people are likely to make dietary changes immediately after hospitalization. Hospital-based interventions, such as smoking cessation programs, have successfully changed behaviors when introduced in acute care settings.<sup>24-28</sup> Even during a short stay in which a registered dietitian nutritionist (RDN) does not directly provide patient education, hospitals can model healthy behaviors by serving nutritious meals that align with national recommendations for health promotion and disease prevention.

Although patient food could be used as an educational tool, hospital-based wellness programs do not consistently address meals served to patients. In a recent paper reviewing healthful food procurement policies, the Nutrition Committee of the American Heart Association described programs targeting hospital food environments, which included interventions targeting cafeterias, vending machines, and patient meals.<sup>29</sup> Of the six programs referenced, most either did not offer guidelines for patient meals or provided guidelines as part of a larger hospital-wide program to reduce availability of fried foods and sugary drinks, or to increase fruits, vegetables, and whole grains. Only one program, The New York City (NYC) Department of Health and Mental Hygiene’s (Health Department) Healthy Hospital Food Initiative (HHFI), set nutrient-based food procurement standards and standards for food served in regular-diet patient meals.<sup>29</sup>

Evaluations of programs to improve the hospital food environment have focused on retail settings without examining strategies to align regular-diet patient meals with national nutrition standards. The NYC Health Department’s HHFI provides nutrition standards for regular-diet patient meals that hospitals can adopt, including nutrient guidelines for foods purchased and nutritional requirements for meals

served. This study describes NYC hospital regular-diet patient menus before and after implementation of the HHFI patient meal standards and shows how healthful food policies can provide a framework to improve nutrition in patient meals.

## MATERIALS AND METHODS

The HHFI provides nutrition standards for patient meals, which were developed by the NYC Health Department and are based on the 2010 Dietary Guidelines for Americans<sup>30</sup> and IOM Dietary Reference Intakes.<sup>31</sup> The nutrition standards aim to improve the overall nutritional quality of regular-diet menus by improving the nutrient profile of menus (eg, limiting sodium, increasing fiber) and selecting foods that align with national recommendations for disease prevention (eg, more fruits, vegetables, and whole grains).<sup>32</sup> The HHFI patient meal standards only apply to regular-diet menus; modified menus for therapeutic diets, such as diabetic or renal diets, are not subject to the standards. Participation in the HHFI is open to all public and private hospitals in NYC, and at the time of this study 37 hospitals were participating. For this study, all 15 public hospitals were excluded because adoption of the patient meal standards is mandatory per Mayoral Executive Order 122, which specifies that all government agencies that procure food must comply with nutrition standards. Of the remaining 22 private hospitals participating voluntarily, one hospital was exempt from the patient meal standards because all inpatients required therapeutic diets. Seven hospitals were excluded based on inability to provide full-cycle menus and product data for nutrition analysis at baseline and follow-up. Of the remaining 14 hospitals, nine belonged to three hospital systems. To prevent duplication of results, the first hospital in each system to provide baseline and endline data was used in the analysis, leaving one hospital from each system and five independent private hospitals. This study is based on data from the resulting sample of eight private hospitals participating in the HHFI between August 2010 and May 2014.

Hospital sample characteristics are described in detail in [Table 1](#). Hospitals ranged in size from 325 to 1,121 beds and were located in Brooklyn, Queens, Manhattan, and the Bronx. Preparation and delivery of patient meals was either self-operated by the hospital’s food and nutrition department or contracted through a food service management company. Hospitals used a conventional foodservice system, in which menu items are prepared immediately before service, or a cook-chill foodservice system, in which menu items are prepared in advance, rapidly chilled, and reheated before service. Menus were nonselect, meaning patients were not able to choose preferred menu items; select, meaning patients could choose between two or several options for each menu category (eg, entrée, side, dessert); or restaurant-style, meaning patients could select from a variety of options that are cooked to order. Collectively, these facilities prepare and serve 4.2 million patient meals each year.

Regular-diet menu data were collected from hospitals through technical assistance provided by Health Department RDNs. Hospitals submitted patient menus at baseline and endline. “Baseline” was defined as the date the hospital agreed to begin implementing the standards for patient meals, and it occurred between August 2010 and September 2013. “Endline” was defined as the date all menu changes

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