Promoting Healthy Food Choices in the Hospital: Traffic Light Labels and More

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Overview

• Background: Obesity, “toxic” food environment, and the hospital setting

• Behavioral economics and strategies to promote healthy food choices

• Summary and next steps
Age-Adjusted Prevalence of Obesity and Diagnosed Diabetes Among U.S. Adults

1994

Obesity (BMI ≥ 30 kg/m²)

Diabetes

Age-Adjusted Prevalence of Obesity and Diagnosed Diabetes Among U.S. Adults

2004

Obesity (BMI ≥ 30 kg/m²)

Diabetes

Missing Data
14.0 – 17.9%
18.0 – 21.9%
22.0 – 25.9%
≥26.0%

Missing data
4.5 – 5.9%
6.0 – 7.4%
7.5 – 8.9%
≥9.0%

The Epidemiological Triad as it applies to obesity*

HOST
Non-modifiable factors: genes, age, gender
Modifiable factors: behaviors and attitudes

EDUCATIONAL, BEHAVIORAL, AND MEDICAL INTERVENTION

FOOD ENVIRONMENT; TECHNOLOGY

POLICY AND SOCIAL CHANGE

COMPUTERS, CARS, SEDENTARY JOBS; ENERGY-DENSE FOOD AND DRINKS

PHYSICAL, ECONOMIC, SOCIOCULTURAL, POLICY

* Adapted from Swinburn et al, Obesity Reviews, 2002.
Toxic food environment: Portion size

- **Bagel**
  - Twenty Years Ago: 3-inch diameter, 140 calories
  - Today—Noah’s Plain Bagel: 5-6-inch diameter, 350 calories

- **Soda Fountain Drink Size Changes**
  - 7-11 Big Gulp (40 oz)
  - McDonald’s Large Soda (32 oz)
  - 7-11 Big Gulp (32 oz)
  - McDonald’s Large Soda (21 oz)
  - McDonald’s Large Soda (7 oz)
Toxic food environment: Calories and cost

Menu Board

<table>
<thead>
<tr>
<th>Item</th>
<th>Calories</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANDWICHES</td>
<td>280 Cal.</td>
<td>.89</td>
</tr>
<tr>
<td>HAMBURGER</td>
<td>330 Cal.</td>
<td>.99</td>
</tr>
<tr>
<td>CHEESEBURGER</td>
<td>470 Cal.</td>
<td>1.89</td>
</tr>
<tr>
<td>DOUBLE CHEESEBURGER</td>
<td>550 Cal.</td>
<td>2.89</td>
</tr>
<tr>
<td>FRIED CHICKEN SANDWICH</td>
<td>450 Cal.</td>
<td>2.89</td>
</tr>
<tr>
<td>SIDES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRIES (lg.)</td>
<td>540 Cal.</td>
<td>1.65</td>
</tr>
<tr>
<td>FRIES (sm.)</td>
<td>210 Cal.</td>
<td>1.05</td>
</tr>
<tr>
<td>ONION RINGS</td>
<td>900 Cal.</td>
<td>1.95</td>
</tr>
<tr>
<td>DRINKS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHOCOLATE SHAKE</td>
<td>770 Cal.</td>
<td>2.35</td>
</tr>
<tr>
<td>COLA (lg.)</td>
<td>330 Cal.</td>
<td>1.35</td>
</tr>
<tr>
<td>DIET COLA (lg.)</td>
<td>0 Cal.</td>
<td>1.35</td>
</tr>
</tbody>
</table>

$1 buys
- 1,200 calories
- 875 calories
- 250 calories
- 170 calories

Image of fresh produce and a menu board showing calorie and cost information for various food items.
Food environment: Eating out and prepared foods
Food environment: Convenience
Healthy hospital food environment

• Opportunity to provide healthy food for large populations:
  – 5 million employees at 5,700 U.S. hospitals
  – 36 million inpatient admissions, 118 million ER visits, and 481 outpatient visits annually

• CDC’s Healthy Hospital Choices encourages hospitals to create healthy food environments and policies

• Contributes to organizational mission and institutional culture

• Model for surrounding communities/worksites
Healthy hospital food environment: Issues to consider

• How much choice? Why not eliminate all unhealthy foods?

• Need a healthy food champion and “buy-in” from hospital leadership

• Sustainable business model- “bottom line”

• Long-term sustainability: make a healthy food policy part of accreditation?
Overview

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Traditional vs. behavioral economics

• **Traditional economics:**
  – assumes we know what is best for ourselves and act that way (i.e. rational decisions)
  – **focus**: providing information
  – basis for most public policy

• **Behavioral economics:**
  – assumes we don’t always know what is best for ourselves
  – or, if we do know, we can’t implement
  – **focus**: changing behavior
How can behavioral economics promote healthy food choices?

• Common decision errors in food choices:
  – Default/status quo
    “I always get pizza on Friday.”
  – Present-biased preferences
    “Those cookies are on sale today only.”
  – Motivation for actions with immediate benefit
    “I’ll get the French fries today and start my diet on Monday.”
  – Limitations in self-control
How can behavioral economics promote healthy food choices?

- Potential intervention strategies:
  - Point-of-purchase food/menu labels (traffic-light labels)
  - Choice architecture (product placement, default)
  - Financial incentives
  - Social norms/framing

- All strategies maintain individual choice but increase likelihood of the healthier behavior.
Traffic light labels and choice architecture to promote healthy choices in a hospital cafeteria

• We implemented a 2-phase environmental nutrition intervention in a large cafeteria to:

1) Determine if labeling all foods and beverages as red, yellow, or green would increase sales of green (healthy) items and decrease sales of red (unhealthy) items.

2) Determine if altering the “choice architecture” of the cafeteria after labeling would further increase sales of green and decrease sales of red items.
Setting: Main cafeteria, Massachusetts General Hospital (MGH)

- MGH: largest non-government employer in Boston with 23,000 employees
- The main cafeteria serves over 6,000 hospital visitors, patients, and employees every day
- Employees can pay for cafeteria purchases by direct payroll deduction using a “platinum plate” card.
Phase 1: Labeling (RYG)

- All food and beverages in the cafeteria were labeled as red, yellow, or green based on an algorithm we developed from USDA dietary guidelines.

**Green**: fresh fruits/vegetables; whole grains; or lean protein
  “Consume often”

**Yellow**: may be high in calories or saturated fat OR offer little nutritional value
  “Consume less often”

**Red**: high in calories and/or saturated fat
  “There’s a better choice in green or yellow”
Phase 2:
Labeling + Choice Architecture (CA)

• Implemented after Phase 1

• “Choice architecture” intervention
  – Make healthy foods (green) more convenient/visible
  – Make unhealthy foods (red) less convenient/visible

• Changes were made over a weekend and not advertised to cafeteria patrons
Before Choice Architecture
After Choice Architecture
Water bottles everywhere
Sales of all cafeteria items during baseline, Phase 1, and Phase 2

Sales of cold beverages during baseline, Phase 1, and Phase 2

Sales of bottled water and soda during baseline, Phase 1, and Phase 2

Beverage purchases by employee race
(N=4,652)

B = Baseline     L = Labeling (Phase 1)     C = Choice architecture (Phase 2)

Beverage purchases by employee job type (N=4,652)

B = Baseline           L = Labeling (Phase 1)          C = Choice architecture (Phase 2)

Customers who noticed labels were more likely to purchase healthier items

This study was conducted at Massachusetts General Hospital in Boston, Massachusetts (2010).  
*** P value <0.001 for comparison of the proportion of red, yellow, and green (RYG) purchases.  
a All respondents.  
b Respondents who reported that they had noticed RYG labels at the time of purchase.

Cafeteria beverage purchases over 2 years

% of beverage purchases

Red beverages
Yellow beverages
Green beverages

BASELINE (3 months)
RYG (3 months)
RYG + CA (21 months)

54% 27%
59%* 19%*
60%* 18%*

*P<.001 for comparison to baseline

Change in beverage purchases by longitudinal cohort of employees over 2 years (N=2,285)

## MGH cafeteria sales remained stable over 2 years

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>12-month F/U</th>
<th>24-month F/U</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall daily cafeteria revenue (mean)</strong></td>
<td>$31,289</td>
<td>$34,631</td>
<td>$32,647</td>
</tr>
<tr>
<td><strong>Daily beverage revenue (mean)</strong></td>
<td>$4,350</td>
<td>$4,860</td>
<td>$4,489</td>
</tr>
<tr>
<td><strong>Number of daily transactions (mean)</strong></td>
<td>6,511</td>
<td>7,136</td>
<td>6,688</td>
</tr>
<tr>
<td><strong>Amount spent per transaction (mean)</strong></td>
<td>$4.81</td>
<td>$4.85</td>
<td>$4.88</td>
</tr>
</tbody>
</table>

Exploring new strategies: Financial incentives and social norms

• **Financial incentives**
  – changing the price of food can be effective, at least in the short-term
  – some evidence that offering “cash back” or rebate programs in grocery stores increases healthy food purchases

• **Social norms**
  – currently being used to promote energy conservation
    • “Home Energy Report”
  – small experimental studies suggest food choices can be influenced by social normative messages
**Home energy report**
Account number: 5163023411
Report period: 11/15/11–12/15/11

We are pleased to provide you periodic, personalized Home Energy Reports as part of a National Grid initiative. These reports are designed to provide you more information to make informed energy choices to help you save energy and money.

If you have any questions about these reports or would like to no longer receive them, you can contact us at (877) 313-8803.

Update your home information at: nationalgridus.com/energyreports

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**Last Month Neighbor Comparison**
You used **23% LESS** natural gas than your efficient neighbors.

<table>
<thead>
<tr>
<th></th>
<th>YOU</th>
<th>Efficient Neighbors</th>
<th>All Neighbors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>199Therm*</td>
<td>259</td>
<td>362</td>
</tr>
</tbody>
</table>

*Therm: Standard unit of measuring heat energy

- **All Neighbors**: Approximately 100 occupied nearby homes that are similar in size to yours (avg 6,100 sq ft) and have gas heat
- **Efficient Neighbors**: The most efficient 20 percent from the "All Neighbors" group

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**Personal Comparison**

How you're doing compared to last year:

<table>
<thead>
<tr>
<th></th>
<th>YOU JAN - NOV 2010</th>
<th>YOU JAN - NOV 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,480 Therm*</td>
<td>2,272 Therm*</td>
</tr>
</tbody>
</table>

So far this year, you used **9% LESS**

natural gas than last year.

⭐ You're on pace to use less in 2011.

Looking for ways to save even more? Visit www.nationalgridus.com/energyreports

*Therm: Standard unit of measuring heat energy
“Social norm” feedback and financial incentives to promote employees’ healthy food choices

**Objective:** test an employer-based intervention using social norm (peer comparison) feedback with or without financial incentives to promote healthy food choices.

Randomized controlled trial comparing:

1) monthly “social norm” feedback about healthy cafeteria purchases (**feedback only**)
2) monthly social norm feedback + small financial incentive (**feedback-incentive**)
3) no feedback/incentive (**control**)
5073 employees (≥ 1 cafeteria purchase July/Aug. 2012)

2741 eligible (3 purchases/month)

2672 randomized

870 control
877 feedback-only
925 feedback-incentive

3 MONTHS (Oct.-Dec. 2012)

No contact

Monthly letters

Wash-out period (no contact)

3 MONTHS (Jan.-Mar. 2013)

858 Analyzed
12 Excluded
6 no purchases
1 leave of absence
4 no longer employed
1 active drop-out

853 Analyzed
24 Excluded
3 no purchases
6 no longer employed
5 active drop-outs
10 incorrect address

898 Analyzed
27 Excluded
8 no purchases
2 no longer employed
6 active drop-outs
11 incorrect address
Intervention Arm: Feedback only

- Monthly letters Oct, Nov, and Dec 2012
- Individual feedback
- Peer-comparison feedback to “all” MGH employees and to MGH “healthiest eaters”
Intervention Arm: Feedback + incentive

- Monthly letters Oct, Nov, and Dec 2012
- Same as feedback arm plus “green goal” to achieve threshold of 40%, 60%, or 80% green
- Reward: money applied to cafeteria card ($10 to pass each threshold, $5 for maintaining)
**Results**

Baseline characteristics of employees

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Feedback-only</th>
<th>Feedback-Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female</strong></td>
<td>73%</td>
<td>73%</td>
<td>72%</td>
</tr>
<tr>
<td><strong>Age group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-30 years</td>
<td>24%</td>
<td>23%</td>
<td>21%</td>
</tr>
<tr>
<td>31-40 years</td>
<td>28%</td>
<td>28%</td>
<td>29%</td>
</tr>
<tr>
<td>41-50 years</td>
<td>21%</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>51 years and over</td>
<td>26%</td>
<td>24%</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black/African- American</td>
<td>12%</td>
<td>10%</td>
<td>9%</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>8%</td>
<td>8%</td>
<td>7%</td>
</tr>
<tr>
<td>Asian</td>
<td>5%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>White</td>
<td>73%</td>
<td>69%</td>
<td>72%</td>
</tr>
</tbody>
</table>
## Results

Baseline purchasing patterns of employees

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Feedback only</th>
<th>Feedback + Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of purchases that are green</td>
<td>49%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Proportion of purchases that are red</td>
<td>17%</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>Visits to cafeteria per month (mean)</td>
<td>12.0</td>
<td>12.1</td>
<td>12.5</td>
</tr>
<tr>
<td>Amount spent in cafeteria per month (mean)</td>
<td>$56.85</td>
<td>$56.73</td>
<td>$59.78</td>
</tr>
</tbody>
</table>
Overview

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Summary

• Traffic-light labels and choice architecture increased healthy food choices over 2 years, suggesting “fatigue” does not develop.

• Social norm feedback plus small incentives improved healthy choices by employees over 3 months.

• Relatively “light touch” interventions result in a significant shift toward healthier food choices among a population who had not sought out a healthy eating or wellness program.
Conclusions and Next Steps

- These strategies have potential to be implemented in other worksite, institutional, and retail settings at relatively low cost using existing payment or loyalty card infrastructure.

- Next steps will be to examine the effectiveness of these interventions in improving employees’ health outcomes, such as weight and cardiovascular risk factors.
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References


References (cont’d)


