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Ethnic and Gender Differences in Ideal Body Size and Related Attitudes among Asians, Native Hawaiians, and Whites

Claire Townsend MPH; Julie Y. Takishima-Lacasa MA; Janet D. Latner PhD; Andrew Grandinetti PhD; and Joseph Keawe’aimoku Kaholokula PhD

Abstract

Often overlooked explanations for the varied obesity rates across ethno-cultural groups include differences in attitudes toward excess weight, with certain populations assumed to have larger ideal body sizes (IBS). Past studies found ethnic and gender differences in IBS across and within different groups. This study examined the effects of ethnicity and gender, and their interaction, in accounting for differences in IBS and attitudes toward those ideals. Multiple regression analyses were used to better understand the effects of ethnicity and gender in accounting for differences in perceived IBS according to ethnic-specific and Western ideals and attitudes in 1,124 people of Native Hawaiian, Filipino, Japanese, and White ancestry. The analyses controlled for socio-demographics, body mass index, health-related behaviors, and psychosocial variables. The results indicated that Native Hawaiians selected larger ethnic IBS, Filipinos selected smaller ethnic IBS, and Native Hawaiians selected slightly smaller Western IBS than other ethnic groups. Overall, males selected larger IBS compared to females. Interaction analyses indicated that the relationship between ethnic IBS and attitude toward that IBS varied as a function of ethnicity, such that Native Hawaiians who selected a larger ethnic IBS held less favorable attitudes toward that IBS. The discrepancy between Native Hawaiians’ selection of larger ethnic IBS as ideal and their less positive attitude toward that selection warrants more investigation. However, it does suggest that Native Hawaiians, on a personal level, do not prefer larger body sizes, which contradicts their perceptions of social norms. These findings have important implications for obesity interventions among Native Hawaiians.

Keywords
ideal body size, ethnicity, gender, Filipinos, Native Hawaiians, attitudes

Introduction

Ethno-cultural differences in attitudes and preferences that people hold toward body size are often overlooked possible explanations for the observed ethno-cultural group variations in prevalence of overweight and obesity. Some of the differences in attitudes toward larger body sizes across ethno-cultural groups have been theorized to be rooted in differences in beauty ideals and perception of weight, with certain populations having positive perceptions of larger body sizes. Research from the 1980s and 1990s found that certain ethno-cultural groups associate large body sizes with marriageability, attractiveness, fertility, and generosity. Becker, et al., reported that, traditionally, some Pacific Islanders associate power and status with large body sizes. In New Zealand, Metcalf, et al., found that Pacific Islanders with higher BMIs, compared to Whites with higher BMIs, were more likely to see themselves as either under or normal weight.

Gender differences have also been observed, women report more body dissatisfaction and a preference toward smaller IBS than men. Craig, et al., found that White Australian and Tongan men selected larger ideal attractive female body sizes than their women counterparts. A 2007 study found that females, compared to males, selected smaller IBS regardless of ethnicity. Miller and Halberstadt found that New Zealand women, but not men, selected significantly smaller IBS compared to their perceived actual body size.

Rationale for Present Study

There is a dearth of research that has examined IBS in Native Hawaiians, despite assumptions that they may have a larger IBS. Therefore, this study examined the IBS endorsed by Native Hawaiians in comparison to three other ethnic groups, Filipinos, Japanese, and Whites, residing in Hawai‘i, and their attitudes towards their selections. Specifically, this study examined the differences in perceptions of, and attitudes towards, IBS while controlling for socio-demographics, BMI, dietary and physical activity indicators, and psychosocial variables that may serve as confounders, as suggested by previous studies. The influence of both their ethnic culture and the US mainstream society may lead people to hold different opinions of IBS, based on which social group serves as their reference point. The degree of influence these social groups have over peoples’ preferred body size may differ across, and by gender, within ethnic groups. It was hypothesized that there would be large ethnic differences in the body size endorsed as the ethnic group’s ideal but not in the body size endorsed as the Western ideal; that ethnic groups who select larger ethno-cultural IBS would hold less favorable attitudes toward that selection; and that across ethnic groups, women would select smaller IBS than men.

Methods

Participants

Cross-sectional data from the Kohala Health Research (KHR) Project (formerly known as the Native Hawaiian Health Research Project) were analyzed for this study. The KHR Project was a community-based epidemiological study of diabetes and cardiovascular risk factors among adult residents of the North Kohala district on the island of Hawai‘i. Data from 1,124 individuals (617 females and 507 males) were included in this study and their ethnic breakdown is as follows: 494 (44.0%) Native Hawaiians, 186 (16.5%) Filipinos, 190 (16.9%) Japanese, and 254 (22.6%) Whites. Table 1 summarizes the socio-demographic characteristics of the participants by ethnic groups and combined group.
Measures

*Modified Body Image Questionnaire (MBIQ).* The 24 figures created by Furnham and Baguma, and demonstrated as appropriate for the cross-cultural assessment of body image, were used.16-18 Twelve female and 12 male figure drawings were shown ranging from slim (extreme endomorph) to obese (extreme ectomorph), and participants were asked to select the picture they saw as the ideal body image for their gender according to Western culture (referred to as Western IBS) and the picture they saw as the ideal body image according to their ethnic group (referred to as ethnic IBS). These items yielded scores ranging from 1 to 12 with higher scores indicating a larger body size. Respondents were then asked, “How do you feel about the image you have chosen above?” and instructed to rate their attitudes towards their selection using a 5-point rating scale, ranging from 1 (“Very Negative”) to 5 (“Very Positive”).

Socio-demographics. Information on gender, age, educational attainment, marital status, and self-reported ethnic ancestry was collected using a personal history data form. For the purposes of the present study, a Native Hawaiian was defined as any individual who is a descendant of persons residing in the Hawaiian Islands prior to Western contact in 1778.19 All those who reported any Native Hawaiian ancestry were included as Native Hawaiians in this study. All others were classified as Caucasian, Filipino, or Japanese and included in this study, if they reported only that particular ancestry.

Health-related Variables. Clinical and health-related behavioral data were collected using several methods. Participants’ height and weight were taken according to standardized protocols, from which body mass index (BMI) was calculated.20 Participants’ physical activity level, measured in weekly average metabolic equivalents (METs), was based on participants’ self-report using the Pima Indian Physical Activity Questionnaire, adapted for Hawai‘i.21 Higher weekly average METs indicates a greater amount of energy expenditure. Daily caloric intake (Kcal) was estimated using a semi-quantitative Food Frequency Questionnaire.
naire developed by the Cancer Research Center of Hawai‘i that assessed the average intake of 166 foods and beverages within the prior week.22

Psychosocial Variables. The Center for Epidemiological Studies – Depression scale (CES-D) was used to measure depression symptoms.23 The CES-D is a 20-item self-report measure of cognitive, affective, and behavioral symptoms of depression. Respondents are asked to rate the frequency of symptoms experienced in the last week on a 4-point scale from rarely or none of the time (0) to most or all of the time (3). CES-D scores range from 0 to 60, with higher scores indicating greater frequency of depressive symptoms. The use of the CES-D as a reliable and valid measure of depression symptoms has been supported among different ethnic groups, including those of interest in the present study.19,23,24

Ethnic and Western identity were assessed using an 8-item cultural affiliation questionnaire designed for the KHR Project.25 It assesses cognitive/attitudinal factors of ethnic and Western identity by measuring the degree of identity/affiliation with, feelings toward, and knowledge about each cultural group and the impact each cultural group has on their preferred lifestyle. The questionnaire is comprised of two subscales: an ethnic identity subscale (4 items) and a Western-US identity subscale (4 items). Each item has a 5-point response scale ranging from 1 (very knowledgeable or very positive) to 5 (not knowledgeable at all or very negative). The total scores on each subscale range from 4 to 20, with lower scores on each subscale indicating higher levels of affiliation and identification with that cultural group. This identity scale has been used in previous studies of Native Hawaiians and Cronbach’s α of 0.72, suggesting acceptable reliability, have been reported for each subscale.26

The socio-demographic variables, other than ethnicity and gender, were control variables for this study because of their potential confounding effects. Educational attainment was used as an indicator of SES, given that education has been shown to have a stronger and more consistent relationship to health than income or occupation.13 Depressive symptoms have been associated with perceptions and attitudes toward body image in other studies, and were included as a control variable in the present study.12 Large ethnic differences in depression have also been reported in Hawai‘i, with Native Hawaiians having the highest prevalence.13 Both ethnic and Western cultural identities were examined as control variables because degree of acculturation has been associated with body image in previous studies and because degree of acculturation varies across and within ethnic groups in Hawai‘i.15,25,26 This helped to ensure that any ethnic differences observed in the present study were not better explained by these other demographic and psychosocial factors.

Procedures
The KHR Project’s design and methods have been described in detail elsewhere.26 Briefly, participants of the KHR Project were recruited via telephone using a cross-reference directory, local public television announcements, flyers posted at community centers and stores, and presentations given to community organizations. Eligibility criteria included: ≥ 18 years of age, a resident of North Kohala, Hawai‘i, and if female, not pregnant at the time of the study. Following informed consent, participants underwent a 2-hour clinical examination and interview at a community clinic. A $20 gift certificate was given to each participant upon completion of exam and interview.

Data Reduction and Statistical Analyses
The categorical variables of gender (1 = male; 2 = female), educational attainment (1 = no high school diploma or its equivalent; 2 = high school diploma or its equivalent; 3 = some college, technical, or vocational training; or 4 = college graduate), and marital status (1 = never married; 2 = currently married; or 3 = disrupted marital status) were dummy coded for all analyses. The separated/divorced and widowed marital statuses were aggregated and will be subsequently referred to as “disrupted marital status.”

Analyses were conducted using JMP Statistical Software (version 9.0.2) with an alpha level of .05. Chi-square (χ²) analysis or analysis of variance (ANOVA) was conducted. As differences between ethnic groups were found, a Tukey-Kramer HSD post-hoc analysis was done to further elucidate what ethnic groups, specifically, differed from each other on each of the study variables. Multiple regression analyses were then carried out to examine the association of ethnicity, gender, and IBS attitude scores (independent variables) with ethnic and Western IBS scores (dependent variables), separately, while controlling for the effects of socio-demographics (age, education, and marital status), BMI and health-related behavioral indicators (Kcal intake and METs), and psychosocial variables (IBS attitude scores, CES-D scores, and identity scores). To examine the interaction effects among ethnicity, gender, and attitude scores on ethnic and Western IBS scores, further multiple regression analyses were run, separately, with their main effects, their two-way interaction terms, and the control variables. Only the variables found to have a significant association with IBS scores in the previous multiple regression analyses were included in these interaction analyses.

Results
Bivariate Ethnic Comparisons
Data on participants’ characteristics by ethnic group and their between-ethnic group bivariate analyses are presented in Table 1. Native Hawaiians were significantly younger in age and less likely to have more than a high school education, whereas the inverse was true for Japanese. Compared to the other ethnic groups, Native Hawaiians had a significantly higher average BMI and Kcal intake, Filipinos had significantly lower METs and Japanese had significantly lower mean CES-D scores. Additionally, Native Hawaiians were significantly more likely to endorse a larger body size as their ethnic ideal compared to the other ethnic groups, but the opposite was true for Filipinos. Filipino participants’ ethnic identity scores were significantly

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higher than those for Native Hawaiians, Japanese, and Caucasians, with Caucasians reporting the lowest. Filipino and Native Hawaiian participants’ Western identity scores were significantly lower than the scores for Caucasians and Japanese.

**Bivariate Gender Comparisons by Ethnic Group**

Data on participants’ characteristics by gender across ethnic groups and their between-gender bivariate analyses by ethnicity are presented in Table 2. Across all ethnic groups, males had significantly higher Kcal intake, METs, and Western body size scores than females. Ethnic IBS scores were significantly higher among male than female Filipinos, Japanese, and Native Hawaiians. Japanese males had significantly higher ethnic IBS attitude scores than their female counterparts. Significant gender differences for Western IBS attitude scores were observed for Japanese, Native Hawaiians, and Whites, with males having higher scores.

**Multiple Regression Analyses**

Because significant between-ethnic group differences in ethnic IBS scores (Table 1) and significant gender differences within ethnic groups in Western IBS scores were found (Table 2), their effects in predicting ethnic and Western IBS scores, were further examined, separately, in multiple regression models while controlling for socio-demographics, BMI, Kcal intake, METs, and the psychosocial variables. The results of these analyses are summarized in Table 3.

**Ethnic Ideal Body Size.** Controlling for the aforementioned variables, the effects of ethnicity ($F=23.08$, $P<.001$), gender ($F=17.16$, $P<.001$), and ethnic IBS attitude scores ($F=7.54$, $P<.01$) were significantly associated with ethnic IBS scores. Compared to Whites, Native Hawaiians selected a larger body size as their ethnic IBS ($t=6.65$, $P<.001$), whereas the inverse was true for Filipinos ($t=-6.36$, $P<.001$). Males, compared to females, selected a larger body size as their ethnic IBS ($t=4.14$, $P<.001$). Participants who selected larger ethnic IBS had less favorable attitudes toward their selection ($t=-2.75$, $P<.01$). Of the control variables, participants with a younger age ($t=-2.51$, $P<.05$) and a higher BMI ($t=2.62$, $P<.01$) and Kcal intake ($t=2.83$, $P<.01$) selected a larger ethnic IBS.

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**Table 2. Participants’ Characteristics by Gender Across Ethnic Groups and Bivariate Analyses of Between-gender Differences Within Ethnic Groups**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Filipinos (n=186)</th>
<th>Japanese (n=190)</th>
<th>Native Hawaiians (n=494)</th>
<th>Whites (n=254)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male (n=72)</td>
<td>Female (n=114)</td>
<td>Male (n=93)</td>
<td>Female (n=224)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Male (n=270)</td>
<td>Female (n=270)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Male (n=118)</td>
<td>Female (n=136)</td>
</tr>
<tr>
<td><strong>Educational attainment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than H.S.</td>
<td>20 (27.7)</td>
<td>47 (41.2)</td>
<td>12 (12.9)</td>
<td>13 (13.4)</td>
</tr>
<tr>
<td>H.S. graduate</td>
<td>25 (34.7)</td>
<td>38 (33.4)</td>
<td>45 (48.4)</td>
<td>47 (48.5)</td>
</tr>
<tr>
<td>Some college</td>
<td>17 (23.6)</td>
<td>16 (14.0)</td>
<td>19 (20.4)</td>
<td>20 (20.6)</td>
</tr>
<tr>
<td>College graduate</td>
<td>10 (14.0)</td>
<td>13 (11.4)</td>
<td>17 (18.3)</td>
<td>17 (17.5)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never married</td>
<td>10 (14.1)</td>
<td>11 (9.6)</td>
<td>19 (20.4)</td>
<td>6 (6.2)</td>
</tr>
<tr>
<td>Currently married</td>
<td>53 (74.6)</td>
<td>76 (66.7)</td>
<td>63 (67.9)</td>
<td>69 (71.1)</td>
</tr>
<tr>
<td>Disrupted marital status</td>
<td>8 (11.3)</td>
<td>27 (23.7)</td>
<td>11 (11.8)</td>
<td>22 (22.7)</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td>54.5 ± 18.3</td>
<td>53.2 ± 14.8</td>
<td>58.3 ± 15.4</td>
<td>44.4 ± 15.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>44.3 ± 14.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>48.5 ± 16.8</td>
</tr>
<tr>
<td><strong>Body mass index (BMI)</strong></td>
<td>27.0 ± 5.5</td>
<td>25.6 ± 5.6</td>
<td>26.1 ± 3.1</td>
<td>25.4 ± 4.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30.8 ± 6.7</td>
</tr>
<tr>
<td><strong>Kilocalories (Kcal)</strong></td>
<td>2757.7 ± 1555.9</td>
<td>2124.1 ± 1818.0</td>
<td>2353.3 ± 762.1</td>
<td>1903.8 ± 680.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3165.6 ± 1326.4</td>
</tr>
<tr>
<td><strong>Physical Activity (METs)</strong></td>
<td>31.7 ± 32.1</td>
<td>19.3 ± 21.8*</td>
<td>38.8 ± 42.0</td>
<td>23.0 ± 28.4*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50.2 ± 60.6</td>
</tr>
<tr>
<td><strong>CES-D score</strong></td>
<td>7.3 ± 5.6</td>
<td>7.9 ± 7.0</td>
<td>5.1 ± 5.7</td>
<td>5.4 ± 5.2</td>
</tr>
<tr>
<td><strong>Ethnic identity score</strong></td>
<td>7.0 ± 2.4</td>
<td>6.6 ± 2.3</td>
<td>8.1 ± 2.4</td>
<td>7.7 ± 2.3</td>
</tr>
<tr>
<td><strong>Western identity score</strong></td>
<td>9.9 ± 3.0</td>
<td>9.9 ± 3.1</td>
<td>9.1 ± 2.4</td>
<td>8.9 ± 2.5</td>
</tr>
<tr>
<td><strong>Ethnic IBS score</strong></td>
<td>5.7 ± 2.1</td>
<td>4.9 ± 1.8*</td>
<td>6.0 ± 1.7</td>
<td>5.5 ± 1.6*</td>
</tr>
<tr>
<td><strong>Western IBS score</strong></td>
<td>6.2 ± 1.9</td>
<td>5.5 ± 2.0*</td>
<td>6.1 ± 1.6</td>
<td>5.6 ± 6.7*</td>
</tr>
<tr>
<td><strong>Ethnic IBS attitude score</strong></td>
<td>3.9 ± 0.9</td>
<td>3.8 ± 0.9</td>
<td>3.9 ± 0.7</td>
<td>3.5 ± 0.8*</td>
</tr>
<tr>
<td><strong>Western IBS attitude score</strong></td>
<td>3.7 ± 0.9</td>
<td>3.6 ± 0.9</td>
<td>3.8 ± 0.8</td>
<td>3.4 ± 0.9**</td>
</tr>
</tbody>
</table>

Data presented as n (%) or as mean ± standard deviation. Due to missing data, some of the variables totals may not add to the correct column n. MET = Metabolic Equivalent Task. IBS = Ideal body size. Chi-square analysis was used to evaluate the association between gender and categorical variables and analysis of variance (ANOVA) to evaluate differences between ethnic group means and continuous variables. $^* P<.05$, $^P<.001$, $^P<.001$
Table 3. Multiple Regression Analysis Predicting Ethnic and Western Ideal Body Size Scores, Separately, while Controlling for Socio-Demographics, BMI and Health-related Behavioral Indicators, and Psychosocial Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Ethnic Ideal Body Size</th>
<th>Western Ideal Body Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$[R^2 = .17; F(15, 984) = 12.99, P &lt; .001]$</td>
<td>$[R^2 = .08; F(15, 1064) = 5.67, P &lt; .001]$</td>
</tr>
<tr>
<td></td>
<td>$B$</td>
<td>$SE$</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filipino</td>
<td>-0.77</td>
<td>0.12</td>
</tr>
<tr>
<td>Japanese</td>
<td>-0.14</td>
<td>0.12</td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>0.65</td>
<td>0.10</td>
</tr>
<tr>
<td>White (ref.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0.25</td>
<td>0.06</td>
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<tr>
<td>Female (ref.)</td>
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<td></td>
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<tr>
<td>IBS Attitude scores</td>
<td>-0.19</td>
<td>0.07</td>
</tr>
<tr>
<td>Control Variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>-0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Education level</td>
<td>-0.04</td>
<td>0.08</td>
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<td>Marital status</td>
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<tr>
<td>Never married</td>
<td>0.05</td>
<td>0.12</td>
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<tr>
<td>Currently married</td>
<td>0.01</td>
<td>0.08</td>
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<tr>
<td>Disrupted marriage (ref.)</td>
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IBS = ideal body size. Ethnic IBS attitude scores were included in predicting ethnic IBS while Western IBS attitude scores were included in predicting Western IBS. *P < .05, †P < .001, ‡P < .001

Western Ideal Body Size. Controlling for the aforementioned variables, the effects of ethnicity ($F = 2.63, P < .05$) and gender ($F = 16.01, P < .001$) were significantly and independently associated with Western IBS scores. Native Hawaiians selected a smaller body size as the Western IBS than Whites ($t = -2.50, P < .05$). No differences were found between Whites and Filipinos or Japanese. Males selected a larger body size than females as their Western ideal ($t = 4.00, P < .001$). Of the control variables, participants with a younger age ($t = -1.97, P < .05$) and a higher Kcal intake ($t = 4.30, P < .001$) selected a larger Western IBS.

Interaction Analyses

Because significant ethnic and gender effects were found in the previous regression analyses (see Table 3), their interaction effects on ethnic and Western IBS scores were further examined, separately. The two-way interactions among ethnicity, gender, and attitude scores on ethnic IBS scores were considered, controlling for age, BMI, and Kcal intake because of their significant bivariate correlations with ethnic IBS. The two-way interaction with ethnicity and gender on Western IBS scores did not include the effects of the attitude scores. This analysis controlled for age and Kcal intake. The results of these regression analyses are summarized in Table 4.

Ethnic Ideal Body Size. Controlling for age, BMI, and Kcal intake and the main effects of ethnicity, gender, and attitude scores, significant two-way interaction effects of ethnicity and attitude scores ($F = 3.47, P < .05$) and of gender and attitude scores ($F = 4.66, P < .05$) on ethnic IBS scores were found. Although the overall interaction effect of ethnicity and attitude scores were significant, a significant interaction ($t = 3.22, P < .01$) was only evident for Native Hawaiian participants, among whom those who selected a larger ethnic IBS had a less favorable attitude toward their selection than the other three ethnic groups.

Western Ideal Body Size. Controlling for age and Kcal intake and the main effects of ethnicity and gender, the two-way interaction effect for ethnicity and gender ($F = 0.19, P = .91$) on Western IBS scores was not significant. A significant main effect was found for gender ($F = 19.55, P < .001$) but not for ethnicity ($F = 2.28, P = .08$) with the inclusion of their interaction term and control variables as shown in Table 3.
Discussion

In terms of ethno-cultural ideal body size (IBS), Native Hawaiians selected considerably larger IBS, and Filipinos selected considerably smaller IBS, compared to Japanese and Whites. Native Hawaiians selected slightly smaller Western IBS compared to the other ethnic groups, which remained significant after inclusion of the control variables. Findings of the present study indicate ethnic differences both in perceived ethnic and Western IBS. However, there was less variability across ethnic groups in perceived Western IBS. Additionally, regardless of ethnicity, participants who selected smaller body sizes as their ethnic ideal had more favorable attitudes toward their selection compared to those who chose larger body sizes. However, among Native Hawaiians, larger ethnic IBS selection was associated with more negative attitudes about the selection. For Western IBS, there was no significant association between participants’ size selection and attitudes toward that selection.

The findings concerning men’s versus women’s IBS are consistent with the findings of past studies. Across ethnic groups, males were more likely than females to select larger body sizes when considering both their ethnic group’s perceived norms and perceived Western norms. This included Filipino men, which is in contrast to the only other study of IBS in Filipinos in which Filipino men followed a more characteristically female pattern of smaller IBS. An ethnicity by gender interaction was not found, suggesting a similar gender pattern in IBS regardless of ethnicity. There were significant differences in ethnic IBS selection and attitudes toward that selection as a function of

Only the variables found to have a significant independent effect in the previous regression analyses were included here. IBS = ideal body size. Ethnic IBS attitude scores were included in predicting ethnic IBS while Western IBS attitude scores were included in predicting Western IBS. *P < .05, †P < .001, ‡P < .001

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<td>[R²=.08; F(15,1064) = 5.67, P &lt; .001]</td>
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<td>SE B</td>
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gender. Regardless of ethnicity, men, but not women, who selected larger ethnic IBS had less favorable attitudes toward that selection. This gender difference was stronger for Filipinos than for the other three ethnic groups.

Possible explanations for why Native Hawaiians perceive larger body sizes as their ethnic group’s ideal, despite having less favorable personal attitudes toward them, may be related to their assumptions regarding an ethnically-driven genetic component of obesity (i.e., a genetic predisposition) or discrepancies between their personal and perceived ethnic group’s acceptance of body size stereotypes. It has also been proposed that cultural values play a role: although Pacific Islanders have historically considered large body size a sign of wealth or royalty, it may be that the juxtaposition of that cultural value with Western body size ideals, varying knowledge regarding health risks of obesity, and the variable assimilation of those conflicting standards into one’s personal values result in an unresolved paradox. More research is needed to clarify why Native Hawaiians believe that a larger body size is preferred by their ethnic group, even when they may not personally favor that ideal body size.

Filipinos in our study tended to select a thinner body size as their ethnic ideal, even after controlling for the influence of socio-demographics, BMI, overall energy intake and expenditure, and the selected psychosocial variables. Filipino men, like men of the other ethnic groups, were more likely to select larger ideal body sizes compared to their female counterparts, in contrast to the only other study of ideal body size in Filipinos. It is important to note that BMI did not account for the observed ethnic differences in ideal body size selection. It stands to reason that the selection of ideal body size be proportionate to a person’s actual body size (i.e., BMI), as observed in some studies. However, this was not the case in our study.

The socio-demographic differences and differences in BMI, energy intake and expenditure, cultural identification, and psychological well-being did not account for the observed ethnic differences in our study. This suggests that other factors related to ethnicity may better explain the ethnic differences in the participants’ perceptions of their IBS. The smaller ethnic variation in the selection of Western IBS, compared to their ethnic IBS, suggests a shared notion of what constitutes the IBS according to Western expectations. This is not surprising given that all participants are probably heavily exposed to factors that shape this perception, such as television and other media that portray thinner body sizes as desirable.

Native Hawaiians were the only ethnic group in this study to have significant discrepancies between what they believe to be their ethnic ideal body size and their personal preference for that perceived body size. Specifically, the larger the perceived “ideal” Native Hawaiian body size, the more negative their attitude was towards that body size. These findings are somewhat congruent with other studies of Native Hawaiians and of other Polynesian groups regarding personal preferences for smaller body sizes. Collectively, these findings appear to counter the notion that Polynesians have a personal preference for larger body sizes. Although they may perceive their own ethnic group as having a larger ideal body size preference, perhaps influenced by stereotypes of them held by non-Polynesians, they do not appear to personally share that same perceived preference.

These findings should be interpreted in the context of this study’s limitations. The generalizability of these findings may be limited by the study’s population. All participants were residents of the North Kohala district on Hawai’i island. Ethnic and Western IBS may vary across the locations, for instance due to differing dietary and activity patterns as well as differing levels of Westernization. Although the figures used here have been widely utilized in the body image research literature, there are other measures available for use. However, line drawings were chosen for the present study because they are culturally neutral and figure ratings scales have not been developed to represent a Native Hawaiian population. Despite this potential limitation, the authors were able to detect significant relationships between IBS, ethnicity, and gender, suggesting that the MBIQ adequately assessed IBS. In addition to the variables controlled for in this study, there may be other variables that are important in understanding the relationship between ethnicity and IBS. Finally, because ethnicity is most likely a marker for other variables, it is important to identify the mediators of the relationship between ethnicity and body size ideals, such as the influence of stereotypes and body sizes of participants’ peers and family members.

Given the higher prevalence of obesity and related medical conditions in the ethnic groups examined in this study, the findings are instructive to our understanding of obesity and weight management in these groups. As previous research has suggested, personal and perceived cultural ideals for body shape may carry important implications for health care providers designing culturally-informed behavioral health interventions and health education campaigns. For instance, Native Hawaiians have a high prevalence of obesity, and it is well established that obesity is a significant risk factor for diseases, such as diabetes and hypertension. The finding that Native Hawaiians believe that their cultural group values a larger body size that conflicts with their personal ideals clearly provides insight into this issue and should inform attempts to address their health disparities. Further, our findings also provide evidence for employing a culturally-minded approach in assessing the individual’s ideal body shape as well as perceptions of ideal body image according to ethnic culture—knowledge that could inform collaboratively-set weight loss goals in weight management interventions. These inferences have social significance in terms of public policy that guide health education campaigns, for example, in utilizing more accurate depictions and role-modeling of cultural body types in brochures or other visual media so as to displace rather than perpetuate inaccurate stereotypes.

Future research should explore additional psychosocial and socio-cultural factors, i.e., culturally-driven beliefs about health and weight, to further explicate the interrelated dynamics that influence differences in body size ideals between ethnic groups. Focus group research may help elucidate influencing factors and generate ideas for culturally-specific etiologies of
IBS. Moreover, it may be instructive to examine interactions between acculturation status and personal body shape preferences or perceived ethno-cultural body size ideals. Longitudinal studies might clarify how changes in BMI and acculturation status might lead to changes in IBS preferences over time.

Conflict of Interest
None of the authors identify a conflict of interest.

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References
Social Justice in Medical Education: Strengths and Challenges of a Student-Driven Social Justice Curriculum

Adrian Jacques H. Ambrose MD; January M. Andaya MS; Seiji Yamada MD, MPH; and Gregory G. Maskarinec PhD

Abstract
In the current rapidly evolving healthcare environment of the United States, social justice programs in pre-medical and medical education are needed to cultivate socially conscious and health professionals inclined to interdisciplinary collaborations. To address ongoing healthcare inequalities, medical education must help medical students to become physicians skilled not only in the biomedical management of diseases, but also in identifying and addressing social and structural determinants of the patients’ daily lives. Using a longitudinal Problem-Based Learning (PBL) methodology, the medical students and faculty advisers at the University of Hawai‘i John A. Burns School of Medicine (JABSOM) developed the Social Justice Curriculum Program (SJCP) to supplement the biomedical curriculum. The SJCP consists of three components: (1) active self-directed learning and didactics, (2) implementation and action, and (3) self-reflection and personal growth. The purpose of introducing a student-driven SJ curriculum is to expose the students to various components of SJ in health and medicine, and maximize engagement by using their own inputs for content and design. It is our hope that the SJCP will serve as a logistic and research-oriented model for future student-driven SJ programs that respond to global health inequalities by cultivating skills and interest in leadership and community service.

Introduction
Importance of Social Justice Education in Medicine
According to the World Health Organization (WHO), social justice (SJ) begins by recognizing that (1) health is a fundamental human right, and (2) gross inequalities in health care are politically, socially, and economically unacceptable.1 SJ education, incorporating interdisciplinary knowledge and encouraging social, political, and biomedical collaboration, helps medical students become socially conscious and acquire the skills to deliver competent health care to all individuals within a community.2 As one of the core principles in the American Board of Internal Medicine’s Charter on Medical Professionalism, the Principle of Social Justice delineates an intrinsic responsibility for medical professionals to “promote justice in the health care system, including the fair distribution of health care resources.”3 Similarly, the Carnegie Foundation in 2010 recommended an integrative learning experience that combines “basic, clinical, and social sciences” while incorporating “interprofessional education and teamwork.”4 Given the persistence of health inequalities in contemporary society, educational interventions, such as those to recognize social determinants of health (SDH) in clinical practices, are needed in medical and pre-medical curricula for a socially just future in health.5 To address health disparities effectively, medical education must go beyond skills, knowledge, and attitudes to foster critical awareness or consciousness of oneself and others.6 According to a report of the WHO Commission on the Social Determinants of Health, medical education must also address issues of social relevance in health care, such as the social determinants of health, not just theoretically but also in clinical context.7 To address ongoing healthcare disparities, medical education must help medical students to become physicians who are not only skilled in diagnosis and management of diseases, but also in assessing and intervening in the social and structural determinants of the patients’ daily lives. However, research on socially and culturally related training and improved patient outcomes remains scarce.8

Student-driven and Institution-driven SJ Programs
Moving beyond institutionally-driven programs, the student-driven development of SJ programs provide a unique learning opportunity for both instructors and participants. Drawing upon Adult Learning Theory, student-driven programs permit students to identify their own needs, define their education, and determine their respective paths of SJ.9 A good example of student-driven social justice programs in medical education is the Mount Sinai School of Medicine’s Human Rights and Social Justice Scholars Program (HRSJ Scholars Program). In 2011, six Mount Sinai medical students developed the HRSJ program, which pairs students with a faculty mentor and provides the opportunity to create a SJ research project, such as working with a local community group.10 The HRSJ program selects 10 to 12 students per class for a comprehensive curriculum in health equity, human rights, and SJ.

The John A. Burns School of Medicine (JABSOM) program serves as another good example. Inaugurated in 2011, the Student Justice Curriculum Program (SJCP) at JABSOM is an elective spanning all four years of the student’s medical education. Consistent with the Problem-Based Learning (PBL)-focused JABSOM curriculum, the SJCP is based on the principle of self-directed learning. Taking a longitudinal approach, the SJCP, can be conceptualized as consisting of three components: (1) active self-directed learning and didactics; (2) implementation and action; and (3) self-reflection and personal growth.2 Each phase utilizes an integrative approach of lectures, group discussions, and community-based activities to promote cultural humility, social awareness, and leadership skills. The purpose of the program was to implement a student-driven SJ curriculum to expose students to various components of SJ in health and medicine by using their own inputs for content and design. In addition, SJCP may serve as a logistic and research-oriented model to establish a thematic framework for future student-
driven SJ curricula. Participants who complete the curriculum earn the Dean’s Certificate of Distinction in Social Justice upon graduation. The first certificate was awarded in May 2013.

Given the critical lack of comparative efficacy studies, it is especially important that SJ educational programs also be assessed and evaluated with the same rigor and scrutiny in examining the outcomes of their interventions. This article presents notable strengths and challenges of specific pedagogic methods and evaluation processes for a student-driven SJ program.

Methods

Data Source
Self-selected participants, first-and second-year medical students, were given a formal presentation detailing the components of the SJCP and the evaluation process (Table 1). Only students who chose to participate in the SJCP were contacted for evaluation. Informed consent to participate in the evaluation research was obtained from participants. The evaluation process included several components; however, this paper focuses on describing the results obtained from the Entry Evaluation form, which was administered to enrolled students at the beginning of the program. All medical students who agreed to participate in the evaluative process were de-identified and assigned a unique code. Human subject research exemption was obtained from the University of Hawai‘i IRB (#19538).

Components of the Survey
There were twenty questions on the Entry Evaluation form. The Entry Evaluation form assessed participants’ familiarity with and interest in SJ. The data were aggregated and analyzed from the Entry Evaluation online Google Docs survey form of the SJCP to identify the participants’ status and opinions in four main dimensions: (1) foundations in SJ; (2) didactics in SJ; (3) implementation of SJ in health; and (4) expectations of the SJCP. These dimension groupings were created using a focus group of participants in the previous year. The Entry Evaluation survey was used to inform curriculum development for the SJCP; for example, participant responses were used to tailor the didactic and community activities portions of the curriculum to participant interests. Each dimension listed four affirmative statements, such as “I believe SJ is important in health care,” to which participant indicated their level of agreement on a five-point Likert Scale (“1” to “5”). For the SJ foundation and didactics, and implementation of SJ dimensions, a score of “1” represented “Completely Disagree” and a “5” represented “Completely Agree”; for the expectation of the JABSOM SJCP dimension, a “1” represented “Not Very Important to Me,” and a “5” meant “Very Important to Me.” A score of “3” represented “Neither agree nor disagree,” or “neither important nor unimportant,” respectively.

We asked the participants to fill in two free-text questions, one which asked them to list keywords they felt were associated with SJ, and the other asking them to list three individual goals upon completion of the program (ie, their program expectations). Lastly, the participants were asked to select their method(s) of learning including options such as, lectures, group discussion, independent reading, or research projects within the didactics and implementation domains; they were able to select one or multiple learning modalities. Out of forty-two students who initially decided to participate in the SJCP, there were four withdrawals, leading to thirty-eight participants who completed the Entry Evaluation form.

Analysis of the Survey
For all dimensions, each Likert questionnaire item was grouped into “Satisfactory,” and “Needs Improvement.” A score of “3” was considered a neutral response, and anything below a “3” was considered an area needing improvement. The two free-text questions were analyzed and grouped according to common themes and keywords. For example, the free text responses “no more health disparity,” “health equity,” and “equal justice for all people across race” were all grouped in the “Inequity/Equity” association. Program Expectations were similarly grouped by theme. For example, “I want to learn more about

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<th>Objectives</th>
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<td>Didactics</td>
<td>Educate medical students in the components of social determinants of health by providing appropriate resources and structure.</td>
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<td></td>
<td>Develop important professional skills for the establishment of community-based programs and academic endeavors related to promotion of health equity.</td>
</tr>
<tr>
<td>Implementation</td>
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<tr>
<td></td>
<td>Empower medical students to examine the concepts of social medicine to engage in meaningful discourse and collaborative problem solving, and to be able to use this knowledge to implement appropriate improvements in access to, delivery, and quality of health and health care to all members of society</td>
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<td>Evaluation</td>
<td>Demonstrate a commitment to clinical application of SJ concepts</td>
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<tr>
<td></td>
<td>Promote personal growth, self-reflection, and social awareness as a life-long enterprise.</td>
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social justice” was grouped in “Developing SJ Knowledge,” and “I would like to serve my community” was grouped in “Community Service Involvement.” The free text fields were grouped by three separate student raters. The raters were given instructions to use verbatim keywords as themes whenever possible and organize grouping based on the keywords of the free text. The thematic groupings were selected by the consensus of all raters. For the keyword groupings, the inter-rater agreement was considered satisfactory (Cohen’s Kappa Weighted = 0.74, 95% CI = 0.58-0.91%). The findings of the surveys were utilized to tailor the content of curriculum for the participants. For example, if the group significantly favored “Community Service Involvement,” there would be more community service activities planned for the year.

Results
Evaluation in SJ Foundations, Didactics, and Implementation
The participants identified major areas needing improvement” in three dimensions: (1) theoretical foundations in SJ (Didactics); (2) SJ research and presentation (Implementation); and (3) prior SJ experience (Foundations) (Figure 1). Approximately 58% of participants chose a neutral score of “3” for prior SJ experience. Almost 40% of participants selected a “1” in theoretical foundation in SJ, and no one selected a “5.” Similarly, approximately one-third of participants selected a “1” in SJ research and presentation. The highest rated area was in importance of SJ with 84% of participants selecting a “5.”

Thematic Analysis of SJ Keyword Association and Program Expectation
In SJ keyword association, over half of the participants (55%) explicitly mentioned some aspect of ensuring health “equity” or combating health “inequity.” Other SJ associations were improving “healthcare access,” ensuring “human rights,” and serving the “underserved/underrepresented” (Figure 2). In program expectations, the majority of participants’ expectations fell in “developing SJ knowledge,” “community service involvement,” and “integrating SJ in clinical and/or academic medicine.” Approximately one-third of the students hoped to focus on “developing SJ knowledge.”

Figure 1. Evaluation in SJ Foundations, Didactics, and Implementation. Areas of self-identified deficit were in prior SJ experience, SJ research and presentation, and theoretical foundations. A Likert score of “3” was considered a neutral mark, and anything below a “3” was considered a “Need Improvement” area. Error bars = ± 1 Standard Error.
Figure 2. Thematic Groupings of SJ Associations (2A) and Program Expectation (2B). In SJ Keyword Association, over half of the participants (55%) explicitly mentioned some components of ensuring health “Equity” or combating health “Inequity.” In Program Expectations, the majority (33%) of students focused on “Developing SJ Knowledge.”
Preferred Pedagogic Methods of Didactics and Implementation

The majority of the participants preferred to learn via group discussions, independent reading, and lectures. Group discussion was selected by 87% of participants. In the dimension of implementation, community-based service, and clinical experience were the favored learning methods. Almost 95% of the participants preferred “community-based service” to apply their learning.

Discussion

Strengths and Challenges of the SJCP

As a general profile of the participating students, the Entry Evaluation survey provided excellent insight and feedback on how the content and structure of the SJCP curriculum could be improved to focus on student interests, expand their knowledge base, and address their self-identified areas of deficit. As SJCP is student-driven, the content of the curriculum is highly malleable, and can be amended and customized each year based on feedback from the questionnaire. As the SJCP is an elective, the high rating of the “importance of SJ” component may reflect self-selection among SJ-inclined participants. As further evidenced by the SJ association component, the majority of participants reported associating SJ with health equity. Most participants reported having limited prior SJ experience, reflecting the limited antecedent SJ exposure of the participants and potentially suggestive of the paucity of SJ opportunities in the group’s undergraduate and pre-medical education. Appropriately, the group’s program expectations prioritized developing SJ knowledge and becoming involved in community service. The greatest areas of deficit were in the theoretical foundations, and research/presentations related to SJ, emphasizing important rectifiable areas in the Didactics and Implementation dimensions, respectively. Using their preferred methods of learning, the SJCP can address accordingly the SJ knowledge deficit through a PBL-format, including group discussions, lectures, and independent reading. Similarly, the Implementation dimension can be best addressed actively through the clinical and community-based experiences. As a result of using the SJCP Evaluation survey, the curriculum can be tailored specifically to address the group’s self-identified SJ interests in developing theoretical foundations and subsequently integrating its learning with academic and clinical research, and especially, community service projects.

Framework of Student-driven SJ Curriculum (Figure 3)

The main strength of the SJCP centers on the student-driven component. With minor faculty guidance, the SJCP was largely developed by students, evaluated and refined with students, and organized for expressed needs of students. As a result, the content of the SJCP can quickly be adapted and modified to best fit with the interests and needs of the participants. In addition, the operating cost of the curriculum is extremely minimal. Within the student-driven curriculum, the SJ education is centered on the students and their needs. The Commission on the Education of Health Professionals for the 21st Century calls for health professional education that is both patient-centered and population-centered with the culminating goal of universal healthcare access. In addition, one of the educational outcomes called for is transformative learning. Generally, medical educators see their roles as informative and formative: the transmission of knowledge to learners (to inform) and the placement of learners in settings to develop professional attitudes (to form), so that they become clinically and biomedically competent. However, if the next generation is to lead the reform of the health system so that it delivers health for all, then learners must become “agents of change”—that is, they must undertake transformative learning.

With the goal of introducing SJ themes in health, the student-driven curriculum is highly successful in cultivating self- and team-directed learning. The student-driven framework encourages self-assessment that can adjust the SJ curriculum to the students’ educational interests. Imbued in the SJ curriculum is the notion of “co-intentionality,” which originates from Freire’s problem-posting educational theory, establishes a crucial infrastructure for the mutual ownership of learning between the students and the instructors, who are often more advanced learners in this student-driven curriculum. In this framework, the knowledge development culminates as a collaborative partnership, absent the power differential that is more typical of instructor-learner dynamics. The self-directed component, which remains an important aspect of adult learning theory, assists the students to become experiential and critical learners. Being able to develop and modify the curriculum, in itself, serves as another learning opportunity, a bridge between passive and active learning—for the students. Another key component of the student-driven curriculum lies in the rooted impetus of the SJ education: the students initiate and instill their own concept of change. The student-driven component promotes learning both new sociopolitical and humanistic ideals. Although the duration of the program may be modified, its longitudinal inclusion throughout the entire medical education ensures enough time for students to build their knowledge, carry out germane projects of interests, and reflect critically.

Recommendations and Challenges

The composition and quality of the student-driven SJ curriculum is dependent on the collective profile of its participants. In this regard, the elective aspect of the SJCP relies substantially on the inherent SJ interests and initiatives of its participants, and may therefore be difficult to translate into a general program for the entire medical student body.

Faculty collaboration and robust institutional support are necessary for the development of the curriculum, which may favor smaller medical schools and those with sufficient academic resources. Given the transiency of medical students, the development of student leadership and peer-mentoring is also imperative in the continuation of the program. In the early curriculum development, regular communications and logistic planning between the students and the institution is warranted.
Figure 3. Framework of the Student-Driven Social Justice Curriculum. The curriculum structure revolves around the curricular triad of Education-Implementation-Evaluation, which encourages the students to take the initiative to define, execute, and refine their academic and social justice interests.

to ensure the sustainability of the program. At the extremes, student-driven development may detract inappropriately from the core medical education objectives; conversely, institution-driven development may eliminate the innovation and transformative benefits of student-driven curriculum. Moreover, community partners must be involved in the conceptualization of the active learning components; this element of community collaboration allows for mutual accountability of services and knowledge between the students and the community.

Further studies are warranted in evaluating the impact of this educational intervention on the participants’ knowledge, skills, and attitudes. In addition, future studies need to correlate the student-driven SJ curriculum with student preparedness during clinical years and primary care residency selections - and, ultimately, with patient outcomes and elimination of health inequalities.

**Conclusion**
The task of creating and integrating a SJ program in medical education is challenging. In the current rapidly evolving healthcare environment, which requires a global and interdisciplinary awareness, SJ programs in pre-medical and medical education are needed to cultivate socially conscious and collaboration-inclined health professionals. As a novel potential educational strategy, student-driven SJ curricula instill a personal sense of responsibility and ownership in the students’ critical and transformative learning. The framework of a student-driven SJ curriculum requires collaborative student initiatives with institutional sustainability to cultivate the appropriate self-directed experiential learning. This study describes a survey-based strategy for soliciting information from participants in developing student-driven SJ curricula tailored to student interests. In addition to generating useful feedback for the program, the survey provides an opportunity for students to begin examining their own individual educational needs in SJ and interest in participating in a student-driven educational opportunity.

**Conflict of Interest**
None of the authors identify a conflict of interest.

**Acknowledgement**
The authors would like to thank the Partnership for Social Justice, without whose support and participation, this study would not have been possible.

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References

Optic Nerve Sheath Diameter Measurements by CT Scan in Ventriculoperitoneal Shunt Obstruction

Syed Javed H. Zaidi MD and Loren G. Yamamoto MD, MPH, MBA

Abstract
The objective of the study was to determine differences in optic nerve sheath diameter (ONSD) measurements taken from computed tomography (CT) scans of patients with ventriculoperitoneal shunt (VPS) obstruction versus controls. Inpatients 0-15 years with confirmed VPS obstruction requiring neurosurgical intervention were identified using ICD9 codes. ONSDs, orbit, cranium, and foramen magnum sizes were measured on their pre-surgical CT. Controls included cases at times when their VPS was not obstructed and age and gender matched patients with a CT scan done in the emergency room for head trauma (normal CT findings). Paired T-tests were used for both case-control comparisons. In order to compare the optic nerve sheath size more accurately, the ONSD width was divided by the width of the orbit and by the foramen magnum (antero-posterior) length. Twenty patients were identified with 25 events of VPS obstruction. The right ONSD (RON) was chosen to study. RON/orbit width and RON/foramen magnum diameter for the VPS obstruction versus self-controls, were 0.22 and 0.22, compared to 0.19 and 0.18, respectively, for the non-obstructed self-controls (P = .044 and P = .008, respectively). The same measurements for the VPS obstruction versus age and gender matched controls were 0.22 and 0.21 for the VPS obstruction cases, respectively, compared to 0.17 and 0.16, respectively for the age and gender matched controls (P < .001 and P < .001, respectively). This data confirms that the optic nerve diameter increases during a VPS obstruction. ONSD measurements by ultrasound could add to the evaluation for VPS obstruction.

Keywords
optic nerve sheath diameter, ventriculoperitoneal shunt obstruction, increased intracranial pressure

Introduction
Cranial computed tomography (CT) is currently the most common method used to assess ventriculoperitoneal shunt (VPS) function in children. Cranial radiation in the range that is sustained during a CT scan has been found to cause cognitive harm during infancy resulting in lower cognitive testing performance in adulthood.1 Since cellular brain development is still active in children even after infancy, it should be assumed that high cranial radiation exposure poses cognitive harm to children as well. Most patients with VP shunts receive multiple cranial CT scans since the symptoms suggestive of VP shunt malfunction are very non-specific (sleepiness, fussiness, vomiting, and headache). Funduscopic evaluations are of limited utility in the emergency department (ED) setting since papilledema is a late sign of increased intracranial pressure (ICP). It would be desirable to find a screening method for determining VPS malfunction that does not require cranial radiation exposure. Ophthalmic ultrasonography performed through the closed upper eyelid to measure the optic nerve size (ONS) is easily available, portable, non-invasive, and comfortable enough that it usually does not require sedation, even for young children. An increase in ICP directs cerebrospinal fluid into the space between the dura and optic nerve called the optic nerve sheath. This is visible on imaging as an increase in size of the nerve (including the nerve sheath). Previous studies have demonstrated a correlation between the ONS and intracranial pressure in adults.2,6 There have been a few studies in children.7,11 However, these studies were limited to small groups of children, often in controlled environments with no comparison data and a lack of patient size correction for ONS diameters.

Since cranial CT scans also contain optic nerve size data, the purpose of this study was to utilize existing retrospective CT scan data to further validate the relationship between ONS and VPS malfunction causing raised ICP, to determine if ultrasound assessment of ONS can be used as a screening measure for VPS malfunction.

Materials and Methods
This was a retrospective review of CT scans of patients with known VPS malfunction compared to CT scans of controls seen at Kapi‘olani Medical Center for Women and Children in Honolulu, Hawai‘i. VPS malfunction cases were identified among inpatients age 0 to 15 years by medical records using ICD9 codes (996.2, 348.1, 799.82) for the period November 2008 to June 2012. Western IRB approval was obtained prior to our review of patient data (WIRB PRO NUM: 20112196). The electronic medical records for these patients were reviewed to verify the presence of VPS malfunction by confirming that an invasive measure to relieve obstruction was performed within 48 hours of the CT scan that included VP shunt surgical revision/replacement, serial lumbar punctures (LP) (at least 3), or serial VPS taps (at least 3). This defined the VPS malfunction CT group.

Two different CT scan control groups were identified; gender and age matched controls and VPS self-controls. Age and gender matched control CT scans were obtained by reviewing CT scan log books. The log book was reviewed to find an age and gender matched patient who received an ED CT scan for head trauma. Age matching was done by matching patients with controls who had a date of birth within six months of each other. Then, the electronic medical records were reviewed to determine that the CT scan was normal and the patient was discharged home from the ED without intervention.

VPS self-controls were CT scans from patients in the VPS malfunction group, during periods when their CT scans did not show any evidence of obstruction or elevated ICP and they needed no intervention to decrease ICP (including shunt taps or VPS revisions).

The CT scan images identified in the three groups were re-
viewed by a single study investigator (SJZ) who was assisted by a CT technician. The following measurements were recorded: right/left horizontal optic nerve sheath diameter (ONSD), right/left vertical ONSD, right/left horizontal/vertical ONSD in the retrobulbar area, right/left vertical orbit diameter, anterior-posterior (AP) length of the foramen magnum, AP length of skull (mid forehead to occiput), and skull circumference. General demographic information for all patients was also collected.

VPS malfunction and VPS self-control CT measurements were compared using a paired T-test. VPS malfunction and age and gender matched control CT measurements were also compared using a paired T-test. To create a more universal comparison method that was not patient size/age dependent, the VPS malfunction group and age and gender matched control group were additionally compared by correcting the optic nerve size measurements. After comparing image quality and slice thickness on available CT scans, the right optic nerve’s horizontal width (RON) was chosen for this study, because it was measured more accurately. Twenty patients with 25 confirmed episodes of VPS malfunction were initially identified. All data points could not be measured on some cases, leaving us with 19 episodes of VPS malfunction amongst 14 patients. One patient had three episodes and three patients had two episodes. The remaining patients had a single episode.

It has been found that the orbital width increases with age. It is therefore prudent to use a correction factor for age and size that most closely correlates with changes in skull size rather than the absolute measurements of ONSD, which is more likely to be highly variable amongst our wide age range of subjects. To date, a widely accepted, empirically-validated methodology for adjusting ONSD measurements has not been established. Hence, two measures, right horizontal orbital width (ROW) and foramen magnum sizes, were used as correction factors for patients’ size resulting in the values RON1 (RON divided by the ROW) and RON2 (RON divided by the AP length of the foramen magnum) respectively for cases, and CRON1 and CRON2 for controls. These were chosen since it is known that the skull dimensions grow with the child, potentially yielding a useful correction factor. The foramen magnum size is obtainable on CT, but not on ultrasound. The orbit width is obtainable on both.

**Results**

Table 1 summarizes the VPS malfunction cases compared to self-controls. A self-control could not be found for 6 episodes, because a CT scan was not performed during a period when the patient’s VPS was working, with no evidence of raised ICP, or the patient was hospitalized (for intercurrent illness with no signs of raised ICP) but no CT scan was obtained. Therefore, 13 paired comparisons amongst 9 patients remained. Table 2 summarizes the VPS malfunction cases compared to age matched general controls. In both tables 1 and 2, bold italic numbers identified cases in which the control value (no VPS malfunction) was the same or larger than the VPS malfunction value. In these cases, if such a control was employed, it would result in incorrectly concluding that the VPS was working (an error). These cases were included in the analysis so as not to introduce a selection bias based in the results.

Table 1 shows an error rate for RON of 2/13 (15%), for RON1 of 3/13 (23%), and for RON2 1/13 (8%). Table 2 shows an error rate for RON of 6/19 (32%), RON1 5/19 (25%), and RON2 0/19 (0%). Table 3 summarizes the statistical comparison between the ONS of the VPS malfunction patients compared to the two different control groups. These demonstrate that, overall, the ONS measurements of the VPS malfunction patients are larger than that of the controls.

<table>
<thead>
<tr>
<th>Case</th>
<th>Age(ys)</th>
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<th>RON1</th>
<th>RON2</th>
<th>CRON</th>
<th>CRON1</th>
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<td>4.33</td>
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Table 2. Optic nerve sizes (mm) in VS malfunction patients compared to general controls. Italic bold font numbers indicate control values that are the same or larger than VPS malfunction values.

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<th>RON2</th>
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Table 3. Statistical comparisons (paired T-tests). P-values are singled-sided probabilities.

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<td>Mean difference</td>
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<tr>
<td></td>
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<td>.004</td>
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<td>VSP malfunction versus general controls</td>
<td>Mean</td>
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<td>Standard deviation</td>
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<tr>
<td></td>
<td>P-value</td>
<td>.002</td>
<td>&lt;.001</td>
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**Discussion**

Age and gender matched controls are not necessarily a reliable comparison to a VPS patient because they might not be the same size as the patient. Also, it is possible that the patient’s previous history of hydrocephalus could have affected their orbit size measurements. Therefore, it may be useful to consider other strategies for adjusting measurements for underlying differences in patient size and history. To date, a widely accepted, empirically-validated methodology for adjusting ONSD measurements has not been established.

Both Tables 1 and 2 demonstrate that the lowest error rates occur when using the foramen magnum as a correction factor. Using the foramen magnum correction might result in a more accurate estimation of true positivity or provide for a stronger positive predictive value. However, in attempting to apply this method to ultrasonography, the foramen magnum size cannot be measured using ophthalmic ultrasound. Orbital width, though not providing as accurate a conclusion as the foramen magnum as a correction factor, can still be measured by ophthalmic ultrasound, and would potentially be the best correction factor in this regard. If the optic nerve disc or sheath diameter is to be used as a useful screening measure, a normal range that is not age or size dependent must be established. Alternatively, a table of normal values based on age or size must be established.

Methods to measure optic nerve sheaths without X-ray include ultrasound and MRI scanning. While MRI could simply visualize the brain, MRI availability is more limited, and the entire MRI scan is slow, requiring sedation. A more limited MRI scan that views the optic nerve sheath size and a single cut through the lateral ventricles could be done much faster and would likely not require sedation. Such brief/limited MRIs are currently being done at some centers to assess patients for VP shunt malfunction.

Since ophthalmic ultrasound is capable of measuring the ONS and orbital width, the results of our study support the use of ultrasonography as a potential screening tool to detect acute increases in ICP from VPS malfunction. Other studies have shown a positive correlation of the measurement of optic nerve sheath diameters by ultrasonography with increased ICP in adults, but there are only a few studies performed in children.

Some studies have measured the ONS by MRI and found a positive correlation with increased ICP. One study suggested that the upper limit of normal for optic nerve sheath diameter is 4.5 mm (measured 3 mm behind the globe) in patients over 1 year of age, and 4.0 mm in children less than 1 year of age and that ONSDs in excess of these values are strongly suggestive of raised intracranial pressure. Another study suggested the ONS is regarded as definitely enlarged when exceeding 5 mm in children above age 4 and concluded that ultrasound studies of the optic nerve may contribute information about the acutely increased ICP in critically ill patients.

Measurements of the subarachnoid pressure of the optic nerve showed inter-individual variation and a linear relationship with ICP during cadaver testing. Hansen et al. concluded that the human ONS has sufficient elasticity to allow a detectable dilation in response to intracranial hypertension. They, however, recommended serial ultrasonography studies to demonstrate pathologically enlarged sheaths or ongoing enlargement. A more recent study in 2008 directly correlated ventriculostomy measurements of ICP with ultrasonographic ONS measurements and provides further support for the use of ONS measurements as a noninvasive test for elevated ICP. Others support transorbital ultrasonography and measurement of ONS as a reliable means to identify pediatric patients with raised ICP.

This was, however, not supported in a prospective study involving measurements done by emergency physicians. The level of operator experience is a possible confounder in assessing the intrinsic value of using ultrasound as a means to measure ONSD. The small dimensions to be measured and the frequent occurrence of artifact in the sonographic area of interest may yield inconsistent results when performed by inexperienced operators. This limitation may be minimized if inexperienced providers are required to perform a minimum number of supervised measurements of both distended and nondistended optic nerve diameters prior to independently performing ONSD measurements that would affect management. Small differences in measurement of the ONSD related to the experience level of the operator could also be due to the model of the ultrasound device used or the position of the probe. As the optic nerve courses through the orbit, it can be visualized from a variety of angles in relation to the globe. Different ONSD measurements can result from differences in probe position. More studies and a larger population size may be necessary to establish ER physician proficiency in measuring ONSD after an adequate amount of training.

All ONS measurement methods are likely not identical. Measuring the ONS 3 mm behind the globe by MRI is likely different than measuring the ONS by ophthalmic ultrasound. The obtained values of ONS in Tables 1 and 2 are larger than those in the ultrasound studies, even for our controls. Thus, while the relationship between larger ONS and VPS malfunction is confirmed, the method of measurement appears to affect the critical values; thus a table of normal values would need to take this into account and further define the exact means of acquiring the measurement.

Since ultrasound is non-invasive and relatively easy to perform (Figure 1), a potentially effective strategy could be to perform ONS measurements on VPS patients at regular visits (for example at some immunization and annual physicals), while their VPS is working. If the patient presents subsequently with symptoms and signs of VPS malfunction, a clinician could utilize these baseline measurements to determine if the patient’s current ONS measurements are enlarged. Standardization of how these measurements are obtained is crucial to minimize inter-observer variation. Storage of the baseline ultrasound images and measurement values in the electronic medical record would contribute to the consistency of the measurement.

The obtained CT results and their significance can be extrapolated to the use of transorbital ultrasonography to obtain
the same measurements as determinants of raised ICP. It does have to be taken into account that CT measurements of the optic nerve sheath may differ from ultrasonographic measurements of the same. Also, absolute ONSD measurements are age/size dependent requiring a correction factor such as the orbit width, which can be measured on ultrasound as well.

**Conclusion**

Ventriculoperitoneal shunt malfunction results in an increase in the size of the optic nerve. This is consistent with other studies. Since these measurements can be obtained non-invasively without radiation via ultrasound, this could be a useful screening test if measurement standards and normal value data (or baseline pre-VPS malfunction measurements) are available.

**Conflict of Interest**

None of the authors identify a conflict of interest.

**References**

External Foam Layers to Football Helmets Reduce Head Impact Severity

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Abstract
Current American football helmet design has a rigid exterior with a padded interior. Softening the hard external layer of the helmet may reduce the impact potential of the helmet, providing extra head protection and reducing its use as an offensive device. The objective of this study is to measure the impact reduction potential provided by external foam. We obtained a football helmet with built-in accelerometer-based sensors, placed it on a boxing mannequin and struck it with a weighted swinging pendulum helmet to mimic the forces sustained during a helmet-to-helmet strike. We then applied layers of 1.3 cm thick polyolefin foam to the exterior surface of the helmets and repeated the process. All impact severity measures were significantly reduced with the application of the external foam. These results support the hypothesis that adding a soft exterior layer reduces the force of impact which may be applicable to the football field. Redesigning football helmets could reduce the injury potential of the sport.

Keywords
Injury prevention, concussion, football helmet, sports injuries, head trauma

Introduction
In American football, players at all levels of competition have sustained significant head injuries.1,4 While professional and collegiate football are the most visible aspects of this sport, children and adolescents in youth and high school leagues vastly outnumber the professional and collegiate athletes.1,4 Football helmets are designed to protect the head. The current design has a rigid exterior with a padded interior. Substantial impact occurs through helmet-to-helmet, helmet-to-field, and even helmet-to-body contact.1,3 Of particular concern is when players “lead” with their helmets, using them for offensive purposes.5,7 This can cause injury to both players involved in the impact. Since players perceive that the helmet protects them, this could potentially encourage them to use the helmet as a striking force since it hurts the other player but does not hurt the originating player resulting in a harder hit. This factor has led to specific penalties against this practice. This penalty is part of modern football. In the days of leather helmets, such a penalty was not applicable to the football field. Redesigning football helmets could reduce the injury potential of the sport. Softening the contact reduces the incentive to use the helmet as a striking force. Our hypothesis is that adding a soft cushion layer to the exterior of the helmet will reduce the impact potential of the helmet. This would have two benefits: (1) Additional head protection, (2) Eliminating the external hardness of the helmet removing the incentive to use the helmet to inflict a hard hit on opposing players. The purpose of this study is to investigate the effect of exterior protective material on the magnitude of the helmet impact force.

Methods
This helmet study was an experimental design involving no human subjects. A commercial product made by football helmet manufacturer Riddell (Elyria, OH) measures complex impact characteristics via accelerometer-based sensors built into the helmet coupled with its patented Head Impact Telemetry System (HITS) technology (developed by Simbex, Lebanon, NH, and commercially marketed by Riddell). It records the location, magnitude, duration, and direction of up to 250 impacts per session.10,11 Impact data downloads wirelessly to a desktop or laptop computer. One of these helmets was purchased with the computer interface at retail price ($1381) through the local Riddell product representative. This helmet is available commercially and several football programs are known to use these helmets to monitor the head injury potential of their players. Notably, Virginia Polytechnic Institute and State University’s football team uses these helmets.12

The HITS helmet (size X-large) was placed upon a heavy duty head and torso mannequin used for boxing practice (Century BOB, Century MMA, Oklahoma City, OK) to mimic the degree of neck movement that would normally occur with a helmet strike. The helmet was struck with a reproducible force by swinging a standard helmet (size medium, Riddell) with internal weights from a nylon rope attached to a fixed height. This “pendulum” model simulates a standard impact from the helmeted head of an opposing player to the HITS helmet. The total pendulum swing weight was 4.0 kg. The pendulum helmet was released from a distance of 125 cm horizontally and 160 cm vertically from the HITS helmet-mannequin (Figure 1). The Riddell HITS software recorded the resulting peak linear acceleration (in g units, 1g = 9.8 meters per second squared) and peak rotational acceleration (radians per second squared) of the center of gravity (CG) of the mannequin head.13 Three other calculated head injury measures; Gadd Severity Index (GSI), HIC (head injury criteria), and HITsp (high impact telemetry suspect profile) were also measured. All data was recorded by the HITS software and uploaded to an online database.

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To modify the exterior surface of the helmets, we applied pieces of 1.3 cm thick polyolefin foam using fixed amounts of duct tape (Figure 2). We used a 21 by 20 cm piece for the HITS helmet. This was fixed to the helmet surface with four pieces of duct tape covering all four edges of the foam. We used a 15 cm diameter circular piece for the pendulum helmet. Six pieces of duct tape were used to fix all edges of the foam to the helmet. Additional layers were fitted with the same materials in the same arrangements for the respective helmets.

The HITS helmet-mannequin was struck on the left parietal region under nine conditions involving different foam layering “conditions” of the HITS helmet and pendulum helmet. Conditions 1 through 9 were defined by varying the number of layers of external foam placed on the HITS helmet and the pendulum helmet (i.e. condition 1 had zero layers of foam on the HITS helmet and zero layers of foam on the pendulum helmet; condition 2 had zero layers of foam on the HITS helmet and one layer of foam on the pendulum helmet, etc.; Table 1). Up to two layers of external foam were placed on either helmet. The foam layer conditions, described in the first column of Table 1, were placed in ranked order based on expected results (we expected more layers of external foam to produce lower impact severity measures but were unclear as to whether more layers on the HITS helmet versus the pendulum helmet would produce better results). Impacts for each condition were repeated 10 times (9 conditions, 90 total impacts).

The HITS software calculated multiple measures used to assess impact. Impact magnitude was quantified by peak linear and rotational acceleration. Gadd Severity Index (GSI), a head impact severity metric that relates injury to head acceleration over time, is unit-less. Head Injury Criteria (HIC), a head impact severity metric that relates injury to head acceleration over time...
for a discrete time frame (15ms), is unit-less. HIT Suspect Profile (HITsp) is a non-dimensional head impact severity measure (unit-less) that combines peak linear and angular acceleration with impact location to produce a single impact metric to predict concussion. GSI and HIC are non-dimensional head impact severity measures that were based on cadaveric studies of skull fractures but are less reliable in determining impact-induced brain deformity. Results were expressed in mean values with standard deviations and 95% confidence intervals of the mean (95% CI), calculated using Microsoft Excel (Microsoft, Redmond, WA).

## Results

Mean values of 90 total impacts were obtained in this study. The application of external foam to either helmet significantly reduced the impact severity measures. The results are displayed graphically in Figures 3 to 7.

Peak linear acceleration experienced by the mannequin head was measured in gravitational G units (9.8 m/sec²). Peak rotational acceleration experienced by the mannequin head was measured in radian/sec².

Figures 3 and 4 (linear and rotational acceleration, respectively) suggest that a single layer of foam in this model (conditions 2 and 3) are no different than no foam at all (condition 1). However, once more layers of foam are added to either helmet, the 95% confidence intervals show significantly lower linear and rotational forces sustained.

Head impact severity measures (GSI, HIC, HITsp) (Figures 5, 6, 7, respectively) were significantly reduced by the addition of foam layers but the declining relationship was not as proportional as that seen with linear and rotational acceleration (Figures 3 and 4, respectively).

## Discussion

This preliminary experiment studied a single striking velocity using the model described which achieved linear acceleration in the range of 30 G’s; however, it is known that impacts causing peak linear acceleration exceeding 98 G’s are more typical of mild traumatic brain injury (mTBI). The purpose of this study was to assess reduction potential for impact and head injury risk due to helmet design modification. Current hard shell coverings on football helmets may reduce the incidence of skull fracture, but their implications in concussion reduction are limited. One study on impact testing indicated that the head injury risks while wearing vintage leather football helmets were comparable to those of several modern football helmets. Additionally, hard shell coverings may provide incentive for players to use their helmets as offensive devices to hurt other players, possibly hurting themselves in the process. Softening the outer shell may reduce the impact potential and remove the impetus to use football helmets as offensive devices. Our data confirm that adding two or more foam layers between the two helmets (one layer on each helmet or two layers on one of the helmets) reduces the impact potential, providing additional head protection. This theoretically reduces the incentive to use the helmet to inflict a hard hit on other players, but would need to be proven in actual use.

There may be a point of decreasing returns, where increasing the foam layer has less effect on impact reduction. The point of diminishing returns likely varies with the striking force severity, since very soft hits likely require very little foam padding, while very hard hits, would benefit from greater padding.

With the exception of condition 7 (1 layer HITS, 2 layer pendulum) and 8 (2 layer HITS, 1 layer pendulum), the addition of foam to the struck helmet (HITS on mannequin) seemed to
reduce impact potential more than addition
of foam to the striking helmet (pendulum
helmet). Addition of a foam layer may have
a greater protective effect when placed on
the struck helmet than on the striking helmet,
but this might be moot since the presumption
would be that offensive and defensive players
would have to utilize the same type of helmet.
However, since the faceguard is different for
the different player positions, the possibility
of having position-specific helmet types still
exists.

Although GSI and HIC showed an overall
reduction when external foam was added to
the helmets, the results did not correlate with
linear and rotational acceleration data of the
same conditions. Perhaps the best explanation
for this phenomenon is that, as stated earlier,
GSI and HIC are composite measures and were
developed based on cadaveric studies of skull
fractures and thus may have limited reliability
in this study.

While this study demonstrates that adding
foam to the external surface of the helmet
will reduce impact severity, it has other con-
sequences that must be considered. The hard
helmet exterior is smooth so that when a player
hits the turf, his head will slide, reducing the
risk of a sudden deceleration that could place
the player at risk of concussion or cervical
spine injury.18 This smooth helmet exterior trait
should be preserved by covering the exterior
foam with vinyl or polished leather (the old
leatherhead helmet may still return).

Future studies should include a greater va-
riety of striking velocities to achieve different
striking forces. Adding weight to the pendulum
helmet and increasing height of release may
bring the experiment closer to threshold levels
associated with TBI-producing impacts.

A limitation of the study was that data was
taken solely from strikes to the left side of the
HITS helmet in the parietal region. Strikes to
the sides, top, back, and front of the helmet
can occur for all players, although studies
have demonstrated that player position largely
determines impact location.19 Future studies
will position the helmet-mannequin to receive
impact at more locations.

A product called “Guardian Cap” is a foam
exterior helmet on the market.7 This article
claims that independent research shows impact
reduction; however no published research on
this product could be found via PubMed or
Google Scholar.
Although the mannequin was representative of a human subject in size and form, the material composition did not match that of a human body. The mannequin neck is more rigid and inflexible compared to a human neck, possibly limiting recorded impact magnitude. The NOCSAE headform (Southern Impact Research Center, LLC) and Hybrid III neckform (Humanetics Innovative Solutions) are better representations of human subjects. Regardless of the human model chosen, it is nearly impossible for any still model to accurately mimic the mechanics of an injury impact in motion since the human player will react by avoiding, tensing, rotating, or by other means, altering the kinetic factors of the actual impact.

**Conclusion**

Adding a foam layer to the exterior surface of a football helmet reduces the impact severity and injury potential for concussion. More data is currently needed to determine what type of material and what thickness is needed to achieve the optimal dampening effect. More research is needed to assess the overall safety and risk potential of football helmet modification before a definitive recommendation can be made.

**Conflict of Interest**

None of the authors identify a conflict of interest.

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Figure 7. Head Impact Telemetry Suspect Profile (HiTsp)

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References
**Background**

Medical ethics is an important topic for all healthcare professionals. It is a difficult subject to teach students in healthcare. Incorporating ethical issues to guide decision making poses a challenge when there are conflicts between ethical principles.

The authors present an overview of the fundamentals of healthcare ethics, review how ethics is taught traditionally, and how experiential learning using simulation based education techniques might be applied to teaching medical ethics.

There are four traditional basic principles of biomedical ethics\(^1\) which serve to guide ethical decision making:

- **Autonomy**
  Physicians' respect for patients prerogative to refuse or choose a treatment. People have the right to control what happens to their bodies. This principle means that an informed, competent adult patient can refuse or accept treatments, drugs, and surgeries according to their wishes. People have the right to control what happens to their bodies as free and rational beings. These decisions must be respected by everyone, even if the decisions are not in the best interest of the patient.\(^2\)

- **Beneficence**
  Physicians act in the best interest of the patient. All healthcare providers must strive to improve their patient's health, to be of most benefit for the patient in every situation. But what benefits one patient may not be the same for another. Each situation should be considered individually. Values that might conflict with beneficence may need to be considered.\(^2\)

- **Non-maleficence**
  Physicians “do no harm” to patients or society. “First, do no harm” is the bedrock of medical ethics. In every situation, healthcare providers should avoid causing harm to their patients. They should be aware of the doctrine of double effect, where a treatment intended for good unintentionally causes harm. This doctrine helps to make difficult decisions about whether actions with double effects can be undertaken.\(^2\)

- **Justice**
  Physicians provide care with fairness and equality when offering treatments to patients and allocating scarce medical resources. Actions must be justified in every situation. The burdens and benefits of treatments must be distributed equally among all groups in society.\(^2\)

These four classic principles of biomedical ethics anchor and guide decision making and focus for integrating ethical principles in the delivery of healthcare.

The American Medical Association and other professional organizations publish ethical principles which are considered “standards of conduct,” that seek to guide ethical practices in various healthcare domains such as diverse areas as genetic testing, advanced care planning, transplantation, disaster preparedness, and physician participation in interrogation.

In general, doctors treat patients and make clinical decisions based on all four principles. Major challenges arise when there are conflicts between principles or between individuals involved in decision making that require doctors to make difficult decisions. Examples of these situations include end-of-life care controversies balancing beneficence and autonomy; decisions regarding withholding CPR; conflicting opinions or wishes between relatives; “grey-zone” medical treatments; and, complex decisions with medico-legal implications (eg, an illegal immigrant in need of medical care may bring conflict between beneficence and justice.)

**Teaching Medical Ethics**

Teaching of medical ethics at JABSOM is integrated into the case-based problem-based learning (PBL) curriculum, rather than as discrete “Ethics Curriculum” elements such as a lecture series, workshops, or other learning activities. JABSOM believes that teaching of basic ethical principles can be accomplished with a combination of didactic and experiential learning, including small group discussions, lecture, and case-based problem-based learning. Subsequently, teaching about application of ethical principles in the conflicted issues using a real or simulated situation offer an opportunity for learning.

Unlike clinical practice, the goals of integrating medical ethics into the medical student curriculum are to provide a useful framework for understanding and analyzing ethical conflicts, which will inspire students to make thoughtful ethical clinical
decisions, rather than providing precise strategies and exact answers for management of specific situations. Educators may struggle to design effective and meaningful educational experiences that can not only develop an understanding of ethical principles, but also demonstrate application of these principles. These goals may not be achieved adequately by lectures or small group discussion. It is within this context that simulation-based experiential learning may augment the undergraduate medical education curriculum for medical ethics.

**What is Simulation?**
The Society of Simulation in Healthcare defines simulation as “the imitation or representation of one act or system by another.” Healthcare simulations can be said to have four main purposes; (1) education, (2) assessment, (3) research, and (4) health system integration.

Typically, a teacher designs a simulation based clinical scenario using various teaching tools such as manikins, task trainers, standardized patients (SPs), or role-play by staff or students. Students then participate with facilitator guidance by demonstrating the key integrated skills, tasks, and decision making according to pre-determined objectives. Following the simulation experience a structured faculty facilitated debriefing and discussion are conducted to allow maximal long-lasting learning through reflection. Debriefing is conducted for the purpose of reinforcing predetermined educational principles and objectives, and to identify gaps in learner knowledge or skill.

**Why Simulation? Why is Simulation Good for Teaching?**
Simulation is a powerful teaching tool, leveraging and incorporating many key principles of adult learning theory and evidence. Simulation allows both training and evaluation which can be standardized and poses none of the patient risk associated with experiential learning conducted in the actual clinical setting. Simulation based training provides a bridge between didactic and observational learning to clinical practice by allowing repetitive practice, and mastery based learning prior to or in parallel with traditional bedside training.

Based on the classic Bloom’s taxonomy of learning objectives, simulation based inductive learning promotes learning at the highest levels of all three objectives including cognitive (analyze + synthesis + evaluation), affective (organizing + characterizing) and psychomotor (adaptation + origination). Based on the revised Bloom’s taxonomy, simulation can be applied to reach teaching objectives up to and including the level of meta-cognitive knowledge, and advanced learner cognitive processes including application, analysis and creation. Using Merrill’s level of instructional strategy, we categorize simulation as a level 3 instruction strategy; “task-centered with demonstration and applications.”

Significant barriers and limitations are identified regarding proliferation of simulation based training methods. Simulation is costly, time-consuming. Educators must develop interactive facilitation skill which requires practice to achieve competence, especially when the learning objective is as complex as medical ethics.

**Current Status: Simulation in Teaching Biomedical Ethics and Conflict**
All medical schools in the United States have incorporated simulation as a teaching technique. The Liaison Committee on Medical Education (LCME) requires instructional methods that are appropriate for the achievement of course objectives. However, a comprehensive literature review in 2004 reported by Eckles, et al. revealed significant gaps regarding the teaching of medical ethics.

Lehman’s 2004 survey also indicates that 50% of US medical schools offer a mandatory introductory Ethics course. Some medical schools, including JABSOM, provide lectures about ethics and professionalism to medical students. A large number (40%) of surveyed US medical schools utilize informal opportunities such as bedside teaching, group and case-based discussions about various topics in ethics. Only one-third reported using simulation to evaluate students’ interactive skills, communication and professionalism, including topics such as breaking bad news, managing angry patients, and other topics with ethical content.

In 2006 Mattick reported on a United Kingdom medical school survey results revealing that the bulk of the formal ethics teaching is from a lecture/seminar based forum, although horizontal curriculum integration was identified as a desired direction for improvement. Students noted that integrating ethics theory into clinical scenarios was a more popular approach. New opportunities for teaching in ethics include e-learning and information technology (IT) integration; staff development; links with postgraduate education; and simulation.

Simulation is used to teach professional ethics, communication skills, and law mostly with standardized patient (SPs) techniques. There are no published reports of the use of simulation to specifically teach conflicted ethical issues to medical students. Simulation has rarely been used to teach medical students about ethical conflicts and or to assess their understanding of ethical principles applied to difficult clinical decision making.

The use of simulation to teach medical ethical conflicts in schools of nursing are reported. The following examples illustrate the use of simulation methods for teaching of complex conflicted ethics in healthcare.

Katharine, et al. created a scenario representing conflict between close relatives regarding a terminal cancer patient experiencing cardiac arrest. Nursing students were randomly assigned to one of three teaching methods, each using the same scenario; a hybrid simulation using a high-fidelity manikin plus role-play; an online case study discussion; and an in-person PBL case study with discussion. Student and faculty perceptions when compared, revealed that the hybrid simulation was superior for providing a learning experience regarding legal and ethical content. Katharine, et al. also reported a continuous...
quality improvement (CQI) process to implement this method over several years which helped ensure the quality of student learning experiences.

Boss, et al., created a standardized patient scenario requiring neonatologists to counsel a simulated pregnant young woman with premature labor and her spouse, in a clinically grey area regarding fetal outcomes. It created a difficult conflict between beneficence, non-maleficence and autonomy regarding decision making for management of the premature baby; focusing on the expectant care versus full supportive premature infant care.

Discussion
Convincing data supports simulation as powerful teaching tool in healthcare education. Challenging healthcare topics, such as interpersonal communication or interprofessional team training have been introduced into healthcare curriculum using simulation. (eg, TeamSTEPPS developed by AHRQ).

Application of simulation for medical ethics training in an undergraduate medical school curriculum has the potential of improving current practices. Surveys of educators suggest that improvements in this domain are required to fill gaps in the medical school curriculum. Teaching ethics and using simulation share a common obstacle which is lack of faculty resources. The major difference between teaching clinical content and medical ethics is that the latter is not primarily based on medical science, rather on a combination of social science, medical science, religion, law, economy, culture, language, and more. This renders facilitation of simulation scenarios designed to teach medical ethics more complicated and difficult than topics with a limited focus.

For example, a teacher might choose to create a simulated scenario of a patient suffering from a severe medical emergency in an emergency room. Based on specific medical–scientific objectives, the students’ treatment can be judged to be correct or incorrect for that particular emergency. Facilitation can also be guided by adherence to the clearly delineated established medical treatment objectives. In contrast, assume that the scenario is about an end-stage cancer patient who once said that he declined resuscitation, who is brought by his sister into the emergency room and is diagnosed with a treatable emergency condition. To add to the complexity, his sister asks the ER doctors played by students to support the patient. Regardless of the student choice of action, the facilitator has no well-defined scientific set of facts on which to base the facilitation of the definitively “correct” action. The reasons behind student decisions are more important than the decisions. The objectives of this scenario are wider, less specific and based more on integration and balancing of principles, than on application of specific knowledge or skills. As a result, this simulation requires experienced teachers, assistants, and likely more time to produce successful teaching and learning. This is not an easy task.

Additional evidence is needed to compare conventional methods with the simulation-based methods in teaching medical ethics to medical students and physicians. Investigation regarding cost-effectiveness, student opinion, and understanding the degree of optimal curriculum integration of simulation to teach medical ethics is required to inform meaningful progress.

In conclusion, simulation can be used effectively to teach medical ethics, and may offer opportunities to enhance the undergraduate medical ethics curriculum, as it has begun to do so in nursing education. However, simulation is not an easy technique as it requires significant resources and effort. Judicious integration should be based on established evidence or promising innovative curriculum. There is need for research and experience in this novel application of simulation based education.

References
INSIGHTS IN PUBLIC HEALTH

The Hidden Epidemic: Sexually Transmitted Diseases in 2014

Alan R. Katz MD, MPH

Insights in Public Health is a monthly solicited column from the public health community and is coordinated by HJMPH Associate Editors Jay Maddock PhD from the Office of Public Health Studies at John A Burns School of Medicine and Donald Hayes MD, MPH from the Hawai`i Department of Health in collaboration with HJMPH Manuscript Editors Tonya Lowery St. John MPH and Ranjani Starr MPH from the Hawai`i Department of Health.

Abstract

Diseases caused by sexually transmitted agents are among the most common infectious diseases in the United States. Sexually transmitted diseases (STDs) have serious sequelae including physical pain, emotional distress, adverse reproductive outcomes, and cancer. They also pose an economic burden on society. STDs are challenging to prevent and control due to a general reluctance to address sexual health issues in an open manner. Human papillomavirus infection, chlamydia, and gonorrhea have recently been addressed by the Centers for Disease Control and Prevention in their Grand Rounds series reflecting their high-profile status on the national prevention and control agenda. This Insights column will focus on these three STDs.

Introduction

Sexually transmitted infections (STIs) are among the most common infections in the United States (US) and pose a significant public health challenge for prevention and control. Human sexuality is a politically and emotionally charged topic. Differing viewpoints on acceptable sexual practices can hinder and undermine effective prevention and control efforts. There are an estimated 110 million prevalent STIs in the US. Of these, approximately 20 million new infections occur annually, and half of all new STIs are acquired by men and women aged 15-24 years. Young women are at greatest risk for the sequelae of untreated STIs including pelvic inflammatory disease and reproductive consequences. Researchers from the US Centers for Disease Control and Prevention (CDC) have recently estimated total lifetime direct costs for incident cases of selected STIs. Chlamydia and gonorrhea costs were estimated at 517 and 162 million dollars respectively. These cost estimates included diagnosis and treatment of the infection and sequelae such as pelvic inflammatory disease and epididymitis. Human papillomavirus (HPV) infections were estimated to cost 1.7 billion dollars related to treatment of adverse HPV-associated health outcomes including precancerous cervical lesions, cervical and other anogenital cancers, and genital warts. These estimates did not consider the costs of adverse reproductive outcomes including miscarriage, ectopic pregnancy, infertility, or neonatal infections. They also did not consider indirect costs (eg, productivity loss) or intangible costs (eg, pain and suffering). Hence the true economic burden is substantially higher. This perspective will focus on HPV, chlamydia, and gonorrhea.

HPV

Infection with HPV is considered the most common STI in the US. The most recently published population-based prevalence data from the National Health and Nutrition Examination Surveys (NHANES), 2007-2010, revealed approximately 40% of women aged 14-59 years were infected with HPV with the highest prevalence (an alarming 59.8%) among 20-24 year olds. A highly effective HPV vaccine was introduced in 2006 and the CDC’s Advisory Committee on Immunization Practices (ACIP) recommended routine vaccination of 11-12 year old females (with catch up vaccination for 13-26 year olds) since June 2006. Recommendations were extended to males (routine immunization of 11-12 year olds with catch up vaccination for 13-21 year olds) in 2011. Unfortunately, vaccine coverage rates for the HPV vaccine have remained low. The latest CDC data from 2012 reveal that only about one third of 13-17 year old females have completed the 3 dose immunization series. Coverage rates for males are even lower: only 6.8% have completed the immunization series. Despite low coverage, there is already evidence that the vaccine is working. The latest NHANES data show a statistically significant decrease in HPV infections in 14-19 year old females. Data from Australia which has a free, school-based, nationally funded quadrivalent HPV vaccination program and phenomenally high coverage rates (73% of their primary target group of 12-13 year old females completed the 3 dose immunization series) have demonstrated near disappearance of external genital warts among young women five years into the program. The effectiveness of the quadrivalent vaccine is expected to translate into dramatic declines in cervical cancer rates in the future. Why is coverage so low in the US? Cost was listed as the most frequently reported barrier to HPV vaccination in a recent systematic review. While most insurance plans do cover the HPV vaccine, for those who lack insurance or have plans which do not cover the HPV vaccination, out-of-pocket co-payments can be high. Implementation of the Patient Protection and Affordable Care Act of 2010 should address the cost issues as all ACIP recommended vaccines will be offered at no cost to insurance beneficiaries. There have been concerns expressed that vaccinating young girls against an STI could promote high risk behaviors. Well-designed studies
of vaccinated girls have not substantiated these concerns.\textsuperscript{10,11,12} Others have expressed fear of adverse vaccine events. Evidence based data have shown the HPV vaccine to be safe. Nationally, adverse vaccine related events are monitored by the Vaccine Adverse Event Reporting System. Approximately 56 million doses of the quadrivalent HPV vaccine have been distributed as of March 2013 and no significant increase in adverse events has been observed.\textsuperscript{9} Currently, the key clinical and public health leadership agencies recommend routine immunization of boys and girls against HPV. In addition to the CDC, this includes the US Preventive Services Task Force (USPSTF), American Academy of Pediatrics, American College of Obstetricians and Gynecologists, and the American Academy of Family Physicians. The CDC recently categorized low coverage rates for the HPV vaccine as being a “high profile issue in public health science, practice, and policy,” and addressed this topic as a “Grand Rounds” presentation.\textsuperscript{9} The presentation concludes with: “The burden and cost of HPV-associated disease and cancer remain an important public health problem. Reducing the burden of HPV-associated cancer and disease through vaccination requires an integrated approach that includes clinical medicine, public health, and public policy.”

Chlamydia
Chlamydia is not only the most common nationally notifiable sexually transmitted disease (STD) in the US;\textsuperscript{13} it is the most common notifiable infectious illness in both the US\textsuperscript{14} and European Union.\textsuperscript{15} Chlamydia infection rates are highest in men and women 15–24 years of age.\textsuperscript{13} In 2011, 1.4 million cases of chlamydia were reported to the CDC and this was notable as being: “the largest number of cases ever reported to CDC for any condition.”\textsuperscript{14} As most cases of chlamydia are asymptomatic (approximately 70% of women and 50% of men),\textsuperscript{16} screening at-risk populations is a key control strategy. Both the CDC and USPSTF recommend annual screening of all sexually active females under 25 years, and chlamydia screening is categorized by the USPSTF as an “A-rated” recommendation. Undiagnosed and untreated chlamydia infections are a leading preventable cause of infertility.\textsuperscript{17} The National Commission on Prevention Priorities has listed chlamydia screening of sexually active females under 25 years as one of the 10 most beneficial and cost-effective prevention services.\textsuperscript{18} It is also one of the most underutilized. The most recent national statistics from the Healthcare Effectiveness Data and Information Set (HEDIS) showed that less than 50% of sexually active women under 25 years enrolled in commercial healthcare plans were being screened for chlamydia.\textsuperscript{19} Chlamydia has also been addressed in the CDC’s Grand Rounds series.\textsuperscript{17} The presentation concludes with: “To break the cycle of chlamydia transmission in the United States, health-care providers should encourage annual chlamydia screening for all sexually active females aged <25 years, maximize use of effective partner treatment services, and rescreen infected females and males 3 months after treatment.”\textsuperscript{17} Once an infected person is identified it is imperative to treat her or him and her or his sexual partner(s) to break the chain of transmission and decrease the risk of reinfection. The use of expedited partner therapy (EPT) has demonstrated clinical efficacy in both enhancing partner treatment and decreasing reinfection rates and has been endorsed and recommended by both the CDC and the American College of Obstetricians and Gynecologists. EPT is the process by which a patient is provided with either antibiotics or a prescription for antibiotics for her or his partner without having a healthcare provider first examine the partner. EPT is currently permissible in 35 states and “potentially allowable” in 9 states.\textsuperscript{20} Hawai’i enacted legislation in July 2013 allowing for the use of EPT.

Gonorrhea
Gonorrhea is the second most common reported STD and the second most common nationally notifiable disease.\textsuperscript{14} While gonorrhea rates have been decreasing steadily since the 1980s, antimicrobial resistant strains have been increasing at an alarming rate.\textsuperscript{15} Penicillin was the recommended treatment for gonorrhea in the 1950s, however resistance to both penicillin and tetracycline has been widespread since the 1980s.\textsuperscript{21} Fluoroquinolones, like ciprofloxacin, were a recommended oral treatment for gonorrhea in 2006, but resistant strains were first identified in the United States in the early 2000s and became widespread by 2007. The CDC has recommended against the use of fluoroquinolones to treat gonorrhea since 2007.\textsuperscript{22} This left cephalosporins as the sole antibiotic class for gonorrhea treatment.\textsuperscript{22} National surveillance of gonococcal isolates has recently revealed an increasing trend of isolates with decreased susceptibility to oral third generation cephalosporins, and as of August 2012, the CDC has recommended against their use. Of note, the largest increases were observed in Hawai’i: from 0% in 2006 to 17% in 2009.\textsuperscript{23} The CDC’s updated recommendation for gonorrhea treatment lists ceftriaxone (an injectable third generation cephalosporin) as the sole recommended cephalosporin.\textsuperscript{23} To mitigate emerging resistance to ceftriaxone, the recommended dosage was doubled from 125 mg to 250 mg and a second antibiotic to be taken simultaneously (azithromycin 1 gram or doxycycline 100 mg twice daily for one week) was added to the recommended therapeutic regimen.\textsuperscript{23} The first case of multidrug resistant gonorrhea with frank resistance to ceftriaxone was identified in Japan in 2009.\textsuperscript{24} Since then ceftriaxone resistant isolates have been identified in France,\textsuperscript{25} Spain,\textsuperscript{26} Sweden,\textsuperscript{27} Slovenia,\textsuperscript{28} and Australia.\textsuperscript{29} Grave concerns about the possible emergence and spread of an untreatable strain of gonorrhea have been recently voiced by both the CDC\textsuperscript{30} and the World Health Organization.\textsuperscript{31}

Conclusions
The National Academy of Sciences’ Institute of Medicine published a landmark report in 1997 entitled: The hidden epidemic: confronting sexually transmitted diseases. A quotation from this report is a fitting closure for this column: “STDs are hidden epidemics of enormous health and economic consequence in the United States. They are hidden because many Americans are reluctant to address sexual health issues in an open way...”
and because of the biologic and social characteristics of these diseases. All Americans have an interest in STD prevention because all communities are impacted by STDs and all individuals directly or indirectly pay for the costs of these diseases."

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References


Table. CDC Vaccination, Screening, and Treatment Recommendations

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<th>HPV</th>
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<tr>
<td>Routine vaccination of all 11-12 year olds (girls and boys) with catch up immunization for all girls/women through age 26 years and all boys/men through age 21 years. Men who have sex with men should be vaccinated through age 26 years. Vaccine may be given starting at age 9 years.</td>
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<th>Chlamydia</th>
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<td>Routine screening for all sexually active females under age 25 years. Treatment with single dose oral azithromycin (one gram) or one week course of doxycycline (100 mg orally twice a day).</td>
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<th>Gonorrhea</th>
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<tr>
<td>Treatment with 250 mg ceftriaxone intramuscularly as a single dose plus single dose oral azithromycin (one gram) or one week course of doxycycline (100 mg orally twice a day).</td>
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FAULT IS ONE THING. RESPONSIBILITY IS ANOTHER.
After an injury on the job, a man with a knee injury was brought to the Baltimore St Agnes Hospital emergency room for evaluation. Following triage, he was sent to the emergency treatment unit where a nurse practitioner diagnosed a “knee sprain.” The NP ordered an X-ray and sent the patient home, despite his complaint of severe pain. He returned to St. Agnes two days later with leg numbness and continued pain. Examination revealed a total loss of all ligaments in the joint and absent pulses below the knee. The tissue could not be revitalized and amputation was necessary. A malpractice complaint against St Agnes, the orthopedist supervisor, and NP resulted in a jury award of $5.2 million. The size of the award appears excessive, but it could represent a jury penalty for a medical care system that failed.

IN WHISTLE-BLOWER SUITS, WINNING IS EVERYTHING.
The General Motors (GM) vehicle ignition failure is turning out to be much larger than first indicated. Stalling, loss of power steering, power brakes and airbags has resulted in 13 recorded deaths and 54 known crashes, but the number could grow much larger. GM has recalled over 20 million cars and trucks and exceeded Toyota’s previous record recall numbers. Especially disgraceful for GM, is that the defects were known over 12 years ago. Courtland Kelley, a top GM safety inspector, was obliged to file a whistle-blower lawsuit when his superiors refused to act on his report. His suit was dismissed on procedural grounds. Although he lost, Kelley believed his action would encourage others at GM to report problems. No, the exact opposite occurred. Others at GM saw how Kelley was pushed aside into a meaningless job. They stated they were afraid to risk demotion or dismissal. GM must recognize that the employee who feels a need to file a suit, isn’t the problem.

OOOH, HOW NICE AND BROWN YOU ARE!
The Food and Drug Administration (FDA) wants to scare teenagers away from tanning salons. A black box safety warning will be required stating that tanning booths, ultraviolet tanning lamps and similar skin-browning products should not be used by people under age 18. The FDA’s action does not prohibit tanning salons from serving people under age 18. Some states have already issued such a ban and the American Academy of Dermatology wants Congress to take that step. The Academy found that people exposed to indoor tanning products and their U-V radiation have a 59% increase in risk of melanoma. A federal survey showed nearly one-third of high school senior girls use indoor tanning equipment. Moreover, National Cancer Institute statistics show a fairly consistent rise in melanoma among girls and women since 1975. It all adds up to a fairly tepid FDA warning considering the numbers and severity of melanoma.

IT’S SMOKING DOWN AND THUMBS UP.
The good news is that US high school students are smoking and drinking less at least according to a recent government survey. Smoking a cigarette in the previous 30 days was admitted by 15.7%, down from 18.1% in 2011. Nationwide, 34.9% had at least one alcoholic drink in the previous 30 days, down from 38.7% just 2 years ago. The bad news is that texting while driving is rampant. Some 41.4% of students admitted they had texted or e-mailed while driving at least once during the previous month. South Dakota topped the survey with 61.3% and Massachusetts had the lowest rate at 32.3%, showing a widespread pattern of risky behavior.

REVISITING A COST BENEFIT ANALYSIS.
The Food and Drug Administration (FDA) will conduct a hearing in Washington, D.C. in July to determine the outcome of a possible ban on the morcellator. The device is used in minimally invasive pelvic surgery for hysterectomies and fibroid surgery. The tool slices up tissue that can be removed through tiny incisions. Estimates are that morcellators are used in 50,000 cases per year with excellent outcomes. The downside is that one in 350 procedures will excise a uterine or ovarian sarcoma, often with fatal spread and death. The FDA issued a warning in April to discourage gynecologists. Johnson and Johnson, the primary U.S. maker of morcellators, promptly halted sales and is awaiting guidance from the FDA. The FDA okayed them for sale in the 1990s, and a ban of an approved medical device is considered a radical move. The FDA has only done it once, for artificial hair implants.

UNFORESEEN PROBLEMS FOLLOW WHEN CLEARING THE SMOKE-FILLED ROOM.
Colorado voters thought it would be a useful legal addition to establish outlets for recreational marijuana, including edibles. The law requires sellers to clearly label their products and limit the amount of pot in each portion to contain about the same amount as a joint. Problems have occurred because the packaged treats look too much like children’s snacks. Medical facilities received 79 calls of toxic events during the first four months of the year, double the number of the previous period. Seven involved children. Maureen Dowd, New York Times op-ed writer, described her mistake in eating a whole candy bar that sent her into a prolonged period of physical collapse and wild hallucinations. Unlike puffing marijuana, edibles are slow to take effect. Inexperienced users are likely to consume more of the drug-laced bar after not feeling instantly high, a problem that should have been predicted. In March a 19-year-old Wyoming college student jumped to his death from a Denver hotel balcony after eating a commercially made cookie containing 65 milligrams of THC. The label said it contained 6 and 1/2 servings. When Colorado opened Pandora’s box it should have considered including better instructions on using the contents.

COMING SOON—A MUST STOP ON YOUR ICELANDIC TOUR.
The Huffington Post calls it the Louvre of penises. In 1997 in Reykjavic, Iceland, the Icelandic Phallological Museum was founded. On display are 300 penises and penile parts of 93 different animals, but so far, it lacks an exhibit-worthy human organ. Help is on the way. Jonah Falcon, a New York City D-list celebrity has accepted an invitation to donate (after he dies) his 13 1/2 inch penis to the museum. Apparently shy, he refuses to appear in pornography, but looks on the museum as a higher calling.

ADDENDA
- Measles, virtually eliminated in the United States. 14 years ago, is resurging with 288 cases reported in 18 states as of May 23. All were unvaccinated.
- Denver International Airport is larger than the entire city of Boston.
- A Girl Scout sold 117 boxes of cookies in 2 hours when she set up a table outside a San Francisco marijuana dispensary.
- If it weren’t for electricity we would all be watching television by candle light.
- The United States has a new weapon. It destroys human beings, but leaves buildings intact. It’s called the stock market.
- Exhaustipated: an adjective describing those seniors “Too tired to give a s--t.”

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(Editorial comment is strictly that of the writer.)
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