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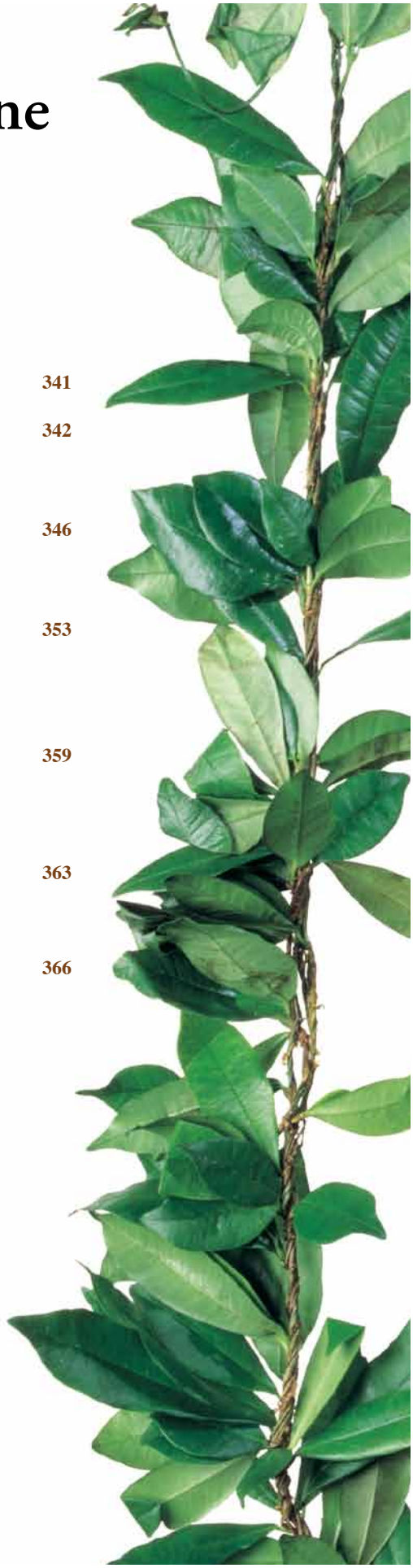

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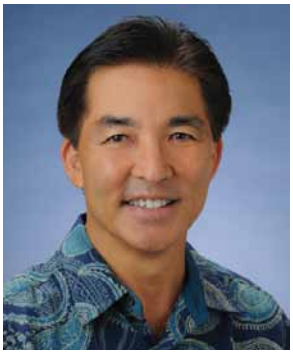

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Symptomatic Hibernoma: A Rare Soft Tissue Tumor

Daniel C. DeRosa DO; Robert B. Lim MD; Kevin Lin-Hurtubise MD; and Eric A. Johnson MD

Abstract

Hibernomas are benign soft tissue tumors containing prominent brown adipocytes that resemble normal brown fat. Hibernomas have not been associated with malignant potential; however, they are similar in clinical presentation to malignant tumors like liposarcomas. This article describes the clinical, radiographic, and histologic features of a patient with a hibernoma arising from the left superior flank.

Keywords

Soft tissue tumor, hibernoma, brown fat

Introduction

Classic lipomas histologically resemble white fat and are among the most common soft tissue tumors. The most frequently reported site of hibernoma location is the back, specifically the inter-scapular area. Other common sites include the neck, axillae, thigh, and intra-thoracic area. They generally present with tenderness when the tumors growth compresses surrounding structures.[1]

Hibernoma is a lesion whose indistinguishable nature, both clinically and radiographically, from malignant tumors, emphasizes the importance of its inclusion in the differential diagnosis.

Case Report

A 24-year-old obese man with a body mass index of 44.5 presented to the emergency department in September 2011, with two-month duration of pain and tenderness in his left superior flank. Patient stated he first noted the lump while at work several months prior to presentation. Since that time, it progressively increased in size with tenderness ranging from a persistent dull ache to an intense sharp pain. The patient denied any history of recent trauma. Otherwise the patient is in good health and has no other significant past medical history.

His physical examination revealed a large, painful, intramuscular 8cm diameter mass present in the left superior flank. The mass was not adherent and relatively mobile. It was not pulsatile. No erythema or overlying skin changes were appreciated. His abdominal exam was normal.

A non-contrast Computed Tomography (CT) scan revealed a left upper quadrant mass in the area correlating with the physical exam. Imaging was consistent with a lipoma, measuring 7.45 cm x 7.73 cm nevertheless a liposarcoma could not be ruled out, due to large size, and lack of complete homogeneity and fatty attenuation (Figure 1A and 1B). No bone or chest wall invasion was demonstrated; however the mass was identified to be located between the internal oblique and transversus abdominus muscles.

Incisional biopsy was considered, however, given the size, location, the extent of the patient's symptoms, and the confidence in attaining clear margins, the patient was scheduled for an open excisional biopsy under general anesthesia. Intra-operatively, the mass was freed using blunt dissection. The mass was found to be much larger than radiographically demonstrated. Extreme care was taken not to disrupt the thin capsule. The mass was measured to be approximately 12 cm x 11 cm x 8 cm. No obvious invasion into adjacent structures was noted. On pathological examination the specimen was found to have scattered brown fat cells amid white fat. There were no areas of necrosis or mitotic figures identified. However, there were broad fibrous septae with entrapped skeletal muscle. Initially the specimen was identified as a lipoma; nonetheless because of the anatomical position, growth, and histologic findings, a well-differentiated liposarcoma remained in the differential diagnosis. The specimen was sent to the Joint Pathology Center for review.

Microscopic examination demonstrated composition of round, polygonal, multi-vacuolated brown fat cells, with abundant mature adipose cells. The sample also included several small branching capillaries. No significant adipocytic atypia was encountered. There was mild focal septal hypercellularity that was considered reactive and non-atypical. The fat extended into the tissue edges (Figure 2). The tumor was diagnosed as a brown fat tumor consistent with a hibernoma.

The patient tolerated the procedure very well. He was discharged home in good, stable condition the same day. The patient followed up in General Surgery clinic twelve days later for post-operative discussion of surgery and findings. The patient denied having the left flank pain, tenderness, and fullness described pre-operatively.

Discussion

A hibernoma is a rare, benign, soft tissue tumor arising from vestiges of brown fat resembling that in certain hibernating animal species. It is usually a small, benign, lobulated, nontender lesion, occurring on the mediastinum or intrascapular region.[1] The tumor was first described by Merkel in 1906.[2] The lesion was described as being composed of brown adipose tissue. In 1914, Gery described the similarity of morphologic features between these tumors and the hibernating glands of animals.[3] Hibernomas generally occur in adults with a peak incidence in the third decade and with predominance in women. This report presents a case of a hibernoma of the left flank that was initially diagnosed as a lipoma, and subsequently investigated for suspicion of liposarcoma. The clinical presentation and imaging finding of a hibernoma can mimic those of benign lipomas and malignant processes.[4-5]

The imaging characteristics emphasize the often indistinguishable traits amongst hibernomas and lipomas, be it simple or atypical types, and malignant tumors like liposarcomas. Our imaging, specifically, led to an initial misinterpretation due to the size, enhancement, and the intramuscular location. On non-

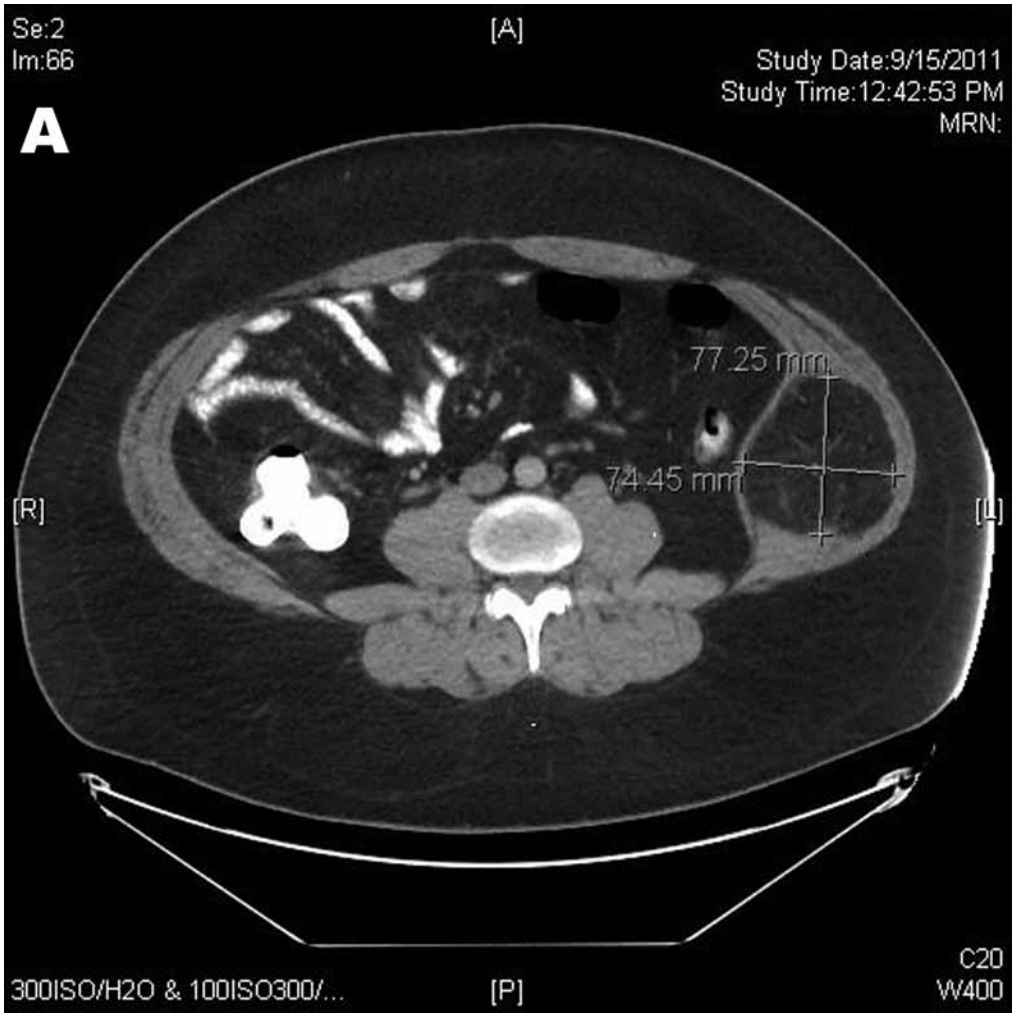

Figure 1A. Enhanced non-contrast CT demonstrating a large, intramuscular, well-defined, heterogeneous mass of the left flank.

contrast CT, a hibernoma may present as a well demarcated, low-attenuation mass with its density being relatively close to that of neighboring subcutaneous fat. Adding contrast usually results in a more radiographically enhanced lesion that may reveal septa and other nonspecific densities not appreciated on non-contrast CT. The CT images in Figure 1A and 1B, demonstrate a heterogeneous, defined, intra-muscular mass, with several curvilinear densities throughout.

Magnetic Resonance Imaging (MRI) can yield a large differential diagnosis for lipomatous tumors. Imaging can vary in relation to the proportional components of white and brown fat within the hibernoma.[4-7] This can affect both signal intensity and appearance of homogeneity. Hibernomas are classically described as having increased signal in both T1 and T2 weighted images. On T1 weighted imaging, hibernomas may be less intense when compared to subcutaneous tissue. If these MRI findings are appreciated, they help to distinguish a hibernoma from a simple lipoma, however, it does not necessarily rule out a well-differentiated liposarcoma.

Positron Emission Tomography (PET) has been used to demonstrate increased uptake of hibernomas, due to high metabolic activity of brown adipose tissue.[7-8] Because PET scans are used to identify areas of increased metabolism and all adult humans have some areas of functionally active brown fat that can cause increased uptake, this diminishes the potential for its use as a diagnostic imaging tool. However, the use of PET-CT in some literature, has found that the amount of brown adipose tissue is inversely proportional to an individual's body-mass index.[7] The patient referenced in this case report has a body mass index of 44.5. Thus, this information not only suggests a role of brown adipose tissue in human metabolism as reported, but makes the description of this hibernoma more unusual.

The pathology of hibernoma has been reported in the literature.[1,6,9] Macroscopically, hibernomas are well defined, soft, and usually mobile. Depending on lipid concentration, the hibernomas range in color from light brown to gray, with thin capsules. Microscopically, the tumor is characterized by large multi-vacuolated cells with abundant mature adipose cells, sev-

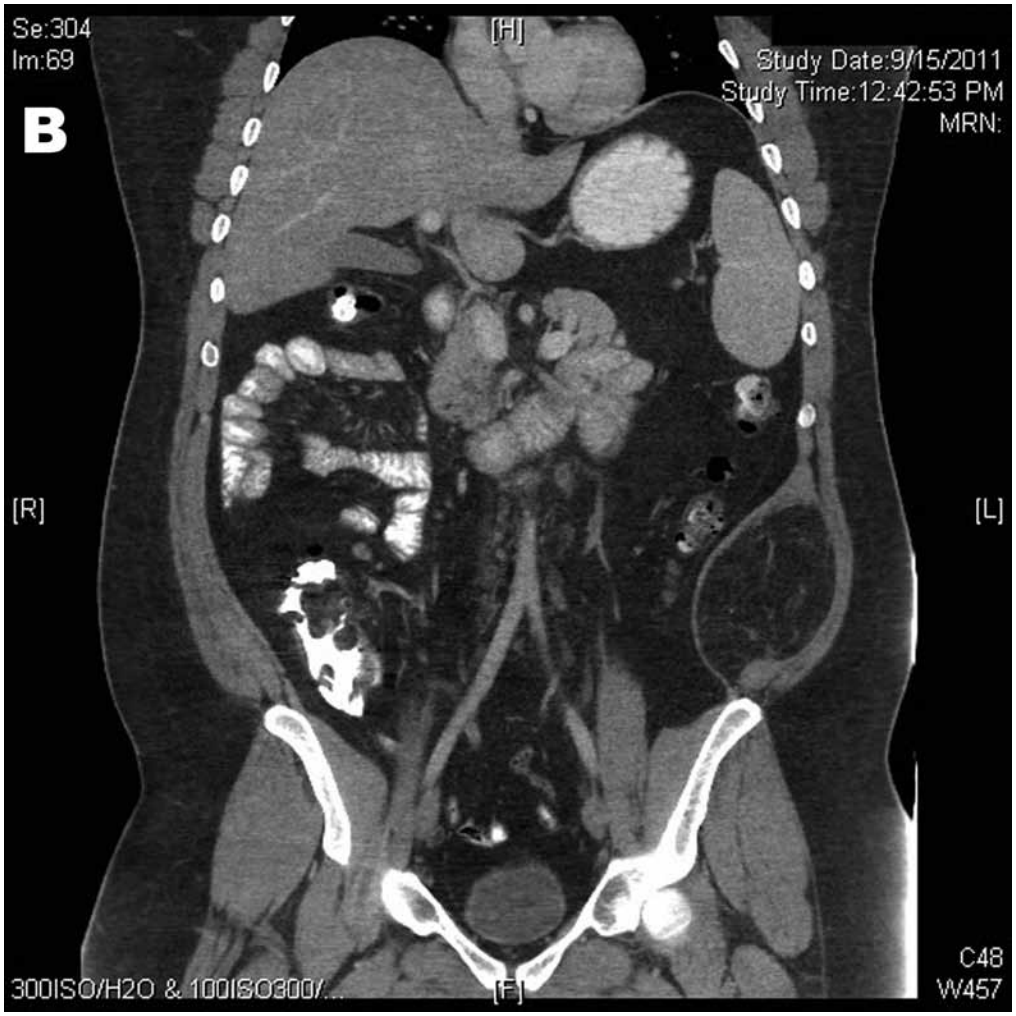

Figure 1B. Enhanced non-contrast CT demonstrating a large, intramuscular, well-defined, heterogeneous mass of the left flank.

eral small branching capillaries, and no significant adipocytic atypia (Figure 2).

Hibernomas are traditionally regarded as benign tumors with no potential for malignancy. Due to the indistinguishable nature of hibernomas both clinically and radiographically from malignant tumors, they should be present in the differential diagnosis. Treatment for symptomatic hibernomas is surgical intervention. Preoperative biopsy may be appropriate in an asymptomatic lesion; however, surgical excision of this soft tissue tumor is a sufficient and curative treatment, with excellent postoperative prognosis. This paper echoes the importance of incorporating hibernomas in the differential diagnosis.

Abbreviations

TAMC, Tripler Army Medical Center, ED, emergency department, CT, computed tomography

Disclosure/Disclaimer

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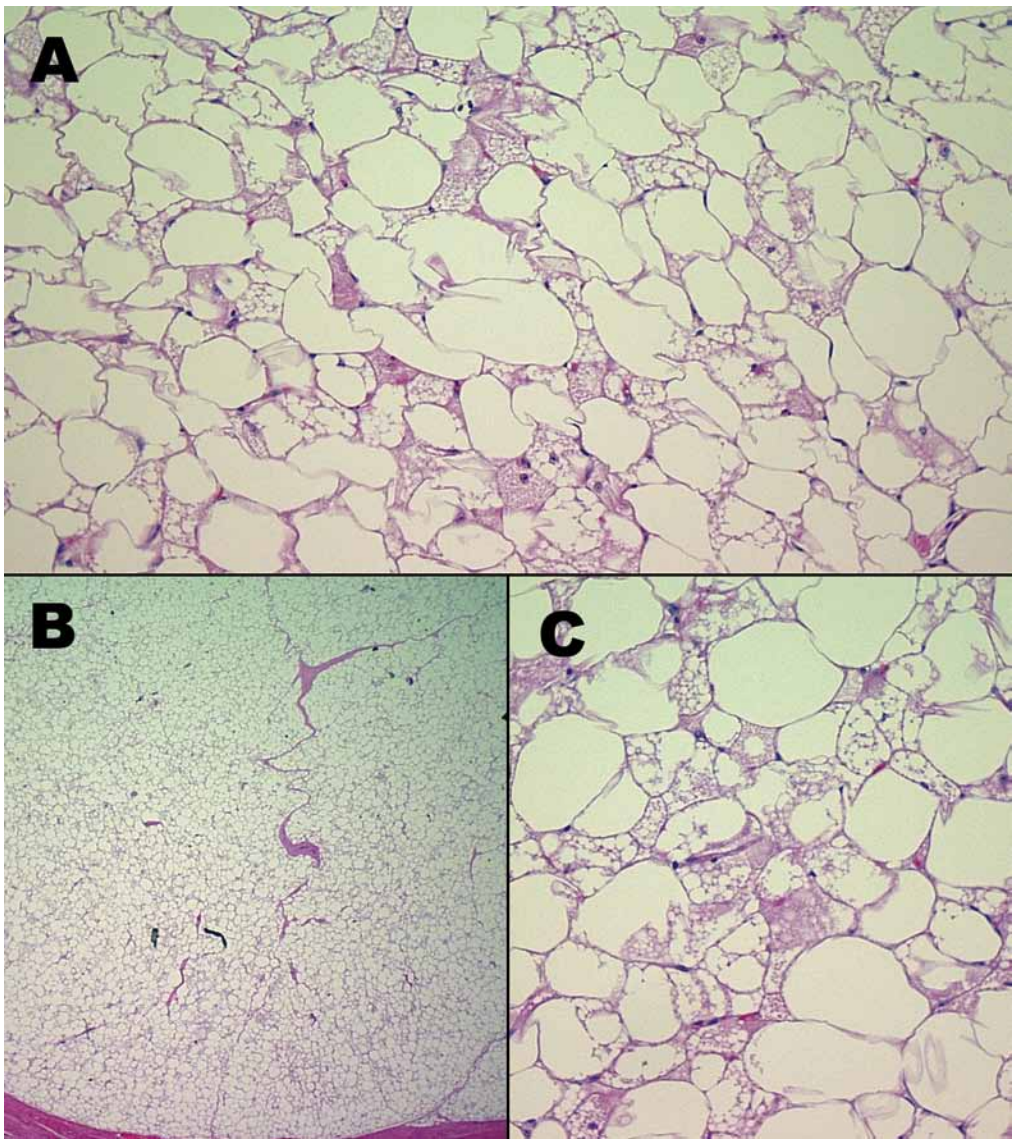

Figure 2. Appearance of the tumor in light microscopy. It is composed of mature adipose cells (A) diffusely throughout specimen. Round or polygonal, multivacuolated cells (B). Atypia of nuclei or mitotic activity are not seen. There are small vessels in these tissues (C).

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Discrimination and Obesity Among Native Hawaiians

Laurie D. McCubbin PhD and Mapuana Antonio BS

Abstract

Among ethnic populations in Hawai'i, Native Hawaiians continue to be over-represented with the highest rates in: morbidity and mortality, chronic health conditions, and the health risks of being overweight and obese. Focused on these two health risks, the investigation reported in this article has a specific aim of empirically determining whether social stigma as manifested in the form of perceived overt or covert discrimination is a contributing factor. Current studies focused on select ethnic populations, particularly African Americans point to discrimination as an important but understudied predictor of adverse health outcomes. Acknowledging the paucity of research on discrimination and its role in the health of Native Hawaiians, this investigation utilizes data from the 2007 Hawaiian Health Survey which was coordinated by the Department of Health, and the Office of Health Status Monitoring and implemented by SMS Hawai'i. The weighted sample of Hawai'i adults included measures of race/ethnicity and of everyday discrimination and the BMI (Body Mass Index). Logistic regression analyses were applied to determine if: (a) discrimination was significantly related to being overweight and/or obesity; and (b) whether this relationship remained a salient predictor after key demographic factors of gender, age, education, income, and length of time in the Islands were taken into account. This study confirmed the negative influence of overt discrimination as well as the protective nature of covert discrimination in explaining the variability in obesity/overweight in Native Hawaiians. The implications of this study for strategic interventions and research are discussed.

Keywords

Native Hawaiian, Overt/Covert Discrimination, Health Risk, Obesity/overweight, HHS

Introduction

Native Hawaiians have one of the poorest health statuses compared to all ethnic groups in the State of Hawai'i.[1] A leading factor affecting these health disparities is the prevalence of being overweight or obese. In 2009, the Hawai'i Department of Health[2] pointed to the alarming statistic that Native Hawaiians had a prevalence rate of 69.6% for being overweight or obese. In complementing the national interest and scientific effort to identify contributors to these specific health risks, this investigation has specifically aimed to empirically determine if social stigma as manifested in the form of perceived overt or covert discrimination is a unique contributing factor to health risks for indigenous Hawaiians. This investigation attempts to address contributing factors to the health risk of Native Hawaiians, an indigenous and ethnic population with life experiences of colonization accompanied by loss of culture, identity, and sense of place. The goal is to determine if discrimination may explain the variability in these health risks. Additionally this study applies a discrimination measure to the Native Hawaiian population and provides the respective psychometric properties associated with this indigenous group.

Health Risks, Discrimination, and Native Hawaiians

For the past few decades, Native Hawaiians struggled with multiple health disparities. Studies continue to associate Native Hawaiians with higher death rates compared to the nation and deaths at younger ages compared to other ethnic groups in the nation and the state of Hawai'i.[3-5] A leading cause for higher death rates includes increased rates of obesity and obesity-related diseases.[3-9] Common obesity-related diseases include hypertension, diabetes, asthma, and cardiovascular disease.[5,8,9] Health disparities[10] and shortened life expectancy have also been linked to social and demographic characteristics including age, socio-economic status, gender, geographical location/residence, and the self-identified race/ethnicity. Individuals born with social disadvantages (eg, lower social ranking status based on gender, race, and socioeconomic status) tend to develop more health problems than those born with more cumulative social advantages such as higher education, higher income, and being a member of the majority racial group.

Perceived racial or ethnic discrimination continues to receive attention as an understudied contributor to physical and mental health outcomes and health disparities among people of color.[11] The majority of prior investigations on perceived discrimination focused almost exclusively on major acute acts of subordination such as racial profiling. Over time, blatant acts against ethnic minorities have been suppressed or even eliminated, but acts of "everyday discrimination" persist, accompanied by adverse outcomes.[12] Everyday discrimination refers to minor, chronic, and daily experiences of interpersonal unfair treatment.[12] Several researchers found everyday discrimination to be a stronger predictor of physical and mental health status than assessments of major experiences of discrimination.[13-15] There is a growing body of research indicating that everyday discrimination adversely affects physical health.[16-20] For instance, in a 6-year follow-up study of African American women, women under the age of 50 who reported frequent experiences of everyday discrimination were at a significantly higher risk of developing breast cancer than those who reported infrequent experiences.[19] Additionally, everyday discrimination has been associated with higher levels of C-reactive protein, a marker of inflammation and well-known correlate of cardiovascular health among older African American adults even after controlling for other risk factors such as depression, smoking, heart disease, hypertension, and diabetes.[18] The linkage of everyday discrimination (EDS) to psychological stress, perceived racism, and internalized racism as factors affecting body mass index (BMI) levels including being underweight, normal weight, overweight or obese have also been confirmed.[22,23]

Studies often examine ways discrimination may directly affect obesity-related diseases, rather than a pathway through BMI levels.[17,25] Prior studies[22] underscore the importance of various types of stressors which can activate physiological consequences that play a role in health problems specific to general obesity, abdominal obesity, and obesity outcomes including high-blood pressure, depression, anxiety, sleep problems, and coronary calcification. A factor that may influence large amounts of

stress includes social disadvantages, which may be experienced through different stressors including racial discrimination and socio-demographic factors. The relationship between stress and health outcomes specific to abdominal obesity was demonstrated in an Afro-Caribbean population residing in Barbados.[22] After accounting for demographical characteristics, the researchers found a significant correlation between internalized racism and both abdominal obesity and blood pressure. Moreover, the researchers found higher BMI levels for individuals with higher levels of internalized racism. After adjusting for age and education, the association of being overweight for those who internalized racism was two times greater and the odds of having abdominal obesity was 2.8 times greater. In another study,[21] a positive relationship existed between discrimination and BMI levels within an Asian American population. Within this population, BMI levels were highest for those who reported weight discrimination, followed by racial discrimination, and finally, other types of discrimination within the everyday acts of discrimination scale. After adjusting for covariates such as socio-demographic characteristics, mental and physical illness, and social desirability bias, a significant positive relationship was found between racial discrimination and BMI.

In general, there remains a significant gap in the research, particularly studies examining indigenous populations and the impact of discrimination on health risk factors such as obesity or being overweight. Within indigenous research, a paucity of research exists on discrimination and health risk factors among Native Hawaiians.[25] This study also addressed a key methodological issue: the conspicuous paucity of the application of psychometric measures (eg, exploratory factor analyses, confirmatory factor analyses, tests of invariance, and reliability) developed for one population (African American) to other populations (Hawaiians).[26-28]

Methods

The researchers used a weighted dataset from the Hawai'i Health Survey (HHS) administered in 2007, which consisted of participants residing in the State of Hawai'i. This analysis focuses on respondents who self-identified their ethnicity as Native Hawaiian. The HHS is a landline telephone survey conducted by the Hawai'i Department of Health (DOH), Office of Health Status Monitoring (OHSM). The survey excludes persons living in group quarters, residents of the island of Ni'ihau, a privately owned island in Hawai'i, and homeless persons. The HHS measures demographic characteristics and the health status of Hawai'i's residents to provide data to monitor health status of the ethnically diverse population, with the intention of planning health services in Hawai'i, strategic design, and implementation of programs to ameliorate conditions that foster health risks and adverse health outcomes. The sample design is disproportionate by geography and survey data are statistically adjusted to match the geographic location and number of telephone lines, size of households and the age and gender of all household members.

The Native Hawaiian sub-sample is profiled (Table 1) as consisting of nearly an even distribution of men (46.6%) and women (53.4%) respondents with two-thirds represented by two age groups 34-54 years (40.7%) and over 55 years (25.5%). The majority (78.1%) of Hawaiians had annual household income represented by two groups ($35,000-$74,999; 38.0%) and those with incomes in excess of $75,000 (40.1%). The Hawaiians were nearly evenly divided between those with high school diploma (or GED) or less (52.0%) and those with college education or college degrees (48%). The majority (90.5%) of Hawaiian respondents have either lived in the state of Hawai'i in excess of 20 years (9.9%) or their entire lives (81.6%).

Table 1. Frequencies of the Demographic Variables for Native Hawaiians (Unweighted and Weighted Data)

	Unweighted Data		Weighted Data	
Demographic Variable	**N**	**Percent**	**N**	**Percent**
Gender: Men	118	32.2	69779	46.6
Gender: Women	249	67.8	80049	53.4
Age (Level 1: 18-34)	74	20.2	50621	33.8
Age (Level 1: 35-54)	152	41.1	60938	40.7
Age (Level 3: 55+)	141	38.4	38268	25.5
Income (Level 0: less than $35,000)	97	26.4	32798	21.9
Income (Level 1: $35,000-74,999)	134	36.5	56919	38.0
Income (Level 2: $75,000 or more)	136	37.1	60110	40.1
Education (Level 0: HS/ED or less)	180	49	77854	52.0
Education (Level 1: Some College)	111	30.2	40957	27.3
Education (Level 2: College Graduate or more)	76	20.7	31017	20.7
Years Living in Hawai'i (Level 0: 5 years or less)	5	1.4	5113	3.4
Years Living in Hawai'i (Level 1: 5 to 20 years)	14	3.8	7606	5.1
Years Living in Hawai'i (Level 2: 20+ years)	44	12	14818	9.9
Years Living in Hawai'i (Level 3: Lifetime)	304	82.8	122291	81.6

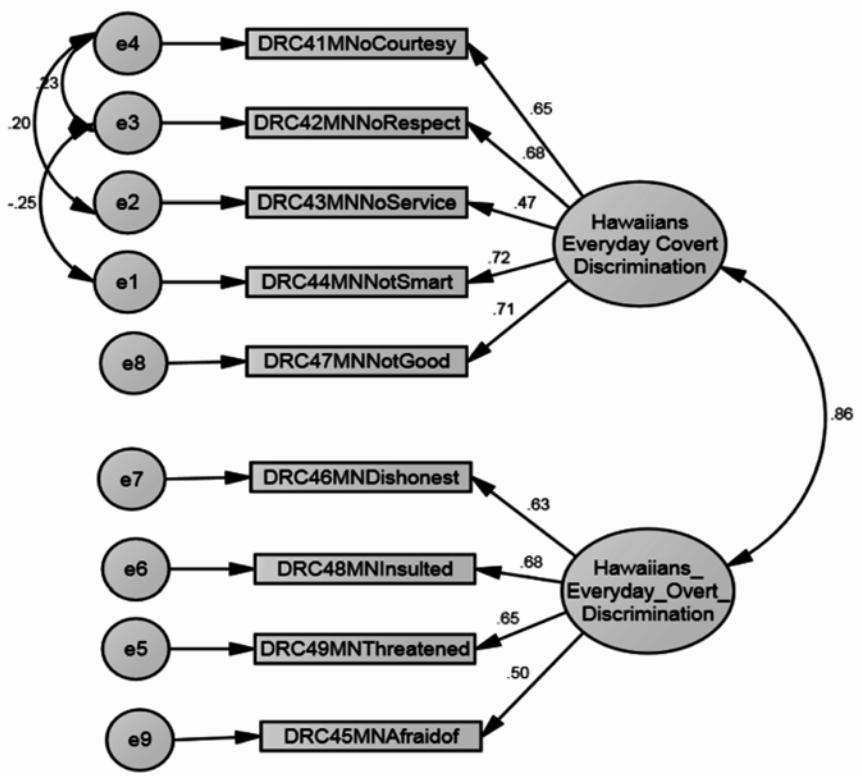

Figure 1. Confirmatory Factor Analysis of two factor model (overt and covert Discrimination) of Everyday Discrimination, Testing for Model Fit for Native Hawaiians (McCubbin, L. & McCubbin, 2012).*

*The numbers represent loadings (relationship between subscales and specific items for each subscale) and covariance coefficients (relationship between discrimination subscales and relationships among error terms.)

Measures: Discrimination and Criterion of Obese/Overweight

Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and Test of Invariance (validity confirmations) were adopted as core requirements for the use of EDS in this investigation. AMOS 19.0,[26] the IBM statistical program used in these analyses, requires the uses of unweighted data in the systematic analysis of the EDS (see Figure 1).

The Everyday Discrimination Scale (EDS),[25] adopted for this investigation, included 9 questions about the respondent's perceptions of and encounters with discrimination. The participants responded to a Likert-scale, ranging from never (1) to very often (5). Therefore, higher scores on the discrimination scale indicated a greater amount of everyday discrimination. The EFA revealed two latent variables (subscales) identified as overt and covert discrimination. The American Psychological Association[29] refers to two dimensions of discrimination as blatant prejudice (racism) and hidden prejudice (micro-aggressions)[29,30] respectively. The CFA[29] confirmed the "fit of the two latent variable model" supported by CMIN//DF OF 3.698 (P <.05, GFI = .978, AGFI = .966, IFI = .974, CFI = .974, RMSEA = .034 with a confidence interval of .029 and .039 and PCLOSE = 1.000). The Overt Discrimination subscale consists of four items: "perceptions of being dishonest, one to be afraid of, called names or insulted, and harassed or threatened." The Covert Discrimination subscale includes "receiving poorer service than other people at restaurants or stores, being treated with less respect than other people, being treated with less courtesy than other people, people act as if they think you are not as good as they are, and people act as if they think you are not smart." Both subscales demonstrated acceptable levels of reliability (Cronbach's Alphas of .79) and validated with an independent report of perceived racial discrimination.

Criterion Measure of Health Risk: Overweight or Obese

The BMI data were applied to the classification of Native Hawaiians into two categories:[31] (a) individuals who were considered underweight or normal (less than 18.5 kg/m^2 to 24.9 kg/m^2) (coded 0); or (b) overweight or obese (25.0 to more than 30 kg/m^2) (coded 1).

Results

The analysis focused on the results derived from the use of weighted data, a strategy intended to reflect a more accurate representation of Native Hawaiians in the State of Hawai'i and across the different islands. To address the two major questions for this investigation a two-model logistic regression analysis was conducted. The first model included the independent variables of gender, age, income, education level, and years in Hawai'i. The second model consisted of adding the two types of discrimination, overt and covert acts of everyday discrimination to Model 1 to determine their unique contribution to explaining

Table 2. Hierarchical Logistic Regression Examining Demographic Factors and Everyday Discrimination on Being Overweight and/or Obese Among Native Hawaiians (Weighted Data)

Variables in the equation	B	Wald	P	Odds Ratio	CI	
					Lower	Upper
Model 1						
Gender: Women (Reference)						
Gender: Men	1.00	5759.88	.00	2.73	2.66	2.80
Age (Level 0: 18-34)	-.88	3108.10	.00	.41	.40	.43
Age (Level 1: 35-54)	.25	262.25	.00	1.29	1.25	1.33
Age (Level 3: 55+) (Reference)						
Income (Level 0: less than $35,000)	.90	2498.41	.00	2.45	2.37	2.54
Income (Level 1: $35,000-74,999)	-.12	82.03	.00	.89	.86	.91
Income (Level 2: $75,000 or more) (Reference)						
Education (Level 0: HS/ED or less)	-.18	117.82	.00	.84	.81	.86
Education (Level 1: Some College)	-.26	209.82	.00	.77	.75	.80
Education (Level 2: College Graduate or more) (Reference)						
Years Living in Hawai'i (Level 0: 5 years or less) (Reference)						
Years Living in Hawai'i (Level 1: 5 to 20 years)	.13	10.03	.00	1.14	1.05	1.23
Years Living in Hawai'i (Level 2: 20+ years)	1.70	1880.43	.00	5.48	5.07	5.91
Years Living in Hawai'i (Level 3: Lifetime)	1.55	2219.05	.00	4.73	4.43	5.04
Model 2						
Gender: Women (Reference)						
Gender: Men	.77	3118.14	.00	2.16	2.10	2.22
Age (Level 0: 18-34)	-.92	3129.09	.00	.40	.39	.41
Age (Level 1: 35-54)	.14	78.71	.00	1.15	1.12	1.19
Age (Level 3: 55+) (Reference)						
Income (Level 0: less than $35,000)	.98	2839.09	.00	2.68	2.58	2.77
Income (Level 1: $35,000-74,999)	-.05	15.19	.00	.95	.92	.97
Income (Level 2: $75,000 or more) (Reference)						
Education (Level 0: HS/ED or less)	-.07	16.13	.00	.93	.90	.97
Education (Level 1: Some College)	-.21	130.85	.00	.81	.78	.84
Education (Level 2: College Graduate or more) (Reference)						
Years Living in Hawai'i (Level 0: 5 years or less) (Reference)						
Years Living in Hawai'i (Level 1: 5 to 20 years)	.34	70.05	.00	1.40	1.29	1.52
Years Living in Hawai'i (Level 2: 20+ years)	1.99	2501.92	.00	7.28	6.74	7.87
Years Living in Hawai'i (Level 3: Lifetime)	1.82	2988.54	.00	6.19	5.80	6.61
Overt Discrimination (low) (Reference)						
Overt Discrimination (moderate/high)	1.13	5640.63	.00	3.08	2.99	3.17
Covert Discrimination (low) (Reference)						
Covert Discrimination (moderate/high)	-.42	582.12	.00	.66	.63	.68

obesity/overweight. The results of this logistic regression are presented in Table 2.

In the logistic regression analysis of Model 1, inclusive of the demographic variables (age, education, income, and length of time in Hawai'i), revealed significant odds ratios for all, thus confirming their importance in explaining the variability in the Hawaiians' health risks of obesity/overweight. The analysis confirmed good model fit (Omnibus test of Model Coefficients ($\chi^2 = 20921.157$, $P = .0005$) with the demographic predictors combined pseudo R^2 indices to explaining between 13.0% (Cox & Snell pseudo R^2) and 18.3% (Nagelkerke pseudo R^2) of the variability in the criterion of obesity/overweight. The

classification analysis reveals that Model 1 is able to predict the correct category (obesity/overweight) for the respondents in 74.8% of the cases.

Of importance, however, within this set of predictors, the statistically significant demographic predictors varied in the nature of their association with their relationship to the criterion of being obese/overweight. Specifically, being male (OR=2.73), between the ages of 35 and 54 (OR = 1.29), having a household income of $35,000 or less (OR = 2.45), and living in the Hawaiian Islands 6-20 years (OR = 1.29) were positively related to being obese/overweight. In contrast, being female, in the age group of 18-34 (OR = .41), with a household income of $35,000-$74,999 (OR = .89), and having an education level of high school diploma or less (OR = .84) or some college education (OR = .77) was negatively related to obesity/overweight. The odds of a Hawaiian reporting being obese/overweight decreases by being a female, between the ages of 18-34, with a household income between $35,000 and $74,999 and having an education level of high school or less or some college experience.

Model 2 inclusive of overt and covert discrimination, while controlling for gender, age, education, household income and length of time living in Hawai'i, reveal the salience of both overt and covert discrimination in explaining the variability in Hawaiians reporting being obese/overweight. The logistic regression analysis of Model 2, revealed significant odds ratios for both overt and covert discrimination thus confirming their importance in explaining the variability in the Hawaiians' health risks of obesity/overweight. The analysis confirmed good model fit (Omnibus test of Model Coefficients ($\chi^2 = 26743.275$, $P = .0005$) with the demographic predictors combined pseudo R^2 indices to explaining between 16.3% (Cox & Snell pseudo R^2) and 22.9% (Nagelkerke pseudo R^2) of the variability in the criterion of obesity/overweight. The classification analysis reveals that Model 2 is able to predict the correct category (obesity/overweight) for the respondents in 75.7% of the cases. As was true for demographic predictors however, the nature of the influence of overt and covert discrimination varies. Overt discrimination (OR = 3.08) is positively related to obesity/overweight and thus a factor in promoting or reinforcing obesity/overweight, all other factors being equal. In contrast, covert discrimination (OR = -.66) is negatively associated with obesity/overweight and thus a predictor of not reporting being obese/overweight. The results of the logistic regression with unweighted data is included in Table 3 for comparative purposes. The logistic regression reveals significant odds being limited to two predictors. Specifically, household income of $35,000 or less (OR = 1.88) and overt discrimination (OR = 2.19) are the only statistically significant predictors.

Discussion

This investigation was framed as a study of stressors (discrimination) and their negative influence on health risks (obesity/overweight). The findings while supportive of this basic paradigm, suggests the value of reframing the investigation as a risk and protective factors paradigm, commonly associated with psychological theories of resilience represented by the classic works of Garmezy,[32] Rutter,[33] Werner & Smith,[34] and the sociological perspective of salutogenesis developed by Antonovsky.[35] Essentially, the findings suggest that explaining the variability in health risks of obesity/overweight of Native Hawaiians may be more fully understood and addressed as the combination and interacting influence of both risk and protective factors rather than a single negative causal influence of discrimination complemented by "controlling" other variables. On one hand the predictors of obesity/overweight represented by statistically significant and positive odds ratios, present an "at-risk" profile of Hawaiian men in the middle years between 35 and 54, with annual household income $34,000 or less, having lived in the Hawaiian Islands six years or more including a lifetime and confronted by moderate to high levels of overt discrimination. One could consider this cluster of predictors as that of a Hawaiian at-risk profile. The investigation also identified predictors of obesity/overweight, represented by statistically significant and negative odds ratios. They present a profile of Hawaiians with protective factors inclusive of being a woman, between the ages of 18 and 34, with an annual household income between $35,000 and $74,999, having a high school diploma or less education and some college, and confronted by moderate to high levels of covert discrimination.

The latter finding of covert discrimination — that for every incremental increase in covert discrimination the lower the probability of reporting being obese/overweight — deserves further discussion. This finding contradicts the commonly held notion that everyday discrimination has a negative impact on the health and well-being of persons of color living in a milieu in which racially based stigma may be a persistent part of life.[12] One simple methodological explanation may well be that the Everyday Discrimination Scale when applied as a whole without considering its underlying overt and covert dimensions, is dominated by the overt discrimination elements of the scale. It is also reasonable to argue that covert discrimination represented by items inclusive of "being treated with less courtesy, receiving poorer service than others, acting as if people think you are not smart" while pejorative in nature may be perceived as falling short of invasive and undermining the individual's self-worth, integrity and identity. It may also be viewed as a motivator to overcome adversity and stigma. Why it would be a protective factor may well be explained by the Hawaiians "search for meaning" to use Frankl's[36] concept of the ability to reframe negative life experiences into a constructive purpose to foster survival. In general these explanations remain unconfirmed and present challenges for future research.

While the HHS is one of the most valuable health surveys for Native Hawaiians in the State of Hawai'i, limitations are noted. First, the survey involved interview data collected via random selection of respondents using landlines and excluded individuals living in group quarters, residents of Ni'ihau, homeless persons, and Native Hawaiians (nearly half of the total Hawaiian population) who reside elsewhere and particularly on the continental United States. Even with application of

Table 3. Hierarchical Logistic Regression Examining Demographic Factors and Everyday Discrimination on Being Overweight and/or Obese Among Native Hawaiians (Unweighted Data)

Variables in the equation	B	Wald	P	Odds Ratio	CI	
					Lower	Upper
Model 1						
Gender: Women (Reference)						
Gender: Men	.45	3.03	.08	1.58	.94	2.63
Age (Level 0: 18-34)	-.44	2.02	.16	.64	.35	1.18
Age (Level 1: 35-54)	.36	1.74	.19	1.43	.84	2.43
Age (Level 3: 55+) (Reference)						
Income (Level 0: less than $35,000)	.60	3.51	.06	1.82	.97	3.41
Income (Level 1: $35,000-74,999)	-.07	.06	.81	.94	.56	1.58
Income (Level 2: $75,000 or more) (Reference)						
Education (Level 0: HS/ED or less)	.04	.02	.90	1.04	.56	1.95
Education (Level 1: Some College)	-.27	.69	.41	.76	.4	1.45
Education (Level 2: College Graduate or more) (Reference)						
Years Living in Hawaii (Level 0: 5 years or less) (Reference)						
Years Living in Hawaii (Level 1: 5 to 20 years)	-.16	.02	.88	.85	.10	7.10
Years Living in Hawaii (Level 2: 20+ years)	.46	.22	.64	1.59	.23	11.05
Years Living in Hawaii (Level 3: Lifetime)	.60	.41	.52	1.83	.29	11.41
Model 2						
Gender: Women (Reference)						
Gender: Men	.38	2.00	.16	1.46	.87	2.45
Age (Level 0: 18-34)	-.41	1.68	.20	.66	.36	1.24
Age (Level 1: 35-54)	.30	1.17	.28	1.35	.78	2.32
Age (Level 3: 55+) (Reference)						
Income (Level 0: less than $35,000)	.63	3.79	.05	1.88	1.00	3.55
Income (Level 1: $35,000-74,999)	-.02	.01	.94	.98	.58	1.67
Income (Level 2: $75,000 or more) (Reference)						
Education (Level 0: HS/ED or less)	.13	.16	.69	1.14	.60	2.16
Education (Level 1: Some College)	-.26	.62	.43	.77	.40	1.49
Education (Level 2: College Graduate or more) (Reference)						
Years Living in Hawaii (Level 0: 5 years or less) (Reference)						
Years Living in Hawaii (Level 1: 5 to 20 years)	.00	.00	1.00	1.00	.12	8.57
Years Living in Hawaii (Level 2: 20+ years)	.68	.47	.50	1.98	.28	13.95
Years Living in Hawaii (Level 3: Lifetime)	.83	.77	.38	2.29	.36	14.52
Overt Discrimination (low) (Reference)						
Overt Discrimination (moderate/high)	.78	8.27	.00	2.19	1.28	3.72
Covert Discrimination (low) (Reference)						
Covert Discrimination (moderate/high)	-.49	2.34	.13	.62	.33	1.15

weights intending to improve upon the representativeness of the population living in Hawai'i, in light of these limitations, generalizability of these findings to the total Native Hawaiian population would not be appropriate. A nationally representative sample of Native Hawaiians inclusive of those living on the continental US would be an appropriate follow-up study.

The study of discrimination and BMI as well as other heath indices merits an examination of within group comparisons focused on the multi-ethnic nature of Native Hawaiians. National statistics[37] point to the State of Hawai'i as having one of the highest concentrations of multi-ethnic individuals and marriages indicating the importance of an additional source of stigmatization and a host of additional contributing factors to health outcomes inclusive of obesity/overweight. The variables

of genetics, diet, historical trauma, cost of living, housing costs, to name a few, come into play in explaining the variability in these health risks for Indigenous Hawaiians, but were not included as part of this investigation.

These limitations should not distract from the findings of overt discrimination as an explanatory risk factor in being obese/overweight as an index of health risk. This finding gains importance in light of the population growth of Native Hawaiians, and the growing sentiment that the Hawaiians are adversely impacted by historical losses of identity, language, culture and land, and sense of place, all of which are important determinants as risk factors related to the health and well-being of this population. The pathways of discrimination to obesity deserve greater consideration in future research. While important to isolate and confirm the deleterious effect of discrimination, the psychological and social protective factors do come into play in reducing the adverse effects of the full range of social insults associated with discrimination.

Conflict of Interest

The authors identify no conflict of interest.

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Dietary Intake Among Native Hawaiian, Filipino, and White Children and Caregivers in Hawai'i

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Abstact

Little is published about dietary intake of children of ethnic populations found in Hawai'i, due to an absence of national statistics collected on Hawai'i's population. This information is needed to focus planning of food, agriculture and health programs aimed to prevent obesity and related chronic disease and to improve health. Dietary patterns of 156 Native Hawaiian (n=110), Filipino (n=28) and White (n=18) children and their caregivers were compared using socio-demographic, annual "food season," and 24 hour dietary recall data from a baseline survey of four lower income communities selected for an intervention program in rural Hawai'i. Ethnic differences were found in the Healthy Eating Index (HEI) dairy component, and in calcium and vitamin C nutrient intakes among caregivers only (adjusting for food season). Whites always had higher intakes of these foods and nutrients than Filipinos or Native Hawaiians. Vitamin C intake remained significantly different among ethnic groups after further adjusting for dairy food group intake. Dietary patterns showed low intake of fruits and vegetables, fiber and dairy foods among these understudied populations.

Introduction

The prevalence of obesity in the United States has more than doubled in the past three decades, and reveals ethnic disparity.[1,2] The Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) reported racial/ethnic disparity in obesity in US children as young as four years, with the highest prevalence of obesity found in American Indian/Native Alaskan children. Indeed, obesity has been found to be twice as common in American Indian/Native Alaskan children as in non-Hispanic White or Asian children.[3] There are few data on dietary intake of Native Hawaiian or Filipino children in Hawai'i, though available data from the Pacific region suggests diets of poor nutritional quality and children with high rates of obesity.[4] Dietary patterns of Native Hawaiian and Filipino populations are not described in national food consumption surveys, nor are such data routinely collected in Hawai'i. Therefore, the purpose of this paper is to examine the ethnic differences (Native Hawaiian, Filipino and White) in food group, nutrient and healthy eating index dietary components among 6-13 year old children and their caregivers in selected rural communities in Hawai'i where these ethnic groups predominate.

Methods

The study was approved by the Institutional Review Board at the University of Hawai'i at Manoa, and informed consent and assent were obtained. Health center personnel made the initial contact with eligible child-caregiver pairs, and scheduled study visits were in compliance with Health Insurance Portability and Accountability Act privacy rules. Through the fall of 2005 and summer of 2006, interviews were conducted at the health center or at the respondent's home, according to their preference and availability.

Participants were drawn from two rural sites on O'ahu and two sites on the Big Island of Hawai'i in the state of Hawai'i, selected for rural location and high proportion of Native Hawaiian population. On the island of O'ahu, child-caregiver pairs were selected from local health center patient databases. In these communities, eligibility criteria included: (1) Child had an encounter with the health care facility during the past 2 years, and (2) Child was 8-12 years old at the time of the pre-intervention survey interview.

For the two sites on the Big Island of Hawai'i, sampling was done according to census tracts.[5] A random cluster sampling technique was used to identify how many children from each census block would be recruited. Within the selected census block cluster, data collectors went systematically from door to door to obtain the specified proportion of respondents, until the desired sample was achieved. The overall response rate was 80%. In total, 183 child - caregiver pairs were interviewed.

Questionnaires were administered to both the caregiver and the child. There is a high level of ethnic mixing in Hawai'i. Thus, care- givers were asked the standard ethnic identity question, "What ethnic or racial group do you most identify with?" However, they were permitted to identify more than one group. The following ethnic groups were provided on the questionnaire: Native American, African American/Black, Chinese, Filipino, Japanese, Korean, Hispanic, Hawaiian/Part-Hawaiian, Other Pacific Islander, and White. The following algorithm was used to define ethnicity for the presented analyses:

- Native Hawaiian - if the subject checked Hawaiian/Part-Hawaiian. (However, this group could be mixed with other ethnic groups, which were White, Chinese, Filipino, Japanese, Korean, Hispanic, Pacific Islander, Native American or African American. Only Hawaiian ethnicity was reported by 85 of 110 individuals, while 18/110 reported one other ethnicity, six reported two other ethnicities and three reported three other ethnicities).

- Filipino - if the subject checked Filipino and did not check Hawaiian/Part-Hawaiian. (This group could be mixed with other ethnic groups which included White, Chinese, Japanese, Korean, Hispanic, Pacific Islander, Native American or African American. Filipino ethnicity only was reported by 22 of 28, while 6 of 28 reported one other ethnicity).

- White - if the subject checked White and did not select Hawaiian/Part-Hawaiian or Filipino. (This group could be mixed with the Chinese, Japanese, Korean, Hispanic, other Pacific Islander, Native American or

African American. However, no other ethnic group was reported for any White participant).

Twenty-seven child-caregiver pairs who did not meet the ethnic criteria for this analysis were excluded due to small sample size of that ethnic group (those who were either 100% Chinese, Japanese, Korean, Hispanic, other Pacific Islander, Native American, African American, or who they said they were mixed but were unable to specify the mixture). Thus, 156 child-caregiver pairs were included in the analysis (18 White, 28 Filipino, 110 Native Hawaiian). Among those who had specified the type of caregiver (144 out of the 156 caregivers), 82% (118 out of 144) were a parent.

A single 24-hour dietary recall was collected from each child and then from their caregiver using a modified USDA five-step multiple pass methodology.[6] Children were interviewed directly, but the assistance of caregivers was accepted when the child could not remember. To decrease the length of time for the food recall, time and occasion of food and beverage consumption were collected in combination with either the first or third step, yielding a four-step method. A simple set of measuring instruments and plastic food models was used to aid in quantification of amount consumed and a list of commonly "forgotten foods" was used as a prompt during the last stage of the recall. One-sixth of recalls were collected on Mondays, in order to include (recalled) weekend intake. All other recalls reflected weekdays. Data collectors were trained staff from the Healthy Living in the Pacific Islands, Healthy Pacific Child Project, and Healthy Foods Hawai'i Project at the University of Hawai'i at Manoa (Novotny R, PI). Healthy Eating Index (HEI) component scores were calculated for nine HEI components: grain, vegetables, fruits, dairy, meat, total fat, saturated fat, cholesterol, and sodium, with a score of 1-10 for each component.[7]

In addition, data for education and socio-demographic characteristics of the caregiver (birth date, sex, marital status, and years of education) were collected. The completed number of years of school and the employment status were recorded. If employed, the caregiver was asked for hours/week worked, which was classified as: 1 = Seasonally/Occasionally employed; 2 = Part time (less than 30 hrs/wk); 3 = 30–40 hrs/wk; 4 = More than 40 hrs/wk. Due to the high number of unemployed persons and the prevalence of bartering for goods in the community, a material style of living score developed for use in rural, semi-subsistence economies was computed to estimate socio-economic status based on ownership of various items (TV, car, microwave, etc) in working condition available in their household.[8]

To determine if the study samples were homogeneous, differences between the community of residence, material style of living, and caregiver education among the three ethnic groups were tested using Fisher's exact test in SAS (version 9.1.3, 2002-2003, SAS Institute Inc, Cary, NC) PROC FREQ.

Before performing statistical analysis, the data for dietary intakes were processed using the University of Hawai'i Cancer Center's food composition database, which contains local foods and recipes not found in the USDA standard reference.[9] Food group data were compared to Food Guide Pyramid reference values that were used at the time of analysis.[10] To determine if there were ethnic differences in the average dietary intakes, first the overall ethnic effect on any of the food groupings (or the nutrients, or the HEI scores) was simultaneously tested using multivariate analysis of variance (MANOVA). Statistical analyses were conducted using SAS PROC GLM. For both children and caregivers, three independent MANOVAs were performed for food groups, nutrients, and HEI scores. If the results of MANOVA indicated that there was a significant overall ethnic effect, then individual ANOVA were performed to test if the individual elements of the food/nutrient/HEI score was influenced by ethnic group. Multiple comparisons were adjusted for at $p<0.05$ using the methods of Benjamini and Hochberg.[11] Following the individual ANOVA tests, pairwise comparisons (Tukey's honest significance test) were performed on those that showed significant ethnic effect to determine magnitude of effect. All models were adjusted for the potential confounders of age, sex, and "food season." To adjust for expected "seasonal" (holiday) variation in dietary intake, "food season" variables were created and defined as follows:

1. Halloween (yes, if measured between October 31, 2005 and November 10, 2005; or no for any other date)
2. Winter holiday (yes, if measured between November 20, 2005 and January 7, 2006; or no for any other date)
3. Summer vacation (yes, if measured during June, July, or August in 2006; Or no for any other date)
4. School year (yes, if measured between January 8 and January 31, February, March, April, May, September October, and between November 11 and November 19 in 2005 or 2006).

Results

Table 1 summarizes the demographic characteristics of children and caregivers in the analysis. On average, children were 10 years old, ranging from 6 to 13 years old. The average age of caregivers was 40, ranging from 15 to 78 years old. Seventy percent of caregiver respondents were Native Hawaiian and 96% were females. Forty percent of caregiver respondents were unemployed and 30% worked full time (40 hrs/wk or more). The average number of years of education among caregivers was 12.5 years and ranged from 0 to 18 years. The calculated average score of material style of life was 4.7 on a scale of 1 to 7. No significant differences were found by community of residence, material style of living, or caregiver education among the three ethnic groups, indicating that this subset of population consisting Hawaiians, Filipinos, and Whites have similar socio-economic status.

Mean nutrient intakes were described for children and for caregivers in Table 2 and were adjusted for the potential confounders of age, sex, and "food season." Recommended intakes for comparison are for 9–13 and 31–50 year olds, based on the recommended dietary allowances or adequate intakes from US Department of Agriculture,[12] except for sodium, which is the

Table 1. Demographic characteristics of children (N=156) and caregivers[a] (N=156) in the study.

	Mean ± SD	Range
Age		
Child age, yrs	9.96 ± 1.18	6.7-13
Caregiver age, yrs	40.18 ± 11.02	15-78
Education		
Caregiver education, yrs	12.53 ± 2.37	0-18
Material style of life score[b] (1-7)	4.68 ± 1.08	1-7
Ethnicity - Caregiver Ethnic Group		
Native Hawaiian	70%	
Filipino	18%	
White	12%	
Sex		
Child sex, females	47%	
Caregiver sex, females	96%	
Employment		
Unemployed	40%	
Seasonally/Occasionally employed	8%	
Employed less than 30 hrs/wk	7%	
Employed for 30-40 hrs/wk	15%	
Employed for more than 40 hrs/wk	30%	
Food Season[c]		
Halloween (Oct. 31st – Nov. 10th)	3%	
Holiday (Nov. 20th – Jan. 7th)	14%	
No school (Jun., Jul., & Aug.)	11%	
School[c]	72%	

[a]Mother=111; Father=6; Foster parent=2; Foster grandparent=1; Grandmother=20; Aunt=2; Sibling=1; Babysitter=1 and Missing=12.
[b]Ownership of various items (TV, car, microwave, etc…)
[c]Food season in 2005-2006.School includes: January 8th to January 31st, February, March, April, May, September, October 1st to October 29th and November 11th to November 19th.

tolerable upper intake level. Percent of calories from protein, fat, and carbohydrate are acceptable macronutrient distribution ranges. Recommended energy level is based on women 25 – 50 years in Basiotis, et al.[13] Recommendations for cholesterol and percent of calories from saturated fat are from the 2010 Dietary Guidelines.[14] Seventy-two percent of respondents reported that the recorded intake was typical or "usual."

The fiber content of both child and caregiver diets was particularly low (approximately half of the recommended levels), and sodium intakes were particularly high (especially among caregivers). Intakes of three food groups were low for children: fruits (1.78 ± .18 vs 2.7 recommended servings/d), vegetables (2.11 ± .16 vs 3.7 servings/d), and whole grains (.95 ± .11 whole grain servings/d vs 3 servings/day). Conversely added sugar intake was high (23.7 ± 1.2 vs < 10 teaspoons/d). Among caregivers, total grain intake (5.97 ± .28 vs 9 servings/d), vegetable intake (2.83 ± .19 vs 4 servings/d), fruit intake (1.8 ± .23 vs 3 servings/d), and dairy intake (.8 ± .09 vs 3 servings/d) were low.

The analysis results of MANOVA for children show that there was no significant overall ethnic effect on any food group, nutrients, or HEI scores. For caregivers, on the other hand, the overall effect of ethnic group on nutrients and HEI scores was significant at the $P < .05$ level, but not on food groups; in other words, the average consumption of nutrients and HEI scores were statistically different among the three ethnic groups. The values of Wilks' lambda and the associated *P*-value (in parentheses) were .59 (.071), 1.65 (.005), and 1.91 (.015) for food groups, nutrients and HEI scores, respectively. The summary statistics and test results of individual ANOVA and pairwise comparisons are presented in Table 2 for nutrients and in Figure 1 for HEI scores. Both children's and caregivers' data are presented.

For caregivers, the results of pairwise comparisons among the three ethnic groups indicate that the mean intakes of calcium among Native Hawaiians and Whites are statistically different at the $P < .05$ level, the mean intakes of vitamin C for Hawaiians and Filipinos are both statistically different from the mean intake of vitamin C for Whites, and the dairy HEI scores for Hawaiians and Filipinos are both statistically different from Whites at *P*-value < .05 level. White values were always higher.

Furthermore, to investigate if the differences between the mean intakes of calcium and vitamin C, and the dairy HEI scores for the three ethnic groups were due to total dairy consumption and not because of different ethnic group, total dairy consumption was included as one of the covariates in the model for caregivers. Indeed, the ethnic difference in calcium consumption and dairy HEI score was due to differences in total dairy consumption, but ethnic differences in vitamin C intake persisted (White values were higher).

Discussion

Caregiver's food intake varied by ethnicity but mixed ethnicity and lack of specificity of child's ethnic group may explain the lack of differences in dietary intakes between children of different ethnic groups. On the other hand, the finding may reflect a true lack of ethnic difference among children, a plausible occurrence due to Westernization or acculturation of dietary habits.[15] Increased intake of dairy foods would improve dietary quality of the population and may be valuable in weight management.[16] While the prevalence of lactose maldigestion is not known in this population, there are known strategies for consuming milk (such as consuming milk in small portions, or consuming live-culture yoghurt) that improve lactose tolerance and could be promoted, along with information about the substantial health promoting nutrients in dairy foods.[17,18] Certainly culturally-favored food approaches to obtaining these nutrients should be prioritized. Increasing intake of fresh fish, root vegetables and fresh fruit (and decreasing canned meat) would be a good approach to improve dietary quality with foods familiar to the Pacific region. Measures of socioeconomic status and caregiver education did not explain differences in food and nutrient intake of children or caregivers, though our study sample is somewhat small and homogenous; still, no effect of socioeconomic status

Table 2. Children and caregivers' nutrient intake (mean ± SE) by ethnic group and compared to recommended nutrient intakes for individuals. Means for "Total" are arithmetic means; Means for "Native Hawaiian," "Filipino," and "White" are least-squares means computed for each ethnic group after adjusting for age, sex, and food season.

	Child (n=156)					Caregiver (n=156)				
Nutrient Intake	**Recommended Intake[1]**	**Total (N=156)**	**Native Hawaiian (n=110)**	**Filipino (n=28)**	**White (n=18)**	**Recommended Intake**	**Total (N=156)**	**Native Hawaiian (n=110)**	**Filipino (n=28)**	**White (n=18)**
Energy, kcal	2000	2195 ± 63	2213 ± 75	2137± 152	2175 ± 188	2200	1956 ± 79	1960 ± 93	1763 ± 185	2232 ± 231
Protein, g	0.76[a]	75 ± 3	76 ± 3	71 ± 6	73 ± 8	0.66[a]	76 ± 3	77 ± 4	71 ± 8	76 ± 10
Total Fat, g	ND	80 ± 3	81 ± 3	75± 7	77± 8	ND	76 ± 4	78 ± 4	63 ± 8	82 ± 10
Cholesterol, mg	<300[c]	273 ± 15	285 ± 19	248± 38	244 ± 47	<300[c]	320 ± 21	327 ± 25	265 ± 49	363 ± 62
Carbohydrate, g	100	300 ± 10	300± 12	298 ± 24	304 ± 30	100	245 ± 11	240 ± 13	232 ± 25	294 ± 31
Total Fiber, g	28[b]	13 ± 1	13 ± 1	12 ± 2	15 ± 2	28[b]	12 ± 1	12 ± 1	12 ± 1	16 ± 2
Calcium, mg	1100	858 ± 46	818 ± 52	831 ± 106	1141 ±131	800	592 ± 39	576 ± 45*	416 ± 89**	964 ± 111
Phosphorus, mg	1055	1177 ± 40	1180 ± 45	1093 ± 92	1285 ± 114	580	1029 ± 45	1033 ± 53	871 ± 106	1253 ± 133
Iron, mg	5.7-5.9	13 ± 1	14 ± 1	12 ± 2	15± 2	6-8.1	12 ± 1	12 ± 1	12 ± 2	13 ± 2
Sodium, mg	1500	3326 ± 139	3367 ± 162	3294 ± 331	3125 ± 409	1500	3200 ± 174	3272 ± 210	2814 ± 417	3365 ± 521
Potassium, mg	4.5	2242 ± 87	2188 ± 103	2179 ± 211	2667 ± 261	4.7	2190 ± 103	2142 ± 120	1916 ± 238	2914 ± 298
Vitamin A RAEs, mcg	420-445	807 ± 55	796 ± 66	712 ± 135	1022 ± 167	500-625	706 ± 52	683 ± 63	634 ± 124	954 ± 156
Riboflavin, mg	0.8	2 ± 0.1	2 ± 0.1	2 ± 0.2	3 ± 0.3	0.9-1.1	2 ± 0.1	2 ± 0.1	1.4 ± 0.2	2 ± 0.3
Folate DFE, mcg	250	453 ± 27	441 ± 32	397 ± 64	610 ± 79	320	384 ± 21	382 ± 25	293 ± 50	536 ± 62
Vitamin C, mg	39	118 ± 12	120 ± 15	93 ± 30	143 ± 37	60-75	130 ± 12	121 ± 14*	93 ± 28**	248 ± 35
Vitamin D, mcg	10	195 ± 14	182 ± 16	200 ± 32	266 ± 40	10	111 ± 12	118 ± 15	82 ± 30	111 ± 37
% calories from protein	10-30[c]	14 ± 0.3	14 ± 0.4	14 ± 0.7	13 ± 1	10-35[c]	16 ± 0.4	14 ± - 0.4	13 ± - 1	14 ± - 1
% calories from fat	25-35[c]	33 ± 1	33± 1	33 ± 2	31 ± 2	20-35[c]	35 ± 1	33 ± - 1	32. ± - 2	31 ± - 2
% calories from saturated fat	<10[c]	11 ± 0.3	11 ± 0.3	11 ± 1	11 ± 1	<10[c]	11 ± 0.3	11 ± - 0.3	10.8 1	11.2 ± - 1
% calories from carbohydrate	45-65[c]	54 ± 1	54 ± 1	54 ± 2	57 ± 2	45-65[c]	50± 1	54 ± -1	55 ± - 2	56 ± - 2

P-values for all pairwise comparisons among the three ethnic groups are adjusted by Tukey's method.

[1]Recommended intakes are for 9-13 and 31-50 y, based on the Estimated Average Requirements (EAR), Recommended Dietary Allowances (RDAs, eg, for sodium) or Adequate Intakes (AIs, eg, potassium) (14), percent of calories from protein, fat, and carbohydrates are Acceptable Macronutrient Distribution Ranges (AMDRs). Recommendations for cholesterol and % of calories from saturated fat are from the 2010 Dietary Guidelines (12).

[a]Estimated Average Requirement for protein is 0.76 per kilogram of body weight per day for girls and boys 9-13y, and is 0.66 per kilogram of body weight per day for adults 31-50y.

[b]14g/1000 kcal

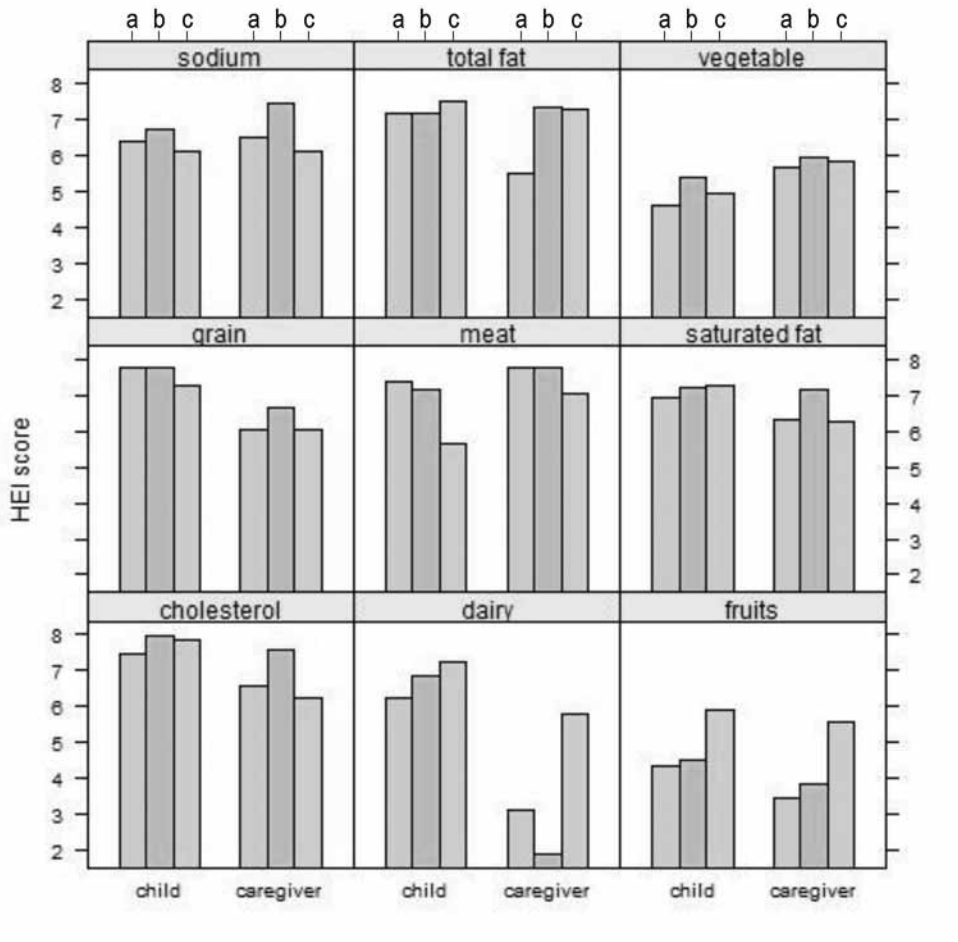
[c]Acceptable Macronutrients Distribution Ranges for Energy, Carbohydrates, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (2002/2005).

*Native Hawaiian significantly different from White (*P*=<0.05).

**Filipino significantly different from White (*P*=<0.05).

was found in larger studies with other Pacific ethnic groups.[4] Although questionnaires and recalls were interviewer administered, dietary intake was self-reported with the potential for over and underreporting,[19] especially among children whose cognitive processing of dietary information is likely limited.[20] On the other hand, underreporting is less common in younger children than among older adolescents. This study employed trained interviewers who were familiar with local foods and customs, and used an established multiple pass method[6] to improve accuracy.

The local foods and recipes that are carried on the Cancer Center of Hawai'i's food composition database allowed for more accurate dietary nutrient estimates than if US Department of Agriculture[14] alone had been used. We did not assess ethnic differences in the prevalence of nutrient inadequacy (ie, the prevalence of usual nutrient intakes below the Estimated Average Requirement) because the relatively small samples of Filipino and White children and caregivers precluded estimation of a usual intake distribution. However, Martin, et al, have reported the prevalence of nutrient inadequacy for the total sample of children in this study, and found inadequacy of intakes of vitamins A, C, and E as well as of phosphorus and magnesium to be of particular concern, which was partially ameliorated with dietary supplement use in the communities.[8]



Legend: **a** = Native Hawaiian, **b** = Filipino, and **c** = White

Figure 1: Child and caregiver Healthy Eating Index (HEI) individual component scores (range 1-9). Note that for sodium, total fat, and cholesterol, higher HEI scores mean lower intakes. Models are adjusted for age, sex, and food season; PROC GLM procedure. The dairy HEI scores for Native Hawaiians and Filipinos are both statistically different from White at $P<0.05$ level for caregivers.

Overall, intakes of fruits, vegetables, and whole grains were lower than those recommended for children, while added sugar intakes were high. However, intakes of food groups and nutrients did not differ by ethnic group. Caregivers' intakes of several food groups were low. White caregivers had higher food group intakes (especially dairy) and had more nutrient-rich diets (especially Vitamin C) compared to Filipino or Native Hawaiian caregivers of the same socio economic status. Dietary intakes of children and caregivers varied by food season, which may provide a target for future intervention. Increasing dairy, vegetable, and fruit intake would substantially improve dietary quality of both children and caregivers in this population.

Confict of Interest

The authors report no conflict of interest.

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Early Educational Opportunities at the John A. Burns School of Medicine: The MD 5 Curricular Unit

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Introduction

There are many advantages in providing educational opportunities beyond the standard curriculum for medical students. Participation in electives may assist student career choice.[1] Experiences in the humanities may help maintain empathy, improve cultural competence and communication, and increase clinical observation and listening skills.[2] Research training may help reverse the decline in physician-scientists by promoting clinical research and academic careers.[3] International exposures encourage the choice of careers in primary care, improve cultural competence, and increase student participation in volunteerism, humanitarian efforts and working with underserved populations.[4] Moreover, participation in international medical opportunities can provide clinical experiences in recognizing and treating diseases uncommon in the United States, but essential in treating immigrants or those returning from travels abroad,[4] a skill that would be applicable in Hawai'i.

In 2008, the curriculum at JABSOM was restructured to encourage students to participate in and benefit from different educational experiences, while providing faculty the opportunity to offer courses in their field of practice and personal interest.

MD 5 Curricular Unit

From the institutionalization of the PBL curricula at JABSOM in 1989 to 2008, all medical students had two requirements in the summer between their first and second years. The first was to complete a student research project in a subject of their choice, and the second was a clinical preceptorship with a primary care physician. The preceptorship and student research project were required to be under the guidance of JABSOM-affiliated faculty. In 2008, the curriculum was restructured so that this period was replaced with MD 5, composed of two 4-week curricular blocks with variable contact hours per week. Students are required to register for one of many selectives offered during one of the two blocks, but may register for two courses in each block.

MD 5 Goals

The goals of the MD 5 curricular unit are to provide students with the ability to select a course that would best meet their academic needs and personal interests, whether it is to review or learn additional biological sciences, to practice clinical skills under various preceptors in different fields, to explore possible career options, or to participate in research. An added goal is to provide opportunities for students to experience health care on the neighbor islands, the US mainland, and internationally. Under the MD 5 curriculum, students can accept research or clinical fellowships outside of Hawai'i for MD 5 credit. MD 5 was designed to be less rigorous than the other courses in the first and second year, to provide time to pursue non-academic interests and promote "student well-being," a JABSOM Graduation Objective[5]. The flexible schedule allows students to choose variable amounts of vacation, explore other interests and experiences, and participate in recreational activities.

MD 5 Courses

All MD 5 courses are aligned with the JABSOM Graduation Objectives[5] and created with the JABSOM Educational Philosophy[6] in mind. The requirements vary and are dependent on the type of experience selected. Students in medical education and biological science selectives are expected to devote 5-10 hours per week. Clinical preceptorships are required to meet no more than four half-days per week. Students in research selectives are encouraged to immerse themselves in their experience and may invest more than the minimum four half-days per week. In addition to courses developed by faculty, students can design their own selective course under the guidance of a faculty supervisor, such as medical education projects or research topics. Active learning methods that focus the responsibility of learning on the learners are encouraged in the selectives.

The MD 5 courses offered in 2012 were:

Medical Education
- Enhancing Clinical Skills Through Art
- MD 1 Coaching
- Cardiovascular Case Maps
- Pulmonary Case Maps

Basic Science
- Highlights of Organ System Biochemistry
- Introduction to Pathology and Laboratory Medicine
- Review of Infection and Immunity and Immunodeficiency Diseases
- Selected Topics in Infectious Diseases

Clinical Experiences
- Clinical Preceptorships (including Internal Medicine, Cardiology, Genetics, Ob/Gyn, Oncology, Ortho Surgery)
- Clinical Preceptorships in Native Hawaiian Health

Research
- Directed Research in Dermatology
- Research in Embryology
- Research in Pediatrics
- Selected Research Topics in Infectious Diseases
- Independent Research

International (Pacific Basin) Experiences
- US Affiliated Pacific Islands
- Japan
- Philippines

The following are descriptions of some MD 5 offerings:

Enhancing Clinical Skills Through Art: The goal was to enhance clinical skills by strengthening observation, interpretation, communication, and emotional competence at the Honolulu Academy of Arts. Each session included interactive discussions around a selection of art from ancient to contemporary and clinical connection. The objectives were to: (1) develop fast complete observation and clear communication skills while observing people portrayed in paintings as patients; (2) recognize that the different possible interpretations of the same factual inferences of portrait patients, and that the attitudes and biases of others, and their own, can impact the diagnosis and treatment of patients; and (3) understand the importance of complete observations and inferences, especially in handling problems and ambiguous situations with patients.

MD 1 Coaching: The goal was for second year students to coach incoming first year students in developing their self-directed learning skills. The objectives were to mentor beginning students in: (1) identifying and selecting resources to complete learning issues, (2) synthesizing information into a handout and presenting information to their peers, and (3) mapping concepts and developing study skills for exams.

Clinical Preceptorships in Native Hawaiian Health: The goal was for students to have a focused experience in clinical medicine with opportunities to practice history and physical examination in Lau Ola, the medical clinic in the Department of Native Hawaiian Health, or in a community health center. The objectives were to: (1) perform a complete or organ-specific history and physical exam following an appropriate exam sequence and utilizing correct technique in a manner that reflects a clear understanding of the manifestations of common maladies; (2) respect issues of modesty and personal space when interviewing a patient or performing a physical exam; (3) interpret accurately patient responses, physical findings, and diagnostic test results, adjusting appropriately the likelihood of each illness in the differential diagnosis; and (4) develop and implement an appropriate therapeutic plan that takes into account, efficacy, adverse effects, cost, and compliance issues, in the context of the patient's overall goals, values, and cultural beliefs for conditions found in the Native Hawaiian populations, both acute and chronic.

Research in Pediatrics: The goal was to provide students an opportunity to serve as a clinical research assistant in a project conducted at the Kapiolani Medical Center for Women and Children. The objectives were to learn and demonstrate: (1) effective interviewing skills with smokers interested in quitting smoking, (2) accurate data collection and data entry skills using information gathered through face-to-face and telephone interviews with smokers, and (3) basic understanding of research design and methodology.

US Affiliated Pacific Islands: The goal was for students to observe clinical and community care on remote Pacific islands. The objectives were to: (1) experience health care in a extreme rural area, (2) understand culture aspects of the US Affiliated Pacific Islands, and (3) help islanders understand their health issues. In the summer of 2012, twelve second-year medical students experienced the medical care systems of five of the six US Affiliated Pacific Islands. All students rotated through the Federated States of Micronesia (Yap, Chuuk, Pohnpei, and Kosrae), the Republic of the Marshall Islands, the Commonwealth of the Northern Mariana Islands, Guam, and American Samoa. Experiences included clinical shadowing in clinics and hospitals, public health and disease prevention research, and cultural immersion. Funding was provided by the Hawai'i/Pacific and Guam Area Health Education Center programs, in collaboration with the Department of Veterans Affairs. (See reference #7 for a student's reflection on her experience in 2010.)

Japan: The goal was for students to explore the common health concerns and cultural issues affecting health and the health care system of Japan. The objectives were to: (1) expose students to the healthcare systems of Japan, (2) increase students' knowledge of common illnesses of the region, and (3) expose students to cultural issues affecting health. Eleven second-year medical students were assigned in groups to the affiliated Schools of Medicine in Keio, Kochi, or Osaka. Students interacted with Japanese medical faculty and students in a variety of clinics, hospitals, and communities to examine differences and similarities of patient care between Japan and the United States. Due to the separate locations in Japan, each group had its own unique experience. Experiences included patient home visits to extremely rural communities, pairing with a Japanese medical student to learn about medical student life in Japan and Japanese culture, an overnight stay in a rural town to learn about rural medicine and Japanese culture, shadowing various medical specialties, and attending lectures on medical curriculum and university research. These experiences were subsidized partially by JABSOM's Office of Medical Education.

Philippines: The goal of this course was to provide students the opportunity to explore health issues of people living in a developing country and to foster a deeper understanding of practicing medicine in a culturally sensitive manner. The objectives were to: (1) appreciate the social, cultural, and economic barriers in Global Health by visiting a foreign country; (2) respect issues of patient modesty and personal space in a culturally appropriate manner; and (3) learn about common health issues of the region. Two second-year medical students participated in a 2-day medical mission that served over 1,000 patients. The students shadowed local, international, and JABSOM health

professionals. They also shadowed various medical specialties at a private hospital in Batangas, Manila and visited the University of Santo Tomas. Their experience included a severe monsoon that made travel around Manila almost impossible. This selective was sponsored and funded partially by the Philippine Medical Association of Hawai'i (PMAH) to promote a better understanding of distinct and common health problems of Filipinos living in the Philippines and Hawai'i.

MD 5 Evaluations

Student feedback on MD 5 experiences has been favorable as reflected in the MD 5 2011 Survey Results (Table 1).

Student comments on MD 5 included the following:

> "Being able to choose our MD 5 elective was wonderful – I was able to participate in something that I found interest in and benefit in."
>
> "It provided us with experiences (medical) that could not be read out of a textbook or experienced during lecture."
>
> "I was able to have an experience in rural health that greatly enhanced my medical education, but I could not have obtained back on O'ahu. I believe that the experience will help me to be a better doctor in the future."

Loss of Required Research: Its Impact on Students

Two requirements were eliminated due to the incorporation of MD 5. The first was a clinical preceptorship. As students have mandatory clinical skills courses and preceptorships during each curricular unit in the preclerkship years, the anticipated impact was minimal. The second was a student research project. As students had no student research experience required in the remainder of the curriculum, the loss of this facet of the curriculum became a concern. It was acknowledged that not all students would choose to do research, but hypothesized that the revised curriculum would allow for more research productivity for both students and faculty. Students who were most interested in research would be able to approach a faculty member without competing with 65 classmates in need of a required research project. The faculty, in turn, know that the students they accept into their project are truly interested in contributing to the effort of the research team. Students are also able to accept research opportunities in other institutions. In the first year of MD 5, five medical students were involved in research at Case-Western Reserve University, Fred Hutchinson Cancer Research Center, Medical University of South Carolina at St. Jude, and the University of Medicine and Dentistry of New Jersey.

Table 1. Selected Results from the MD 5 2011 Survey

	Statement	Number of Respondents and (Percent)			
		Strongly Agree	Agree	Disagree	Strongly Disagree
1	My MD 5 academic requirements left time for me to explore other interests, experiences, and recreational activities during the summer.	37 (76%)	10 (20%)	1 (2%)	1 (2%)
2	I valued the opportunity to choose my MD 5 courses.	47 (96%)	2 (4%)	–	–
3	The length and level of intensity of the MD 5 block…supports student well-being at JABSOM.	44 (90%)	3 (6%)	1 (2%)	1 (2%)
4	MD 5 was an effective learning experience.	46 (94%)	2 (4%)	–	1 (2%)

Table 2: Increased Research Productivity as Measured by Conference Presentations

	Last Class with Required Research	First Class with MD 5 Selectives
Response Rate	56/59 = 94.9%	45/56 = 80.4%
Percentage of respondents who participated in research	56/56 = 100%	31/45 = 68.9%
Percentage of research participants who had presentations	33/56 = 58.9%	22/31 = 71.0%
Number of presented projects / Number of research participants	35/33 = 1.06	29/22 = 1.32
Number of presentations / Number of projects	51/35 = 1.46	41/29 = 1.41
Highest level of venue presentation per project		
JABSOM/UH	3/35 = 8.6%	2/29 = 6.9%
Local	4/35 = 11.4%	2/29 = 6.9%
Regional	1/35 = 2.9%	2/29 = 6.9%
National	20/35 = 57.1%	15/29 = 51.7%
International	7/35 = 20.0%	8/29 = 27.6%

Table 3: Increased Research Productivity as Measured by Publications		
	Last Class with Required Research	**First Class with MD 5 Selectives**
Percentage of respondents who had publications	17/56 = 30.4%	11/31 = 35.5%
Number of publications / Number of research participants	18/17 = 1.06	16/11 = 1.45
Number of publications in non-local journals	8/18 = 44.4%	14/16 = 87.5%
Number of publications in Journal Citation Index	7/18 = 38.9%	12/16 = 75%
Mean Impact Factor	2.74	3.67
Standard Deviation	2.58	2.00
Number of citations in Web of Science	7/18 = 38.9%	9/16 = 56.2%
Mean number of citations	0.57	1.71
Standard Deviation	0.79	2.14

The Office of Medical Education surveys medical student research productivity in each graduating class. This allowed for the comparison of research productivity from the last class with a required research project, and the first class with MD 5 selectives. The former had a survey response rate of 94.9% and 100% participated in research, while the latter had a survey response rate of 80.4% and 68.9% of respondents participated in research. However, there was an increase in the number of presented projects per research participant, and a slightly greater proportion of presentations at the regional, national, and international levels compared to the in-school and local levels (Table 2).

There was an increase in the number of publications per research participant, a near-doubling of publications in non-local journals, publication in journals with a higher mean impact factor as noted on the Journal Citation Index, increased number of publications that were cited by other publications as noted in Web of Science, and an increased number of citations per publication (Table 3).

Conclusion

MD 5 is a new curricular unit that provides second-year students an opportunity to choose an educational experience that meets their need or interest. Students may explore basic science courses, clinical preceptorships that allow for career exploration, research experiences and fellowships, international rotations, and innovative courses in the humanities and student mentoring. It is less rigorous by design, providing the students with some respite between organ system-based units with high academic demands. In addition, this forum provides an "educational sandbox" for faculty who wish to experiment with different content or educational methods. Extremely well-received by students, MD 5 has added a richness to the educational experience while simultaneously increasing the quality of student research.

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PUBLIC HEALTH HOTLINE
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Pelvic Inflammatory Disease as a Public Health Problem

Misty Pacheco DrPH, MHA

Pelvic inflammatory disease (PID) is a complication that may result from some sexually transmitted diseases (STDs), most commonly the bacterial STDs Chlamydia and Gonorrhea. The causal bacteria can move from the cervix to the fallopian tubes, causing damage to the tissues of the woman's reproductive organs.[1] Serious consequences, such as chronic pelvic pain, ectopic pregnancy, and infertility can occur. Prompt detection and treatment of PID is important to prevent further damage. However, it is difficult to achieve early detection because symptoms of PID are often mild, vague, or unrecognized.[1] Although PID can be treated with antibiotics, any damage that has already occurred is not reversible. There are two surveillance case definitions for PID provided by the Centers For Disease Control and Prevention (CDC):

> "The first defines a woman as meeting the CDC case definition if she presents with lower abdominal pain and had not been diagnosed as having an established cause other than PID (eg, ectopic pregnancy, acute appendicitis, or functional pain), and if she had all 3 of the following clinical criteria: (1) lower abdominal tenderness, (2) cervical motion tenderness, and (3) adnexal tenderness. The second states that any woman given a diagnosis of PID by a clinician should be counted as a case of PID"[2(p328)]

The CDC estimates that about 75,000 women in the United States experience an acute episode of PID annually, and 10 - 15% of cases result in infertility.[3] The direct medical cost for a single case of PID is estimated to be $2,305.[4] Although PID is a serious infectious disorder, it is not nationally notifiable, and it is deemed a "notifiable disease" in only 19 states (Hawai'i is one of them), as well as the District of Columbia and Puerto Rico.[5]

PID and Disease Surveillance Systems

The systematic collection, analysis, and interpretation of health data are referred to as surveillance. Data from surveillance are disseminated to entities to plan and evaluate programs, develop policy, and appropriately allocate resources.[1] More specifically, a surveillance system is important to describe trends and define the natural history of a disease, detect epidemics, reveal disease occurrence-pattern details, track changes in health practices, and evaluate control and prevention measures.

Legislation and regulation of disease reporting are done at the state level, and the list of notifiable diseases varies by state. Even in states where reporting is required, PID surveillance usually is passive, which puts responsibility of reporting PID on the diagnosing physician. Factors related to diagnosing PID, such as the lack of a clinical diagnostic gold standard, variability of clinical judgment of symptoms, underreporting, and a diagnostic shift from inpatient to outpatient, all contribute to the challenge of maintaining an effective PID surveillance system.[6]

PID Reporting in Hawai'i

PID is a state-mandated notifiable disease in Hawai'i under Hawai'i Administrative Rule, Title 11, Department of Health, Chapter 156, Communicable Diseases, the Hawai'i Department of Health (HDOH). According to Hawai'i State law, once a physician diagnoses a female with PID, he/she has three business days to complete the case report form and submit it to the HDOH via phone, mail, or fax. The reporting form is available online at the HDOH website or can be ordered (at no charge) by fax. Once the form is received, HDOH performs any follow-up that is needed, such as partner management, adds date of treatment given, and the information from the form is entered into a database.

HDOH analyzed their PID surveillance data and found that from 2007-2009, 189 cases of PID statewide were reported to HDOH. For those same calendar years, a Hawai'i insurance company extracted PID claims data from their MedQuest (Medicaid) insurance plan for females 14 and older. They used the first three digits of the PID International Classification of Diseases – 9th revision – Clinical Modification (ICD-9) associated with the primary diagnosis of PID (614 and 615), and found 677 cases.

Data on PID hospitalizations from 2006-2010 was extracted from the Hawai'i Health Information Corporation (HHIC) database (based on ICD-9 codes to identify PID). PID hospitalization rates were calculated and compared to data from the HDOH PID surveillance data for the same time period (Hawai'i Health Information Corporation, 2012). From 2006 – 2010, a total of 335 unique cases of PID were reported through the state surveillance system. During the same period 794 unique cases of PID were diagnosed in Hawai'i hospitals. Among hospitalized cases, the highest rates of PID were in among women aged 20-24 years; the lowest rates were in women ≥45 years and 15-19 years *(M. Pacheco, A. Katz, T. Sentell, unpublished data, October 2012)*. This analysis confirmed that PID is severely under-reported in the state of Hawai'i.

Status of Interventions

A literature review using PubMed was conducted to examine if any of the United States locales with PID reporting statutes have conducted studies to assess their mandatory PID reporting

system. Searches used key words such as "state AND report* AND pelvic inflammatory disease," "United States AND PID AND surveillance" and "pelvic inflammatory disease" AND report*. In addition, the names of each of the 19 states, District of Columbia, and Puerto Rico were entered in place of "state" in the query "state AND report* AND pelvic inflammatory disease". A total of 31 articles were flagged for review, but only three were relevant. The other 28 articles were excluded because they did not look at PID reporting and instead discussed PID diagnoses specifically or focused on predictors and risk factors for PID.

The three studies relevant for review were from California, Massachusetts and Oregon, all of which mandate PID reporting. The California study,[7] which surveyed primary care physicians, revealed that physicians were more likely to report PID if they were in the public sector, and if their patients were non-White and Medicaid recipients. The findings suggested that reporting was low because some physicians were unaware that PID is reportable in California or they relied on others to report it.

A goal of the Massachusetts study was to inquire if the diagnostic code 614.9 assigned to electronic medical records (EMRs) for PID within a large multi-specialty group practice affiliated with a managed care organization was used and, if so, whether the patient met the CDC PID case definition.[6] Ultimately, the authors found that only 39 of the 216 patients with a 614.9 code (18.1%) met the CDC symptom-based criteria for a PID case.

The third study,[2] from Oregon, used administrative data to enhance PID surveillance by exploring which written physician diagnoses from the emergency department (ED) were compatible with the CDC PID case definition. They found that three written diagnoses (PID, pelvic inflammatory disease, salpingitis) met the CDC PID case definition. Within their information system, they found 157 charts of women whose diagnoses could be compatible with that of PID. Of the 157 diagnoses, 45 had been identified by their system as a PID diagnosis and met the CDC PID surveillance case definition by including any of these three diagnoses. Only three of the 45 cases had been reported, suggesting underreporting.

Dissertation Studies

The issue of under and/or non-reporting of PID in Hawai'i became the focus of a doctor of public health dissertation. The purpose of the three studies of the dissertation was to investigate PID reporting in Hawai'i so that the necessary strategies for PID surveillance improvement can be identified and executed. The first of three studies surveyed physicians licensed in Hawai'i and utilized hierarchical logistic regression to assess PID knowledge, and attitudes and barriers to diagnosing and reporting PID. Study 2 assessed the concordance between physician self-disclosed PID reporting data from a survey and actual PID reports from the HDOH PID surveillance system using Cohen's kappa. The final study aimed to answer, "How do health administrators view the mandated disease reporting system (with a focus on PID reporting)?" In this qualitative study, key administrative stakeholders were interviewed. The findings from these three studies confirm that: (1) awareness of PID reporting is low among physicians and healthcare administrators; (2) discordance exists between self-reported PID data and HDOH PID surveillance data; and (3) education about PID and the mandated disease reporting law and process is needed. Future studies to determine the incidence and prevalence of PID in Hawai'i need to be conducted so the status and level of severity of the disease can be determined. When that information is gathered, it can be made available to the public and be used to design and implement interventions to improve PID reporting.

For information on PID, as well as the complete CDC case definition for PID, providers can go to: http://www.cdc.gov/ncphi/disss/nndss/casedef/pelviccurrent.htm and http://www.cdc.gov/std/pid/stdfact-pid.htm. Information on PID and other STD disease reporting in the State of Hawai'i can be found at: http://hawaii.gov/health/healthy-lifestyles/std-aids/disease-reporting/index.html.

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UPCOMING CME EVENTS

Interested in having your upcoming CME Conference listed? Please contact Brenda Wong at (808) 536-7702 x103 for information.

Date	Sponsor	Location	Meeting Topic	Contact
January 2013				
1/6-1/11	UC San Francisco School of Medicine	Fairmont Orchid, Kohala, Big Island	A Practical Approach to Breast Imaging	www.cme.ucsf.edu/cme
1/13-1/16	Vindico Medical Education, Orthopedics Today, Int'l Congress for Joint Reconstruction	Fairmont Orchid, Kohala, Big Island	Orthopedics Today Hawai'i 2013	www.othawaii.com
1/13-1/18	UC San Francisco School of Medicine	Fairmont Orchid, Kohala, Big Island	Practical Body Imaging in Paradise	www.cme.ucsf.edu/cme
1/20-1/24	UC Davis Health System	Sheraton Maui	D. Eugene Strandness Jr. Symposium: Diagnostic & Therapeutic Approaches to Vascular Disease	www.strandness-symposium.com
1/20-1/24	Mayo Clinic	Maui	Tutorials in Diagnostic Radiology	www.mayo.edu/cme
1/28-2/1	Mayo Clinic	Fairmont Kea Lani, Maui	Arrhythmias & the Heart: A Cardiology Update	www.mayo.edu/cme
February 2013				
2/2-2/8	UC San Francisco School of Medicine	Grand Hyatt Regency, Koloa, Kauai'i	20th UCSF International Symposium in Oral & Maxillofacial Surgery	www.cme.ucsf.edu/cme

THE WEATHERVANE
RUSSELL T. STODD MD; CONTRIBUTING EDITOR

Russell T. Stodd MD

THE OBSCURE WE SEE EVENTUALLY. THE OBVIOUS TAKES LONGER.

Without doubt, removal of a cataract improves vision and should improve driving performance as well. A study of 27,827 patients in Australia found that 1,715 were involved in motor vehicle accidents in the 12 months before or after surgery. Men were drivers in 1,124 of the crashes, of which 611 occurred before the operation and 513 in the 12 months following, a decrease of 15.3%. Females were driving when 638 accidents happened, 330 before and 308 after cataract removal, virtually no change in frequency. Without knowing additional details, one might assume that men are more likely to continue to drive with impaired vision before seeking help. Women are less likely to push the envelope and get help sooner. Also, they are more likely to ask for directions in finding the surgeon's office.

BEST LAID PLANS OF MICE AND MEN... IN THIS CASE, CHOOSE THE RODENT.

Researchers at Hunter College at City University of New York have developed a genetically modified mouse to sniff out explosives. It is 500 times more sensitive than its normal counterpart. Scientists hope to produce a "hero mouse" that could warn of buried bombs. Meanwhile, a Belgian organization called APOPO already uses a giant African pouched rat to smell out land mines. The rodent can detect TNT and other explosive compounds. It is trained to scratch the surface over a land mine (it is too small to produce detonation) and two handlers can remove the device safely. The trio can cover a field in one hour that would take two men with metal detectors two full days.

HE WHO DRINKS TOILET WATER HAVE POTTY MOUTH... NOT!

About 60% of the continental United States is living through drought conditions. Many counties from coast to coast have been declared disaster areas, and have been placed on restricted consumption. It is past time to recognize that our waste water can be safely recycled. According to the National Academy of Sciences (NAS), recycling the waste water presently dumped into rivers, canals or the ocean would increase our water supply by 27%. The clean-up process is more rigorous than for tap water. The NAS reported that recent advances in technology and treatment design will reduce the chemical and microbial contaminants to levels comparable to many drinking water supplies. Desalinization sounds more palatable, but estimated costs run one-half to two-thirds more than recycling waste water. Moreover, it is limited to seawater proximity. Orange County opened their "Groundwater Replenishment System" in 2008 that produces 70,000 gallons of water every day. Born of necessity, the system is modeled after NASA's space station. The idea may repulse or disturb many people ("From my toilet?"), but get over it, people.

"I LOVE YOUR NIGHTLY BACK RUB, BABE."

Historically, the responsibility for contraception has been with the female. Recent studies at the Los Angeles Biomedical Research Institute at UCLA Medical Center focused on the use of a dermal gel of testosterone and Nestorone as a male contraceptive. At the Endocrine Meeting and Expo in Houston, chief investigator Dr. Christina Wang, described the effectiveness of the hormone combination in 99 volunteer male subjects. Dr Wang is a recognized world authority endocrinologist/andrologist, The protocol called for the drug to be applied like a skin lotion over a period of six months. Of the 56 subjects who completed 20 weeks of study, 89% had a reduced sperm count to 1 million per milliliter, considered too low to provide fertilization. Depending on dosage there was a complete absence of sperm in 79%. Few side effects were recorded, and sperm counts returned to previous levels after completion of the study. Leader of the team, Dr. Wang emphasized that the study is limited and much more research is necessary to establish their findings.

AT EASE, DISEASE. THERE'S FUNGUS AMONG US.

Exserohilum rostratum is a common fungus found predominantly in rotting wood and plants. Its pathogenicity is virtually nil. It cannot infect lungs, skin, or GI tract. Leave it to the pharmaceutical industry to produce meningitis and joint infections in epidemic numbers. Over 386 cases have been reported in the past two months with 30 deaths and more reports every day. So far, 19 states have found cases of Exserohilum meningitis. The New England Compounding Center, a production lab in Framingham, Massachusetts, was found to be the source of contaminated vials of methylprednisolone. The Food and Drug Administration (FDA) working with the Centers for Communicable Disease and Protection (CDC) found the fungus primarily in patients injected for back or other joint pain. Because the fungus is slow-growing with a long incubation period, there are potentially thousands of patients yet to show signs of disease. Moreover, infectious disease experts are not sure how to establish a protocol for therapy. In any case, anti-fungal medication will be needed for weeks to months.

HOLY RITUAL CAN BE CARRIED TOO FAR!

Since the year 2000 the CDC has found eleven cases of herpes simplex virus in male infants who were circumcised by ultra-Orthodox Jewish mohelim. The infections resulted from saliva deposited by the mohelim who practiced an ancient method of blood removal by sucking the wound. In September New York City's Department of Health ordered the mohelim to warn the parents of the danger and require a written consent for the ritual. In October three rabbis and three Jewish organizations challenged the order in federal court. Their argument is that Jewish law "requires" that particular method of blood removal. Of the eleven cases reported, nine boys had to be hospitalized and two died.

THREATEN AN ANGRY PUSSY AND PRODUCE CATASTROPHE.

In Cleveland, Texas, (near Houston) a man had to be air-lifted to a trauma unit after he lost a battle with a house cat. Armed with a knife, the man confronted the feline, but the animal caused him to lose his balance and fall on his weapon. His injuries were so severe he required emergency care. The report stated the cat was injured as well. No doubt the man will receive a complaint from the SPCA.

ADDENDA

- Siberian tigers, river otters and polar bears are all blind at birth.
- In 1991 there was one skyscraper in Dubai. Today there are 300.
- I am fluent in three languages…English, sarcasm and profanity. I wasn't very good in French or Italian, but I excelled in Thousand Island.
- I do not believe in an after life, although I am bringing a change in underwear.

ALOHA AND KEEP THE FAITH rts

(Editorial comment is strictly that of the writer.)