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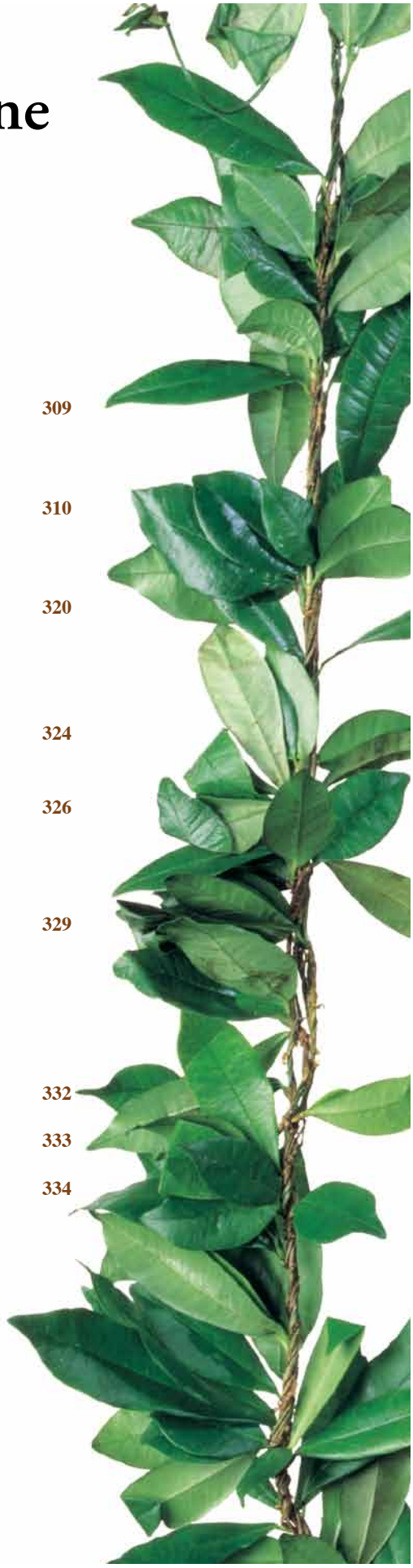

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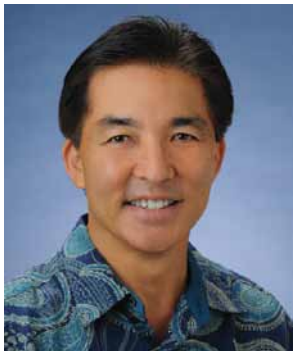

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EDITORIAL

Exposure of Patients to Ionizing Radiation. What are the Risks?

Michael J. Meagher MD, FACR; Co-Editor, Hawai'i Journal of Medicine & Public Health

Over the last 35 years, exposure of the general public to ionizing radiation for medical purposes has increased remarkably. Primarily due to frequent use of Computerized Axial Tomography (CT) in the detection and monitoring of many pathologies, in both intpatients,[1] and outpatients,[2] dose delivery to the population has increased from 3.6 mSev to 6.2 mSev[3] from 1980 to 2006. In 1980, 20% of total patient exposure was medically related whereas, in 2006, 51% of the total was medically related (4). This increase, amplified and distorted by the electronic and print media, has led to unease and fear among patients who have clear need for imaging studies. I would like, therefore to review the appropriate literature, indicate the degree of trust we may or may not place in these findings, and offer conclusions we may accurately convey to our patients.

First: The use of techniques involving ionizing radiation has proliferated, particularly with respect to the use of CT. This increase is ubiquitous, occuring in all populations and methods of reimbursement.[5]

Second: There is little to no useful data dealing with exposure of human populations to low level radiation. The data previously used to derive risk rates from imaging procedures has been extrapolated from higher doses (BEIR V11 data)) using controversial techniques.[6]

Third: We must separate relative risk from absolute risk, the key to allowing an understandable conclusion. Relative risk increase is clearly documented, being dose and age dependent as demonstrated in multiple studies.[7,8] Incremental absolute risk (benefit to risk ratio) is dependent on the underlying pathology[9] and has been much more difficult to measure, requiring accurate data acquisistion and analysis using meticulous technique. Happily, the Welsh have done it. Pearce, et al, showed,[10] in a population with no pre-existing neoplasms, that exposure to 3 thorax / abdomen scans or 5-6 head scans increased relative risk of lymphoma / leukemia by three times. The cumulative absolute risks (experimentally measured and not extrapolated from high dose patients) however, remained small: one excess case of leukemia, one excess case of brain neoplasm per ten thousand head scans (.01-.02%). This is the most accurate measurement that we have to date and appears quite valid.

Fourth: Any discussion of "risk" involving imaging procedures must include a more significant issue: incorrect diagnosis. Literature over the last 40 years has addressed this topic, showing marked variation in error rates. Berlin's article clearly summarizes the topic and notes an apparently irreducible error rate of 3–4 %.[11] This rate is stable over multiple studies and also applies to children.[12]

Conclusions: The recent discussions in the media sensationalizing radiation dosage morbidity and mortality require a balanced analysis in order to evaluate our approach to imaging for our patients. The best references for an inquiring patient or health care worker are #6 & #10. They are clear, as scientifically accurate as possible, and cover the topic evenly. The full text of #6 is available online without charge. We must also accept that unnecessary radiation can have deleterious effects without measurable benefit and that a major risk is the apparent irreducible error rate of 3-4%.

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Assessing Physical Activity and Related Correlates Among Adults in Hawai'i

Yuliang Zou PhD; Miaoxuan Zhang MS; and Jay E. Maddock PhD

Abstract

Regular physical activity has been shown to reduce the risk of cardiovascular disease, stroke, some mental illnesses and some cancer. Despite the well-known benefits of physical activity, about half of the adults in the United States and Hawai'i do not get enough. Rates of physical activity differ greatly among ethnic groups and interventions to increase physical activity may need to be tailored for specific ethnicities. In this study, 3,588 adults living in Hawai'i completed a random digit dial survey on their physical activity level. Native Hawaiians and Whites were more likely to be active than Chinese, Filipino and Japanese respondents. Multivariate logistic regressions analyses eliminated differences between Whites, Filipinos and Chinese respondents; however, Native Hawaiians were still more likely to report meeting physical activity guidelines and Japanese were less likely. Other significant predictors included being younger, male, having a job involving heavy labor, being in the normal weight range, being in good or excellent health, having high self-efficacy, spending less time sitting, and walking a dog more frequently. Differences in meeting physical activity guidelines can be used in planning future public health campaigns.

Keywords

Physical Activity, Population, Cross-sectional, Adults

Physical Activity (PA) is well known to be beneficial for health and well being.[1,2] Low levels of PA are recognized as a major risk factor for the development of several chronic diseases.[3] Determinants of PA have received increasing attention in recent years.[4] PA is a complex behavior with multiple determinants and pathways to maintain or change. Among the well-documented main factors related to the overall PA levels are demographic and intrapersonal characteristics, such as sex, age, socioeconomic status, educational level, attitudes and beliefs.[4] Environmental factors such as physical environmental (built environment, weather) and social environment (family, friends school and workplace) are also correlated with overall PA levels.[5,6]

The determinants of PA in previous studies are mainly classified into five categories: (1) Demographic and genetic; (2) Psychological, cognitive, and emotional; (3) Behavioral attitudes and skills; (4) Social and cultural; (5) Physical environmental.[4] The first three categories can be grouped together as intrapersonal or individual factors and categories 4 and 5 as interpersonal and environmental factors respectively. Intrapersonal factors have been studied more thoroughly. These five categories are often analyzed as being independent, but there are always correlations or interactions among them.

Current US guidelines recommend that all healthy adults need to engage in moderate-intensity aerobic physical activity for a minimum of 150 minutes per week, or vigorous-intensity aerobic activity for a minimum of 75 minutes on 3 days per week.[7] Combinations of moderate and vigorous intensity activity can be performed to meet these guidelines[7].

The ethnic mix of the population in Hawai'i is quite different from the US mainland and most Western countries. Five main ethnic groups account for more than 80% of the population. These are Native Hawaiian, Filipino, Japanese, Chinese and White. Ethnicity is a representation of racial and cultural backgrounds, behavioral patterns, even traditional lifestyle. Ethnicity is often considered as a proxy for unmeasured social factors in studies of public health.[8,9] Because of interracial marriage, many people in Hawai'i are multi-ethnic. The diversity of ethnicities in Hawai'i provides a fertile ground for the study of culturally-mediated public health issues.

Health behaviors, such as diet, physical activity, and smoking, are highly influenced by societal culture and ethnic variations. Since no single theory encompasses all factors related to meeting recommendation of PA, Social Cognitive Theory (SCT) and the Trans-Theoretical model (TTM) were recommended by the Surgeon General as organizing frameworks to help design interventions for PA promotion.[10] Within the framework of SCT, potentially associated factors are classified into three categories: social-demographic, personal, and behavioral.

The aims of the present study were to (1) investigate the prevalence of meeting PA recommendations among different ethnicities in Hawai'i; (2) analyze individual and environmental factors in relation to physical activity; and (3) compare physical activity patterns between participants who did and did not meet the current public health recommendations.

Methods

Procedure and Sample

The Healthy Hawai'i Initiative (HHI) Cross-Sectional Survey (2010) was developed to track nutrition and physical activity behaviors over time. Telephone surveys of residents of the state of Hawai'i between the ages of 18 and 54 were collected over the course of the year.

A professional survey firm in Honolulu was contracted to complete the interviews. They utilized their in-house sample generating software to produce the Random Digit Dialing (RDD) sample. The software generates simple random samples for the entire household population of Hawai'i or any segment of that population. The sample included both listed and unlisted telephone numbers and landline and cell phones with a disproportionate design across counties and a random sampling strategy within each county. The sample size of 3,600 interviews in qualified households was stratified across islands as follows: 1,800 from Oahu, 600 from Hawai'i, 600 from Kaua'i, 500 from Maui, 75 from Moloka'i and 25 from Lana'i. Hawai'i, Maui (including Moloka'i and Lana'i) and Kaua'i counties were oversampled to provide large enough sample sizes to examine county specific data. The response rate for the survey was 16.2%. Missing data for the study was minimal with most variables having less that 1% of the data missing. Only income

had significant missing data with 84.9% of the respondents answering this item.

Because of the length of the survey, two forms were generated. Each respondent completed a standard set of behavior questions and then one of two optional modules was randomly administered. This way, approximately half the respondents were asked about perception of environment and half the respondents were asked about other health conditions. All interviewers for this project were diligently trained and supervised by the professional call center management team and project director before being assigned to this project. Constant supervision by the call center supervisors was maintained throughout the entire study. Interviews and data entry were accomplished using the Computer Assisted Telephone Interviewing (CATI) system, which uses programmable software that includes error editing routines to protect against most standard interviewer errors. Additionally, research staff consistently followed quality control procedures. Professional research staff checked, cleaned and labeled the complete data set before submitting it to the University of Hawai'i for analysis. Calls were made on both weekdays and weekends. Call times ranged from late morning through the evening. Each number was attempted up to four times to try to complete the survey.

Measures

Physical Activity

The main outcome variable (meeting PA recommendations) was measured using standardized questions from the International Physical Activity Questionnaire – short version (IPAQ).[11] Two types of PA were assessed: (1) Moderate PA: makes you breathe somewhat harder than normal and may include carrying light loads, bicycling, and playing tennis. (2) Vigorous PA makes you breathe much harder than normal and may include heavy lifting, digging, aerobics, running or fast bicycling.

The PA module included questions about the frequency (days a week) and duration (min) of various levels of intensity (vigorous, moderate) of PA. The respondents were classified into two categories: meeting or not meeting recommendation of PA based on 150 minutes a week of moderate or 75 minutes a week of vigorous activity or a combination of both.

Social-demographic Factors

Social-demographic factors such as gender, age, ethnicity, education, marital status, household income, and occupational category were collected. Respondents who identified with more than one ethnicity were asked to select the ethnicity that best described them.

Personal Factors

Five personal factors were assessed: Body Mass Index (BMI) calculated based on self-reported height and weight, general health, stage of change, and self-efficacy. General health was classified into five groups (from excellent to poor). Stage of change classified respondents into five stage of change depending on their motivation and behavior: precontemplation, contemplation, preparation, action and maintenance. Self-efficacy (Cronbach's alpha = .65) was measured using three questions on a four point Likert scale from not at all confident to very confident and averaged to create the scale.

Behavioral Factors

The amount of time in hours spent sitting, watching TV, and playing video games on a typical weekday was collected. The time spent walking to work after parking the car or getting off the bus and the time spent walking or riding a bicycle from home to work was also collected.

Statistics Analysis

Data on participant's characteristics are described by ethnicity, mean and standard deviation for normally distributed continuous variables, median and inter-quartile range for skewed distributed continuous variables, and percentage for categorical variables. Chi-square test for categorical data was used to compare the characteristics of subjects by ethnicity. Bivariate and multivariate analysis produced multiple binary logistic regression models to examine the association between the independent variables and whether PA recommendations were met. Odds Ratios (ORs) with 95% Confidence Interval (CI) were calculated. Statistical analysis was conducted using SPSS, version 19.0. A p-value $\leq$ 0.05 was considered significant. All statistical tests were 2-sided.

Results

Participant Characteristics

Analysis involved the 3588 (99.7%) participants aged 18 to 54 years who provided physical activity data. Characteristics of the participants are shown in Table 1. The sample was 59% female; 30% had a high school education or less; 54% were married; 15% households earned less than $25,000 and 45.0% more than $75,000 annually; 30% were White, 16.4% were Native Hawaiian, 15.2% were Japanese, 14.7% were Filipino and 4.2% were Chinese. Overall, 31.2% were overweight and 24.9% were obese; nevertheless, 79.5% reported being in good to excellent health. (See Table 1)

About half (49.1%) of the adults in Hawai'i met PA recommendations. There were large differences by ethnic group with a larger proportion of Whites (52.8%) and Native Hawaiians (52.8%) meeting PA recommendations when compared to Chinese (45%), Filipinos (43.7%) and Japanese (37.8%). Table 2 displays physical activity and sedentary behavior by ethnicity. Statistically significant differences were found in most of the behavioral variables across ethnicities. Among all the ethnicities, the Japanese, Filipinos and Chinese were most likely to have sedentary lifestyle. (See Table 2)

Factors Associated with Meeting Recommendations for Physical Activity

Bivariate results are shown in Table 3. Compared to Whites, Filipinos and Japanese are less likely to meet PA recommendations. As far as other social-demographic factors were concerned, males, younger people, those never married, and individuals

Table 1. Subject Social-demographic Characteristics by Ethnicity (%)							
Variable	**White (n=1074)**	**Native Hawaiian (n=590)**	**Chinese (n=151)**	**Filipino (n=522)**	**Japanese (n=547)**	**Others (n=704)**	**Total (n=3588)**
Gender* (n=3588)							
Female	60.3	64.7	46.3	61.2	57.6	55.8	59.3
Age (years)* (n=3588)							
18-30	20.3	31.7	31.5	33.9	22.6	41.0	28.6
31-45	33.9	35.6	23.5	39.0	31.1	33.2	33.8
46-54	45.8	32.7	45.0	27.2	46.3	25.8	37.6
Education* (n=3585)							
1st to 12th grade	20.9	47.7	15.4	36.6	18.2	39.2	30.1
Some College	58.6	46.5	61.7	57.9	67.4	49.8	56.5
Graduate School	20.5	5.8	22.8	5.5	14.4	11.0	13.4
Marital status* (n=3585)							
Married	62.1	47.6	49.7	57.9	52.6	46.5	54.3
Widowed	0.9	1.5	2.0	0.8	1.0	0.8	1.0
Divorced/Separated	9.3	13.2	4.1	5.2	6.6	8.2	8.5
Never married	22.1	29.6	38.9	30.6	36.0	35.2	29.9
Not married but living with partner	5.7	8.0	5.4	5.5	3.7	9.3	6.4
Household income* (n=3045)							
Less than $25,000	13.5	21.5	5.7	15.0	6.9	21.2	14.9
$25,000-49,999	16.3	18.1	19.7	22.1	14.5	22.7	18.3
$50,000-75,000	22.0	22.9	18.0	24.0	21.6	19.5	21.7
More than $75,000	48.3	37.6	56.6	39.0	57.0	36.6	45.0
Occupational Activity Level* (n=3568)							
Mostly sitting or standing	58.1	51.3	68.5	49.7	63.4	51.4	56.0
Mostly walking	29.2	30.5	20.8	35.2	25.9	32.2	29.8
Mostly heavy labor	10.5	15.5	6.7	12.9	9.2	15.2	12.0
Body Mass Index* (n=3581)**							
Normal (BMI: 18.5~24.9)	48.2	29.7	58.4	43.2	45.5	45.4	44.0
Overweight (BMI:25~29.9)	30.8	29.3	28.9	37.1	31.6	28.9	31.2
Obese (BMI>30)	21.0	41.0	12.8	19.7	22.8	25.7	24.9
General Health* (n=3588)**							
Excellent	18.0	8.9	13.4	10.7	7.4	13.6	12.8
Very good	37.7	26.0	29.5	27.8	29.9	28.3	31.1
Good	32.0	35.4	40.9	35.3	41.0	35.8	35.6
Fair	9.7	21.7	15.4	18.9	17.6	17.3	15.9
Poor	2.6	7.9	0.7	7.3	4.1	5.0	4.7

Frequencies were compared across ethnicities, *p<0.05, **p<0.01, ***p<0.001

Table 2. Description of Personal and Behavioral Variables by Ethnicity							
Variable	**White (n=1074)**	**Native Hawaiian (n=590)**	**Chinese (n=151)**	**Filipino (n=522)**	**Japanese (n=547)**	**Others (n=704)**	**Total (n=3588)**
Meeting Physical Activity Recommendations* (n=3575)**							
	52.8	52.8	45.0	43.7	37.8	54.9	49.1
Stage of Change* (n=3488)**							
Precontemplation	10.3	9.3	20.9	11.7	20.1	10.3	12.4
Contemplation	10.6	15.2	15.8	16.6	19.8	12.5	14.3
Preparation	13.1	16.3	10.1	17.4	16.5	14.4	14.9
Action	9.7	17.0	8.6	18.2	10.9	15.7	13.3
Maintenance	56.3	42.2	44.6	36.2	32.8	47.0	45.1
Days of walking in last week for at least 10 minutes at a time (days), Mean (s.d.)* (n=3578)**							
	4.4(2.5)	4.3(2.5)	4.0(2.6)	4.0(2.5)	3.4(2.6)	4.3(2.6)	4.1(2.5)
Total time spend on walking last week (minutes), Med(IQR)* (n=3538)**							
	140(60,300)	140(60,260)	119.5(30,210)	120(45,210)	90(15,210)	127.5(45,270)	120(45,240)
Hours spend sitting on a weekday during last week, Med(IQR)* (n=3475)**							
	5(3,8)	5(3,8)	6(4,8)	4(2,6)	6(4,8)	5(3,8)	5(3,8)
Hours spend on watching TV on a typical day, Med(IQR)* (n=3573)**							
	2(1,3)	2(1,3)	2(1,3)	2(1,3)	2(1,3)	2(1,3)	2(1,3)
Hours spend on video games on a typical day, Med(IQR)* (n=3583)							
	1(1,2)	1(0,2)	1(1,3)	1(0,2)	1(1,2)	1(0,3)	1(1,2)
If drive, time of walking from parking lot to work, (minutes), Med(IQR)* (n=2487)**							
	2(1,5)	2(1,5)	3(1,5)	2(1,5)	2(1,5)	2(1,5)	2(1,5)
If ride the bus, time of walking from bus stop to work, (minutes), Med(IQR) (n=241)							
	14(5,21)	17(5,28)	10(8,18)	15(10,20)	6(5,12)	14(5,20)	12(5,20)
If walk or bike, time of walking or riding to work (minutes), Med(IQR) (n=261)							
	15(7,20)	15(10,30)	15(8,38)	15(10,20)	15(10,20)	18(10,30)	15(10,25)
Usual way to get to work (%)* (n=3573)**							
Drive/carpool	65.2	71.6	75.2	73.7	80.3	62.8	69.9
Bus	5.2	7.1	8.7	9.7	2.4	10.3	6.7
Walk	6.1	5.3	4.0	5.3	4.6	7.9	5.8
Bicycle	1.7	1.0	2.0	0.8	1.0	2.3	1.5
Do not work outside the home							
	21.8	15.0	10.1	10.5	11.7	16.6	16.0
Have a dog or not* (n=3589)**							
Yes	45.2	52.6	33.6	42.3	45.6	42.0	45.0
No	54.8	47.4	66.4	57.7	54.4	58.0	55.0
Frequency to walk dog* (n=1610)[1]**							
Never	23.5	43.0	36.0	48.1	40.5	32.2	35.7
Once or less than once a week	12.9	13.1	8.0	9.8	20.1	14.8	13.9
More than once a week	61.8	43.9	56.0	42.1	39.4	53.0	50.4

Med, median; IQR, inter-quartile range.
Frequencies or medians were compared across ethnicities, *p<0.05, **p<0.01, ***p<0.001.
[1]Only those respondents who reported having a dog were included in this variable.

Table 3. Factors Associate with **Meeting Physical Activity Recommendation** on Bivariate Analysis			
Variable	**OR**	**95%CI**	**P-value**
Social-demographic Factors			
Gender (n=3594)			
Male	1.00		
Female	0.42	0.37~0.49***	<0.001
Age (years) (n=3594)			
18~30	1.00		
31~45	0.60	0.51~0.71***	<0.001
46~54	0.55	0.47~0.65***	<0.001
Ethnicity (n=3575)			
White	1.00		
Native Hawaiian	1.00	0.82~1.23	0.988
Chinese	0.73	0.52~1.03	0.072
Filipino	0.69	0.56~0.86**	0.001
Japanese	0.54	0.44~0.67***	<0.001
Others	1.09	0.90~1.32	0.400
Education (n=3588)			
1st to 12th grade	1.00		
College	0.88	0.76~1.02	0.086
Graduate	1.04	0.84~1.29	0.722
Marital status (n=3486)			
Married	1.00		
Divorced	0.93	0.71~1.22	0.615
Never married	1.43	1.23~1.66***	<0.001
Not married but living with partner	1.37	1.04~1.80*	0.025
Household income (n=3036)			
Less than $25,000	1.00		
$25,000-$49,999	0.82	0.64~1.05	0.112
$50,000-$75,000	0.84	0.66~1.06	0.139
More than $75,000	1.00	0.81-1.24	0.999
Occupational Activity Level (n=3571)			
Mostly sitting or standing	1.00		
Mostly walking	1.61	1.39-1.87***	<0.001
Mostly heavy labor or physically demanding work	2.94	2.35-3.67***	<0.001
Don't work	0.75	0.46-1.21	0.234
Personal Factors			
BMI (kg/m2) (n=3582)			
Normal (18.5~24.9)	1.00		
Overweight (25~29.9)	0.96	0.82~1.12	0.575
Obese (>30)	0.58	0.49~0.69***	<0.001
General Health (n=3592)			
Excellent	1.00		
Very good	0.57	0.45~0.72***	<0.001
Good	0.36	0.29~0.46***	<0.001
Fair	0.27	0.21~0.35***	<0.001
Poor	0.17	0.12~0.26***	<0.001

Table 3. continued

Variable	OR	95%CI	P-value
Self-efficacy (n=3511)	1.441	1.39~1.49***	<0.001
Behavioral Factors			
Hours spent sitting on a weekday during last week (n=3481)	0.93	0.91~0.94***	<0.001
Hours spent watching TV on a typical day (n=3577)	0.92	0.89~0.95***	<0.001
Hours spent video games on a typical day (n=3586)	1.00	0.97~1.03	0.910
Usual way to get to work (n=3578)			
Drive/carpool	1.00		
Bus	0.94	0.73~1.23	0.669
Walk	1.73	1.29~2.31***	<0.001
Bicycle	2.64	1.45~4.83**	0.002
Do not work outside the home	0.80	0.67~0.96*	0.018
Have a dog or not (n=3592)			
Yes	1.00		
No	0.97	0.85~1.10	0.602
Frequency of dog walking (n=1613)[1]			
Never	1.00		
Once or less than once a week	0.92	0.70~1.21	0.545
More than once a week	1.54	1.31~1.80***	<0.001

*p<0.05, **p<0.01, ***p<0.001.
[1]Only those respondents who reported having a dog were included in this variable.

with a non-sedentary job were more likely to meet PA recommendations. Personal and behavioral factors associated with meeting PA recommendations were: not obese, in excellent health, spending less time sitting or watching TV, commuting to work by walking or cycling, and walking the dog more than once per week. Education level and household income were not significantly associated with meeting PA recommendations.

The results of multivariate analyses are shown in Table 4. Specific physical activity variables (e.g. Days walked 10 minutes or more) were excluded from the independent variable list. However, the type of transportation to get to work was included. In the final model, after adjusting for covariates, significant predictors for meeting PA recommendations included being male, younger, Native Hawaiian, having a job involving mostly walking or heavy labor, being in the normal or over-weight range, being in excellent health, having high self-efficacy, spending less time sitting, and walking a dog more frequently. Japanese were less likely to meet recommendation of PA when compared to other ethnicities.

Discussion

This study examined several factors related to adults meeting physical activity guidelines in Hawai'i. The proportion of adults in Hawai'i meeting recommendation of PA in this sample was 49.1%, and is just below the range reported by the Behavioral Risk Factor Surveillance System (BRFSS) between 2001 and 2009 (49.8~53.2). There were large differences by ethnic group with Whites (52.8%) and Native Hawaiians (52.8%) reporting much higher levels than Chinese (45.0%), Filipinos (43.7%) and Japanese (37.8%).

The results appear to be in line with previous studies about the relationship between PA and intrapersonal factors in which men, younger people and Whites were more likely to meet PA recommendations.[4] Gender and age continue to be the two most important demographic correlates of PA behaviors in adults in Hawai'i. As for ethnicity, the logistic regression model gave different results depending on the variables entered. When there were only social-demographic variables (Model 1), the results showed that compared with Whites, Chinese, Filipino, and Japanese people are less likely to meet PA recommendations. But when the personal factors were included (Model 2), the ORs for Chinese and Filipino people were no longer statistically significant, whereas the OR for Japanese was still significant. The results were similar for the final regression. In the full model, Native Hawaiians were more likely to meet PA recommendation than Whites. The differences among models may be interpreted as racial/ethnic variation in personal or behavioral factors. Our results indicate that personal and behavior factors were more important determinants of meeting PA recommendations than ethnicity, and ethnicity may just be a marker for personal and behavioral characteristics.

Occupational activity level was one variable not typically included in previous studies.[14] As a recent review pointed out, it is difficult to draw overall conclusions of the relationship between occupation categories and leisure time PA since the measure of occupational activity level varied heavily across

Table 4.Factors Associate with **Meeting Physical Activity Recommendation** on Multivariate Analysis			
Variables	**Model 1 Social-demographic OR (95% CI)**	**Model 2 Social-demographic + personal OR (95% CI)**	**Model 3 All factors OR (95% CI)**
Social-demographic			
Gender			
Male	1.00	1.00	1.00
Female	0.45(0.39~0.52)***	0.47(0.40~0.55)***	0.46(0.39~0.55)***
Age (years)			
18~30	1.00	1.00	1.00
31~45	0.59(0.49~0.72)***	0.61(0.50~0.75)***	0.63(0.51~0.78)***
46~54	0.56(0.47~0.68)***	0.54(0.44~0.67)***	0.56(0.45~0.69)***
Ethnicity			
White	1.00	1.00	1.00
Native Hawaiian	0.94(0.76~1.16)	1.23(0.97~1.57)	1.29(1.01~1.65)*
Chinese	0.66(0.46~0.95)*	0.89(0.60~1.34)	0.89(0.59~1.34)
Filipino	0.60(0.48~0.76)***	0.88(0.69~1.12)	0.91(0.70~1.17)
Japanese	0.52(0.42~0.65)***	0.72(0.57~0.91)**	0.76(0.60~0.97)*
Others	0.90(0.73~1.11)	1.06(0.84~1.33)	1.12(0.89~1.42)
Marital Status			
Married	1.00	1.00	1.00
Not married	0.92(0.81~1.05)	0.98(0.85~1.14)	0.99(0.86~1.15)
Occupational Activity Level			
Mostly sitting or standing	1.00	1.00	1.00
Mostly walking	1.64(1.40~1.91)***	1.43(1.21~1.70)***	1.30(1.09~1.56)**
Mostly heavy labor or physically demanding work	2.34(1.85~2.95)***	2.01(1.56~2.59)***	1.74(1.33~2.27)***
Don't work	0.71(0.43~1.17)	0.85(0.49~1.48)	0.86(0.47~1.58)
Personal Factors			
BMI (kg/m2)			
Normal weight		1.00	1.00
Overweight		0.92(0.77~1.11)	0.92(0.76~1.11)
Obese		0.69(0.56~0.85)***	0.73(0.59~0.90)**
General Health			
Excellent		1.00	1.00
Very good		0.70(0.54~0.91)**	0.67(0.51~0.87)**
Good		0.53(0.41~0.69)***	0.52(0.40~0.68)***
Fair		0.46(0.34~0.62)***	0.47(0.34~0.64)***
Poor		0.35(0.22~0.54)***	0.36(0.23~0.58)***
Self-efficacy		1.38(1.33~1.43)***	1.37(1.32~1.42)***
Behavioral Factors			
Hours spend sitting on a weekday during last week			0.96(0.94~0.98)***
Hours spend on watching TV on a typical day			0.97(0.94~1.01)
Usual way to get to work			
Drive/carpool			1.00
Bus			0.86(0.62~1.19)
Walk			1.26(0.89~1.77)
Bicycle			1.44(0.75~2.77)
Do not work outside the home			0.99(0.79~1.25)

Table 4. continued

Variables	Model 1 Social-demographic OR (95% CI)	Model 2 Social-demographic + personal OR (95% CI)	Model 3 All factors OR (95% CI)
Frequency to walk dog[1]			
Never			1.00
Once or less than once a week			0.90(0.65~1.24)
More than once a week			1.29(1.07~1.56)**

*p<0.05, **p<0.01, ***p<0.001.
[1]Respondents without a dog were classified into the never category.

the studies.[14] Our findings were different from a study in Australia which identified workers of lower occupational status as at high risk for not meeting the PA recommendations.[15] Using the Australian Standard Classification of occupation, four occupational categories were created for that study: professional, skilled, less skilled and homemaker. Included in the professional category were managers/administrators, professionals, and paraprofessionals. Trade-persons, clerical, and sales/service were classified as skilled workers. Laborers and plant operators were placed in the less skilled category. Participants who reported themselves as homemakers and did not report any paid employment or nominated occupation were included as a fourth occupational category. In our study, the occupation status was classified into 4 categories by how physical active the work is: mostly sitting or standing, mostly walking, mostly heavy labor or physically demanding work, and don't work outside of the home. Our multivariate analysis results indicated that the more physical active the work was, the greater the likelihood that PA recommendation was met. In other words, having an active job substantially contributes to overall physical activity levels.

Meeting Recommendation of PA and Personal Factors

The relationship between obesity and PA is complicated. In one longitudinal study, both PA and obesity were treated as dependent variables for overall health.[16] Obese people in this study were less likely to meet PA recommendations. Levels of general health have also been treated as an outcome variable in cross-sectional or longitudinal studies addressing the impact of physical activity. Our findings are consistent with previous studies that demonstrate that people with better health status were more likely to meet PA recommendations. Overall health status is an important indicator of functional ability. Functional ability variables important to PA comprise the capacity to undertake the activities and requirements of daily life as well as physical and mental well-being.[17] In a review of the social ecological model and PA in African American women, poor functional ability or perceptions of being in poor health have been associated with reduced participation in PA among African American women in community and clinical settings.[6]

Self-efficacy plays a very important role in behavior change and maintenance. Within the framework of SCT, self-efficacy was defined as one's confidence that he or she can regularly engage in PA in the face of salient impediments.[18] Previous research on psychosocial predictors of PA adoption and maintenance indicate that self-efficacy was more important for PA maintenance than PA adoption.[19] The results confirmed that high self-efficacy was associated with meeting PA recommendations.

Meeting Recommendation of PA and Behavioral Factors

The results showed that people who spent less time sitting on a weekday during the last week were more likely to meet PA recommendations. The total amount of time spent sitting included work time and time sitting at home. It is well known that time spent sitting during a typical day is one of the important indicators of sedentary life style. Similarly, frequency of walking the dog was another significant variable associated with meeting PA recommendations. Although time spent watching television and means of transportation to work, were significant in bivariate analysis, they were not significant in multivariate analysis. Our results indicate that social-demographic and personal factors were more important than behavioral factors in associations with meeting PA recommendation.

Recommendations for PA Intervention

The results demonstrated that several behavioral factors are important in meeting physical activity recommendations. Intervention for PA should be focused on behavior change using socio-cognitive framework to improve people's self-efficacy and change the behavior pattern. For different subgroups, strategies should be different. For example, among Chinese and Japanese communities, strategies should focus on providing health education on the benefit of PA. Because they usually are less likely to be overweight and obese, messages around weight loss may not be as salient. Native Hawaiian people in this study showed high levels of meeting PA recommendations but also high levels of obesity. Interventions may need to focus on dietary intake more than PA in this community. Overall, individually adapted behavior change is critical to facilitate a physically active lifestyle for all ethnic groups.[20]

Limitations of This Study

As with all cross-sectional research, the findings cannot be used to draw causal conclusions concerning determinants of meeting PA recommendation. Data was self-reported and is subject to recall bias and social desirability. Data in this study was not weighted because the study questions were examining the inter-

relationships between variables not population estimates. The high level of non-response also affects the ability to extrapolate rates to the population. Data presented in this paper should not be used to examine population prevalence.

Conflict of Interest

None of the authors identify any conflict of interest.

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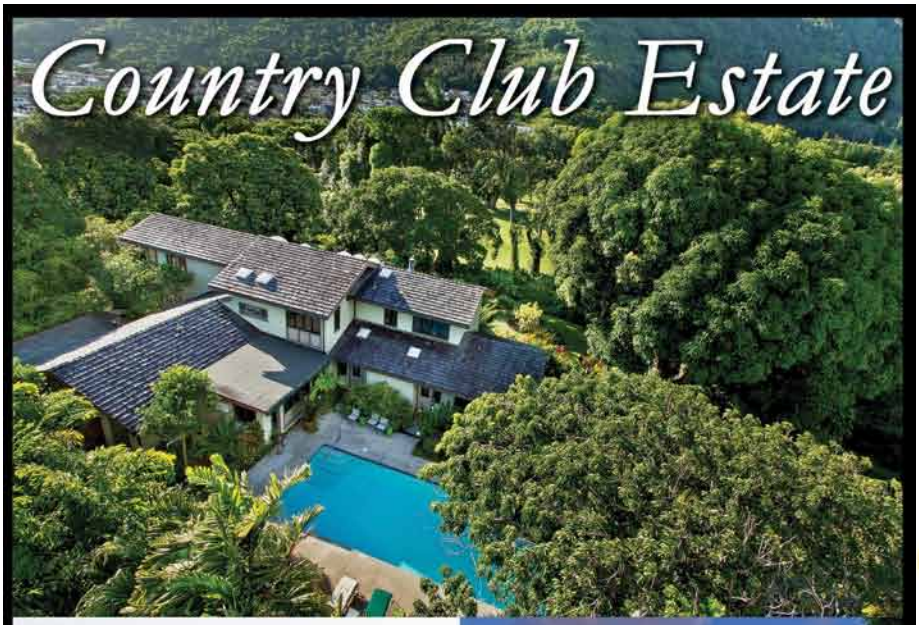

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Door-to-Balloon time in Acute ST Segment Elevation Myocardial Infarction – Further Experience

David J. Fergusson MD; Christian Spies MD ; Robert A. Hong MD; Catherine Young RN; and Suzanne Rinn Beauvallet RN

Abstract

Early coronary reperfusion has been established as the optimal treatment for acute ST segment elevation myocardial infarction. A treatment protocol, previously described, has been designed to reduce delay in achieving recanalization of the culprit coronary artery. Over a period of about 4 years, Door-to-Balloon time has been analyzed for patients arriving in the Emergency Department with this condition. During that time the process was enhanced by the ability of ambulance personnel to transmit 12 lead EKG's from the field. Door-to-Balloon times have been analyzed and compared to the American College of Cardiology target of 90 minutes. After just over one year of gradually improving results, 100% compliance was achieved. From that time on, this was achieved during the period under consideration in 97% of cases.

Introduction

It has been well established that the optimal treatment for acute ST segment elevation myocardial infarction (STEMI) is recanalization of the occluded coronary artery responsible for the infarct, by coronary angioplasty and stent placement, provided that this can be done in a timely manner. This results in improved left ventricular function and decreased mortality. Results of initial experience with this approach at The Queen's Medical Center have previously been reported.[1] With the addition of subsequent experience, cumulative results, now extending through the end of the second quarter of 2011, form the basis for this report.

Methods

A new protocol for management was implemented in May, 2007, based on Bradley et al.[2] This was described in our previous report and includes activation of the call to the cardiologist and cathlab staff by the emergency department physician, having a group of interventional cardiologists each committed to arrive within 20 minutes, activating a timer at patient arrival, and use of a designated sealed box containing needed supplies. Acceptable limits for time components were established, as listed in table 1. These have been analyzed, with prompt feedback to involved physicians and staff, within 48 hours. The records of all patients arriving in the emergency department with clinical and EKG evidence for STEMI have been scrutinized and entered into a database, in accordance with the specification manual of The Joint Commission and CMS core measures. Those fulfilling the criteria provide the basis for this report. This report combines the experience described earlier with that between October 2008 and June 2011.

A major innovation since the onset of the program has been the equipping of Honolulu City and County ambulances, in May 2008, with the capacity to record and transmit good quality twelve-lead EKG tracings from the field. This has permitted the emergency department physician to call in the cardiologist and the cardiac catheterization laboratory (cathlab) staff prior to the patient's arrival.

Results

A steady improvement in Door-to-Balloon time (D2B) followed initiation of the program. By the third quarter of 2008, the American College of Cardiology national guideline for D2B of less than 90 minutes[3] was being achieved in 100% of patients. The total experience is summarized in Figures 1 and 2. There has been nearly complete compliance with the 90 minute guideline for D2B, with failure to achieve this in only 4 instances (out of a total of 117), as noted in Figure 1. As seen in Figure 2, median D2B time has been around 60 minutes since 2009. Substantially shorter times have often been achieved, including less than 20 minutes on 2 occasions. Hospital mortality has been 4.7% for the whole group and 4.0% since the time at which 100% quarterly compliance with the 90 minute guideline was first achieved.

Discussion

STEMI is usually caused by acute thrombotic occlusion at the site of a ruptured atherosclerotic plaque. Early recanalization of the artery has been well established as the optimal treatment. As described by Bradley, et al,[2] small reductions in time at various stages of the process added up to a significant decrease in the total D2B time, in our experience. Acceptable time limits are noted in Table 1. Any such subdivisions of the total D2B time that are longer than acceptable are investigated, including discussion with individuals and departments involved.

This approach resulted in a steady improvement in the measures being evaluated, as noted above. In fact the improvement started before the program was formally instituted, presumably as a result of increased awareness of existing problems while planning was in progress. Following the initiation of the program, in May, 2007, improvement continued over the next year, as caregivers became increasingly familiar with the protocol, and has largely been maintained. Maintenance of a satisfactory D2B time has been an ongoing challenge, given a 24/7 operation involving a busy emergency department, and vigilance is needed to insure continued success. Continued regular meetings of the D2B committee, with prompt feedback to involved individuals, has been felt to be the key to success. While we have been gratified to achieve the results described, we hope to effect further improvements in patient outcomes, by incorporating new innovations in cathlab and adjunctive techniques. In a process where time is crucial, there is an advantage to a uniform approach by all operators, and to using methods

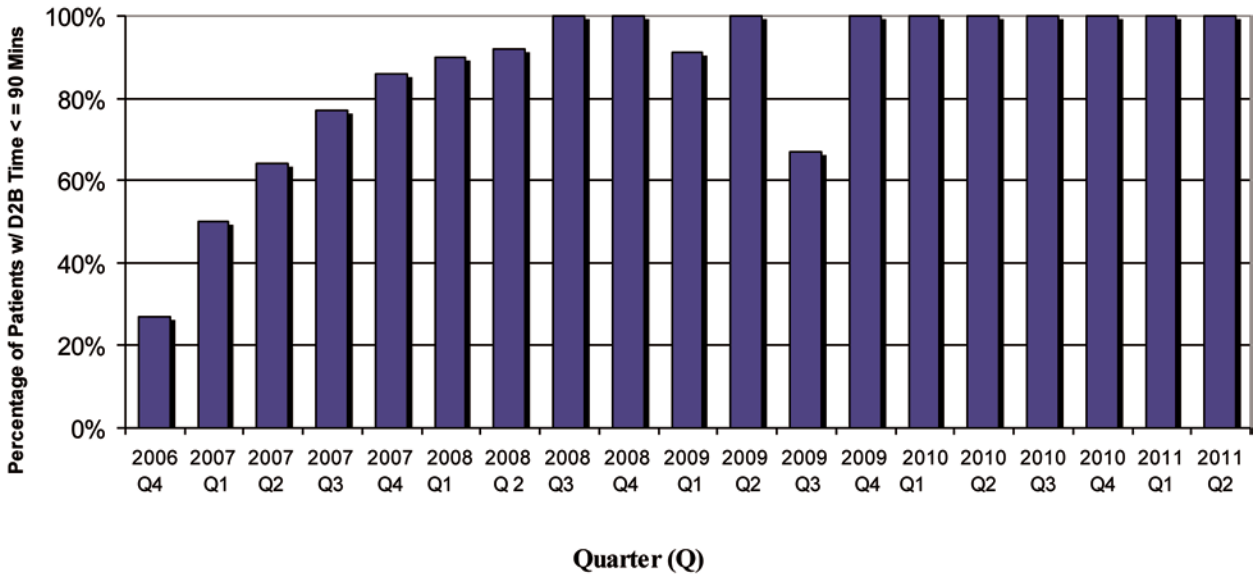

Figure 1. Percentage of STEMI patients with Door-to-Balloon time of 90 minutes or less by quarter.

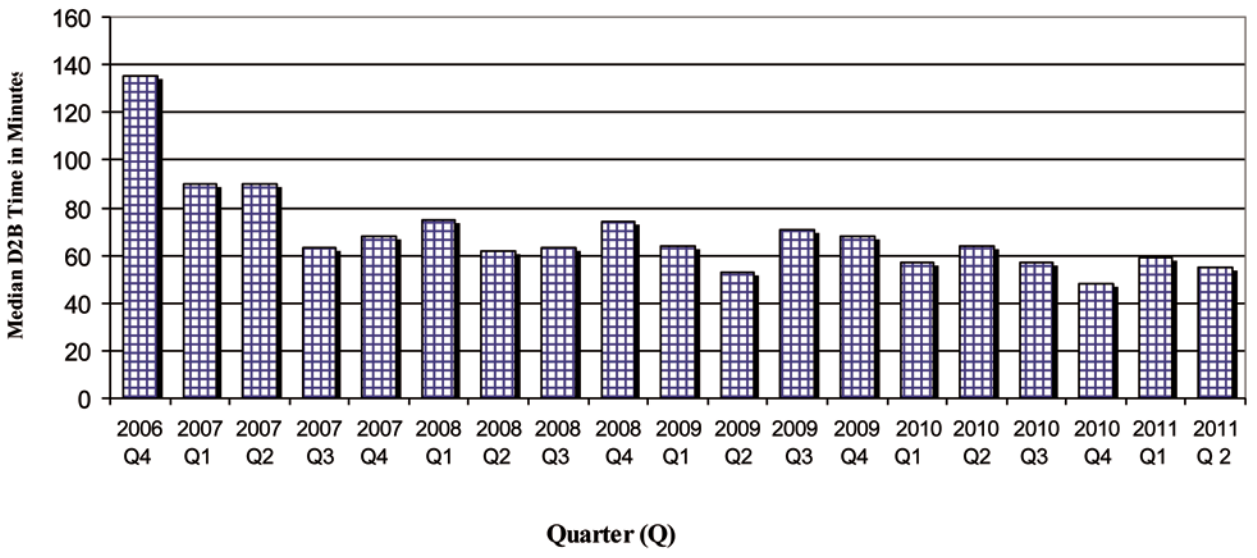

Figure 2. Median Door-to-Balloon time, for patients with STEMI, by quarter.

Table 1. Specific components of the Door-to-Balloon timeline and their time interval goals.

	Minutes
1. ED door to EKG	10
2. EKG to STEMI alert	5
3. STEMI alert to interventional cardiologist arrival	30
4. ED door to cathlab door	60
5. Cathlab door to balloon	30

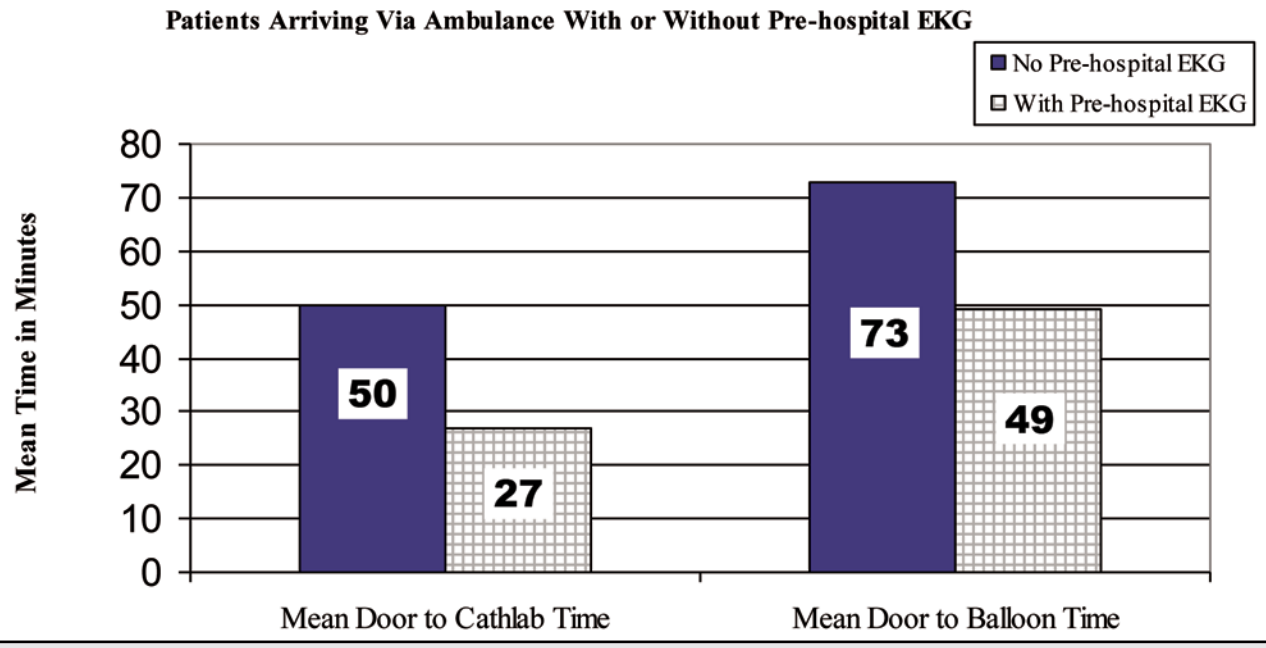

Figure 3. Effect of pre-hospital EKG on times involving STEMI patients arriving by ambulance.

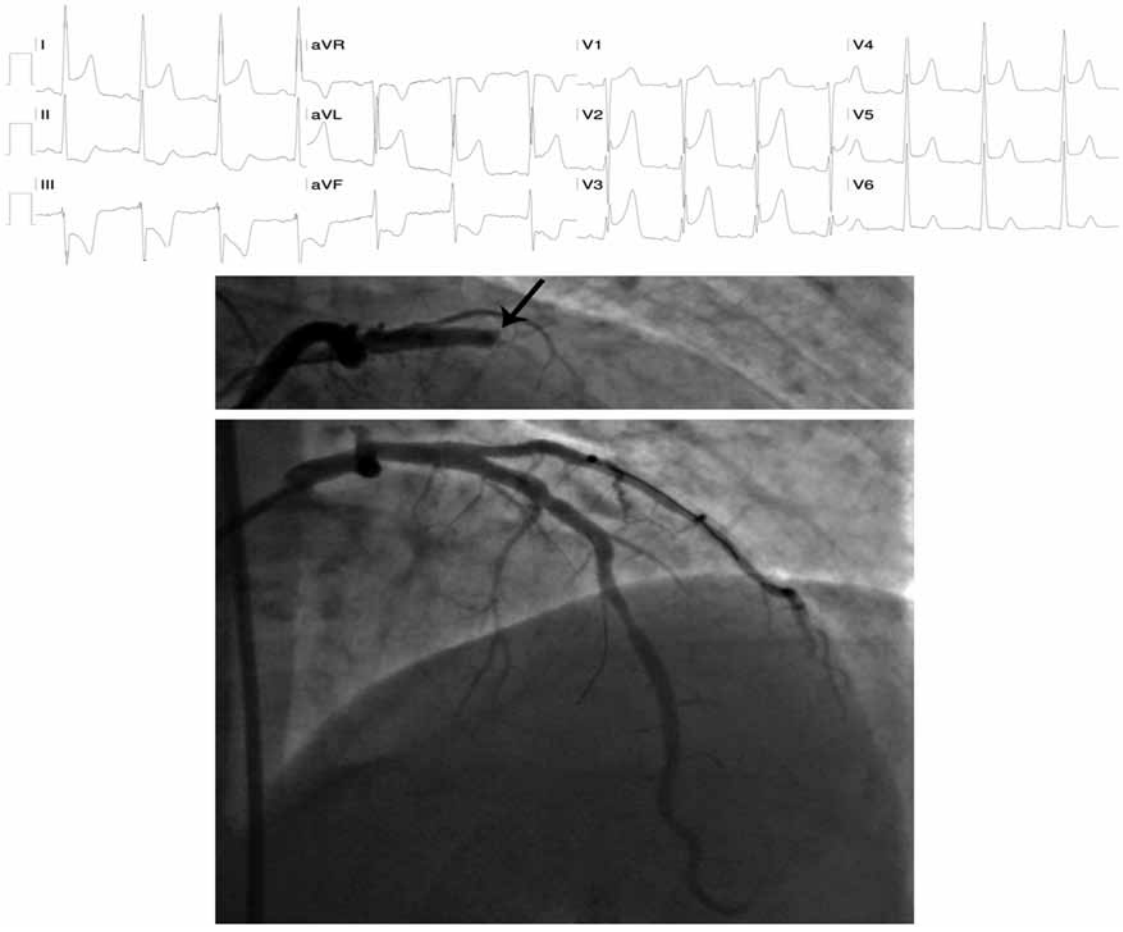

Figure 4. Example of acute anterior STEMI, demonstrated by pre-hospital EKG, with angiogram showing occluded anterior descending coronary artery (arrow), subsequently relieved by angioplasty and stent placement.

that do not risk causing delay. These considerations need to be balanced against the potential advantages of modifying the process, to incorporate changes shown to improve prognosis. Such newer techniques were used in a small minority of the cases under review, and are not considered to have impacted outome of the group as a whole. They include:

a. Radial artery as access site. Reduced complications and improved prognosis have been reported with this approach in the STEMI subset of the RIVAL study.[4] While our cardiologists use radial access for most elective cases, the femoral artery has usually been used for STEMI patients, because of greater predictability of rapid access. An appropriate process may be to allot a period of perhaps 5 minutes, strictly timed, for radial access, with default to femoral approach if not successful in that time.

b. Antithrombotic measures. The use of bivalirudin, in place of heparin and a glycoprotein IIb/IIIa inhibitor has been shown to reduce hemorrhagic complications and mortality,[5] and has been increasingly employed. Selection of oral anti-platelet therapy is also important, especially when bivalirudin is used during the intervention. Prasugrel has been associated with fewer recurrent infarctions and ischemic complications than clopidogrel, probably without increased bleeding risk.[6] Ticagrelor use has reduced mortality and decreased stent thrombosis compared with clopidogrel, without increase in major bleeding.[7] These newer agents are likely to be increasingly preferred in selected cases.

c. Thrombus aspiration. Improved reperfusion has been reported when thrombus is aspirated before angioplasty,[8] though published results of ongoing benefit have been variable. This technique is likely to be employed on a case by case basis, depending on anatomic findings. Because this will delay the actual balloon inflation, the term "door-to-device" has been suggested in place of "door-to-balloon" to more accurately reflect the time to arterial recanalization.

Summary

Since implementing a protocol for the management of patients with acute STEMI, there has been a largely successful maintenance of D2B time within the 90 minute ACC/AHA guideline, with the median recently mostly under 60 minutes. Hospital mortality has been 4.0%, well below national levels. The ability of ambulance personnel to transmit high quality EKGs, prior to hospital arrival has enhanced the process. Further improvement in outcomes is anticipated with evolving cathlab techniques, including the increasing use of the trans-radial approach, of bivalirudin in place of heparin with a glycoprotein IIb/IIIa inhibitor, and in selected cases, of thrombectomy, and the use of newer platelet inhibitors.

Disclosure Statement

None of the authors identify any conflict of interest relating to this report.

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Inflammatory Bowel Disease Treatment and Non-melanoma Skin Cancer: A Case Report

Jacqueline F. De Luca MD; Yun Sun Lee MD; and Douglas Johnson MD

Abstract

Immunosuppressant medications for Inflammatory Bowel Disease can help with both symptoms and disease progression. However, like immunosuppressants used in transplant patients, they are now suspect of contributing to nonmelenoma skin cancer (NMSC). Presented is a case of a 57-year-old Jewish man with Crohn's Disease who was diagnosed with a total of 84 NMSCs. We hope to elucidate the risk of immunosuppressants, particularly the thiopurines, on the development of NMSC.

Keywords

Crohn's Disease, Ulcerative Colitis, Inflammatory Bowel Disease, Thiopurines, Nonmelanoma Skin Cancer

Introduction

Frequent exposure to UVR, fair skin, and reduced immunity are some of the major risk factors for developing nonmelanoma skin cancer (NMSC).[1] While immunosuppressants used in treating patients with inflammatory bowel disease (IBD) have been proven to control symptoms and disease progression, they are also suspected of contributing to iatrogenic NMSC. The association between NMSC and immunosuppressant use has long been documented within transplant patient populations, yet little has been published about patients with IBD until recently. In 2010, Long et al. studied a retrospective cohort with over 50,000 participants with IBD and examined the association between IBD and the development of NMSC. It also included nested case-controls to investigate specific medications that put patients at higher risk for developing NMSC. The incidence of NMSC was significantly higher among patients with IBD compared with controls (IRR, 1.64) and patients with long-term use of thiopurines appeared to be at the highest risk of developing NMSC, followed by anti-TNF medications.[2]

Case Presentation

A 57-year-old Jewish man with Crohn's disease (CD) of the ileum diagnosed at the age of thirteen, presented with multiple nonmelanoma skin cancers (NMSCs); these had developed over the past 16 years coinciding with the initiation of a prolonged course of the thiopurine 6-mercaptopurine (mercaptopurine, 6-MP). He was diagnosed with a total of 84 NMSC: 72 NMSC at our clinic, 12 from other clinics. He was also awaiting biopsy and removal for additional lesions. His CD was initially treated with sulfasalazine and intermittent steroids at diagnosis, but for the past 20 years he had been taking 6-MP daily. In the first ten years after beginning 6-MP he developed 30 NMSC; 14 were squamous cell carcinoma (SCC) and 16 were basal cell carcinoma (BCC). The patient was then treated elsewhere for the subsequent ten years. This past year, however, he returned to the clinic with over 100 new lesions suggestive of malignancy on his torso and extremities. Subsequent to this exam, he had 42 biopsy-proven lesions of NMCS; 20 were SCC and 22 were BCC. In addition, three of the SCCs were moderately differentiated and two were poorly differentiated and some of his larger skin cancers have necessitated Mohs surgery and xenografting. The largest of his lesions was pretibial and measured 64x53 mm (Figure 1). He was awaiting biopsy for many other suspicious lesions.

The patient had Fitzpatrick II skin type and admitted to excessive sun exposure for 25 years in Hawai'i. Early on he did not use sunscreen, and would sail a catamaran during peak sun hours. He also revealed that his mother had one skin cancer lesion removed and denied ever having been a smoker.

Within the past year he discontinued 6-MP and began using mesalamine (Pentasa) and later adalimumab (Humira) hoping to attenuate the progression of NMSC, and continued to have monthly skin exams. Overall, he was hospitalized 16 times for his CD, but never required any intestinal resection. Unfortunately, in his most recent hospitalization he was diagnosed with metastatic adenocarcinoma of the small bowel, and passed away shortly after.

Discussion

Our patient was treated with the thiopurine 6-MP for over 20 years, and was extensively affected with NMSC, necessitating numerous surgeries. In Long's study, persistent thiopurine use, defined as exceeding 365 days, was associated with more than a four-fold increase in risk for developing NMSC.[2] Although the mortality from skin cancer in IBD patients is unknown thus far, it could very well follow the trends seen in transplant patients. More importantly, prolonged 6-MP is considered a significant risk factor for small bowel cancer for patients with CD (OR 10.8, CI 1.1-108.7).[3] Our patient's prolonged course of 6-MP may be implicated in his premature death from metastatic adenocarcinoma of the small bowel. Further studies documenting longer-term exposure to immunosuppressives, in particular, the thiopurines, would be extremely beneficial for our understanding of the risks these medications pose.

Disclosure

The authors have no affiliation with or significant financial involvement in any organizations or entity with a direct financial interest in the subject matter or materials discussed in this manuscript. This includes employment, honoraria, consultancies, or relevant stock ownership.

Figure 1. Left Lower Leg

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Morbidity and Mortality in People with Severe and Persistent Mental Illness in Hawai'i

William P. Sheehan MD

"People with serious mental illness (SMI) die, on average, 25 years earlier than the general population."[1] That's the attention-grabbing first sentence of a report entitled "Morbidity and Mortality in People with Serious Mental Illness," published in October 2006 by the National Association of State Mental Health Program Directors (NASMHPD) Medical Directors Council. It is one of the largest health disparities in the country. The report received national attention.

An earlier study showing this large health disparity had been published by the Center for Mental Health Services of the Substance Abuse and Mental Health Services Administration (SAMHSA),[2] and was based on mortality data reported by 16 states from 1997-2000. As an example, for the year 2000, the Years of Potential Life Lost reported in 4 of those states (Arizona, Missouri, Rhode Island, and Virginia) averaged 24.5 years. Additional studies in other states, including Massachusetts, Ohio, and Maine confirmed similar findings.[1] As the average life expectancy in the United States in the year 2000 was 77 years, and people with severe mental illness were dying on average at about age 52, the disparity was significant.

These findings were so noteworthy that the popular literature picked up the story, with articles appearing in *USA Today*[3] and *Time Magazine*.[4]

After the report was released, the State of Hawai'i Department of Health (DOH), Adult Mental Health Division (AMHD), conducted an internal study to compare the mortality data of Hawai'i's population of individuals with severe mental illness who were receiving services from AMHD to the national data published by NASMHPD. The AMHD Performance Improvement Office and the Quality Review Committee examined data reported to AMHD about the deaths of consumers receiving services in Fiscal Year 2006 (FY 2006), covering the period from July 1, 2005 to June 30, 2006.[5] The goal was to identify any patterns, opportunities for improvement, and opportunities for improved collaboration with medical providers.

During FY 2006, there were 103 deaths reported among the 12,569 individuals served by AMHD. Hawai'i's population was 1,275,194, and there were 9,330 deaths reported for the state. The average age of death for the 103 AMHD consumers who died that year was 52.8 years. That year, according to Health Trends in Hawai'i,[6] the average life expectancy in Hawai'i was 80 years. For Hawai'i, the average Years of Potential Life Lost (YPLL) in FY 2006 was 27.2 years, slightly higher than the national average (the calculation of YPLL is the sum of (life expectancy – age at death) of those who died, divided by the number of deceased individuals). Additionally, the number of deaths per 1,000 population in Hawai'i for FY 2006 was obtained from the Department of Health Office of Health Statistics Monitoring (OHSM), and compared to the number of deaths per 1,000 population of consumers served by AMHD, to give a death rate by age. The ages of each death in Hawai'i for FY 2006 was not obtained, but the number of deaths for 4 adult age groups was available (age groups 18-34, 35-44, 45-64, and >65); see Table 1. The death rates for each of the age groups among adults in Hawai'i compared to those of AMHD consumers shows a significantly increased death rate for each age group in the AMHD population.

In FY 2006, AMHD was able to obtain the death certificate or autopsy results for 40 of the 103 individuals receiving services who died that year. In cases in which autopsy results or a death certificate were not available, the underlying cause of death was classified by AMHD Performance Improvement Office based on the report submitted by the provider of services to the consumer. The causes of death for the 40 consumers for whom AMHD received information are shown in Table 2.

Of the 21 Medical Deaths for which AMHD was able to obtain autopsy results or a death certificate, cardiovascular disease was identified as the cause in 76% of the cases (Table 3).

According to the Centers for Disease Control,[7] Cardiovascular Disease is the cause of approximately 25% of the deaths in the United States. The AMHD data shows that cardiovascular disease or cardiac arrest was the cause of 40% (16 of 40) of AMHD consumer deaths in which an autopsy or death certificate was received. This rate is 60% higher rate than the national average.

There is no simple resolution to this disparity. As in much of behavioral health, multiple factors are involved. The NASMHPD Morbidity and Mortality report stated, after factoring out the role of suicide in decreased life expectancy, "people with serious mental disorders are dying from similar causes as found in the general population and their standardized mortality rates are higher than those of the general public".

These increased death rates among those with severe mental illness are thought to be associated with general modifiable risk factors as well as some that are specifically associated with psychiatric conditions. The general modifiable factors associated with a higher rate of death in consumers with severe mental illness include:

Table 1. AMHD Deaths per 1,000 by Age Group (Source: DOH OHSM Vital Statistics & AMHD Performance Improvement Office data on file)

Age group	Hawai'i OHSM Vital Statistics			AMHD		
	Hawai'i Deaths	Hawai'i 2000 census population	Hawai'i Deaths / 1000 population	AMHD Deaths	AMHD consumer population	AMHD Deaths / 1000 population
18 to 34	209	254,568	.82	11	2,513	4.38
35-44	299	191,177	1.56	14	2,610	5.36
45-64	1767	277,940	6.36	58	4,134	14.03
>65	2437	160,601	15.17	20	878	22.78

Table 2. Cause of Death, AMHD, FY 2006 (Source: AMHD Performance Improvement Office data on file)

Cause of Death	Autopsy/Death Certificate Received	Autopsy/Death Certificate not Received	Total
	N	N	
Accidental Death	7	6	13
Medical Death	21	41	62
Suicide	5	4	9
Unknown Cause	7	12	19
Totals	40	63	103

Table 3. Medical Causes of Death, AMHD, FY 2006, per autopsy or death certificate received (Source: AMHD Performance Improvement Office data on file)

Cause of Death	Number of Deaths	Percentage of deaths in AMHD population due to medical causes
Cardiovascular Disease/Cardiac Arrest	16	76%
Pulmonary Disease	1	5%
Carcinoma	1	5%
Infectious Disease	1	5%
Alcohol Dependence	1	5%
Undetermined	1	5%

- Smoking
- Alcohol and drug use
- Poor nutrition and obesity
- Lack of exercise
- Unsafe sexual practices
- Homelessness
- Poverty/unemployment
- Victimization/trauma
- Incarceration
- Lack of access to medical and social services

The increased risk factors more specifically associated with mental illness include:

- Impaired reality testing
- Disorganized thought processes
- Paranoia
- Impaired communication skills
- Impulsive behavior

The significance of the phenomenon of increased mortality of individuals with severe mental illness is intuitive as well as supported by data. Our public health challenge is to make a meaningful impact on the problem! DOH and AMHD have implemented a number of initiatives and programs designed to improve the quality and quantity of life for those we serve.

Director of Health Loretta J. Fuddy has created a Department of Health Strategic Plan, FY 2011-2014,[8] which includes "The Five Foundations for Healthy Generations," serving as guiding principles at the DOH for planning and providing services for a healthier Hawai'i. The Foundations include:

Foundation 1: Health Equity
- Goal: "Eliminate disparities and improve the health of all groups throughout Hawai'i"
- Objective 1-1: "Ensure integration of behavioral health with primary care."

Foundation 2: Health Promotion and Disease Prevention
- Goal: "Attain lifelong quality health free from preventable disease, avoidable disability, and premature death"
- Objective 2-2: "Increase promotion of healthy choices and behaviors."

With the Foundations for Healthy Generations, the DOH has established as a priority the coordination of planning and programs to achieve the long term goal of eliminating disparities and improving the health of all groups in Hawai'i.

DOH has applied for a grant from the Substance Abuse and Mental Health Services Administration (SAMHSA), called the Primary Behavioral Health Care Integration Grant, the main objective of which is to develop and implement a health home within state operated Community Mental Health Centers (CMHCs). These health homes will provide integrated primary care and behavioral health services to adults with severe and persistent mental illness. The grant proposal is for primary care providers to be deployed into a CMHC to create a health home in the same place where consumers receive their mental health services.

The AMHD CMHC system, which is comprised of a statewide network of centers providing outpatient services to those with severe and persistent mental illness, offers many programs to improve wellness and decrease morbidity. CMHC patients are routinely monitored for height, weight, Body Mass Index, blood sugar and cholesterol levels, blood pressure, heart rate, and lifestyle habits. Health services provided through the centers include smoking cessation programs, nutrition and exercise counseling, and wellness programs. Case managers and nursing staff at the CMHCs provide liaison services with primary care providers. At the rehabilitation programs provided at the CMHCs, known as Clubhouses, wellness supports and services (including exercise classes, healthy meal planning, and health education) were provided to 631 consumers in 2011. Smoking cessation programs are now being implemented.

The Hawai'i State Hospital (HSH) has a Medical Services Unit which is staffed by two full time internists and one advanced practice registered nurse. Patients at the HSH receive primary and specialty care services, along with immunizations, vaccinations, tuberculosis testing, nutritional counseling, exercise programs, and screening and monitoring for common medical conditions. Prior to discharge, each patient receives referral and linkage to both physical and mental health providers through collaboration with the patient's health plans and community providers.

In addition to the State's efforts, every health care professional in Hawai'i may participate in reaching the public health goal of eliminating the disparity in life span for those with severe mental illness. The 2006 NASMHPD report described a number of recommendations for community providers. They include:

- Adopt as a practice policy that mental health and physical healthcare should be integrated.
- Implement care coordination between mental health and physical health providers.
- Help consumers of healthcare services understand that improved health is possible, so as to enable their engagement as partners in care and treatment.
- Support wellness and empowerment in persons served, to improve health choices and mental and physical well-being.
- Ensure the provision of quality, evidence-based physical and mental health care.
- Ask about smoking status and offer smoking cessation counseling.
- Implement standards of care for prevention, screening and treatment of lifestyle related conditions.

The significant decrease in the life expectancy of those individuals in Hawai'i who have severe and persistent mental illness compared to the general population is striking. It is consistent with the trend in the rest of the country. The causes of this disparity are significantly related modifiable lifestyle factors. The systems, providers, and consumers of healthcare services, working together, can make a significant impact to improve this disparity. Abraham Lincoln said, "... in the end it is not the years in your life that count; it's the life in your years." With our commitment to include health and wellbeing as an integral part of every level of health care, both the quantity and quality of life can be improved for our consumers.

Conflict of Interest

The author reports no conflict of interest.

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The Department of Native Hawaiian Health at the John A. Burns School of Medicine

Joseph Keaweʻaimoku Kaholokula PhD; Winona Lee MD; Marjorie K. Mau MD, MS; Mele Look MBA; Dee-Ann Carpenter MD; Mililani Trask-Batti BA; and Lauleipuaokalani Coen BS

The Department of Native Hawaiian Health (NHH) is one of 11 clinical departments in the University of Hawai'i's John A. Burns School of Medicine (JABSOM). The department's mission is to be a center of excellence in education, research, and quality healthcare practices, committed to the optimal health and wellness of Kānaka ʻŌiwi (Native Hawaiians), their families and communities, while embracing traditional Hawaiian values and practices. NHH, as an academic and medical field of study, embraces a multi-disciplinary approach in addressing the health disparities experienced by Kānaka ʻŌiwi (and other health disparate groups) that integrates the biomedical, behavioral, psychosocial, and public health sciences with Hawaiian cultural knowledge and wisdom. It applies these sciences and Hawaiian cultural knowledge to medical education, basic and clinical research, clinical services and training, and community-engagement.

Moʻolelo: A Brief History of the Department of Native Hawaiian Health

Under Dean Ed Cadman, Dean of JABSOM (1999 to 2005), NHH was first established as a JABSOM program in 2002. In 2003, the University of Hawai'i (UH) Board of Regents' established NHH as a clinical department in JABSOM. To help build NHH, the Queen's Health Systems (QHS) made an initial investment of $5 million to support its establishment and mission to address the health of Kānaka ʻŌiwi. Two preexisting JABSOM programs, 'Imi Hoʻōla: Post-Baccalaureate Program and the Native Hawaiian Center of Excellence under the respective leadership of Dr. Nanette Judd and Dr. Ben Young, became part of the newly formed NHH's medical education activities. Dr. Marjorie Mau was appointed the founding Chair of NHH. Under her leadership, the department grew to become the only clinical department in a US medical school dedicated to the health and well-being of an indigenous population. Currently, NHH is comprised of four divisions (Medical Education, Research, Clinical Teaching and Services, and Community-Engagement) supported by an administrative core that includes an office of human resource, grants management, and program development.

Hoʻonaʻauʻao: Creating Diversity in the Health Profession Workforce

Comprising the NHH Medical Education Division are the Native Hawaiian Center of Excellence (NHCOE) and the 'Imi Hoʻōla Post-Baccalaureate Program. Its shared mission is to build diversity in JABSOM and the medical profession in Hawai'i. Under the former leadership of Drs. Benjamin Young and Nanette Judd and the current director, Dr. Winona Lee, NHCOE and 'Imi Hoʻōla have become essential "pipelines" to the health professions for students from under-represented and disadvantaged backgrounds and to academic medicine for post-doctoral physicians and researchers.

The 'Imi Hoʻōla ("Those Who Seek to Heal") Post-Baccalaureate Program has a proven track record of producing physicians from diverse social backgrounds who have a commitment to providing medical care in underserved areas of Hawai'i and the Pacific.[1,2] Annually, 'Imi Hoʻōla offers educational opportunities for up to 12 students from economically, socially, and/or educationally disadvantaged backgrounds who demonstrate the potential to pursue a career in medicine but have experienced challenges that hinder this process. The intensive one-year program integrates concepts in the sciences and humanities to strengthen the students' basic science and clinical skills. In addition, the program develops their communication, critical thinking, professionalism, and learning skills. Upon successful completion of the one-year program, students enter JABSOM as first-year medical students. Of the 226 graduates of the program, 85% have gone on to provide primary care health services and 96% take care of underserved and/or disadvantaged populations. Forty (40%) of the graduates are of Native Hawaiian ancestry. The majority of graduates originate from rural and or underserved populations with a desire to return to their home community to practice medicine.

The NHCOE provides education and training enhancement programs to Native Hawaiian students and those at the post-doctoral stage of their career (http://www.hawaii.edu/nhcoe/). The purpose of NHCOE is to improve the healthcare workforce in the State of Hawai'i and to increase diversity in JABSOM faculty and students through the provision of education, research, and community partnership opportunities. Led by Dr. Martina Kamaka, NHCOE offers cultural competency training to JABSOM faculty, community health care providers, and all first and second year JABSOM medical students. NHCOE also offers post-doctoral medical education and research fellowships to qualified individuals possessing an MD or PhD in a health-related field. In collaboration with the UH School of Social Work, Kīpuka Native Hawaiian Student Center at the UH at Hilo, and the Office of Student Equity, Excellence and Diversity (SEED), NHCOE has reached over 2,500 middle school, high school, and college students throughout the state. It exposes them to opportunities in the health careers, and

has worked directly with 37 Native Hawaiian undergraduates through its Native Hawaiian Student Pathways to Medicine, enter medical school.

Hōʻike: Eliminating Health Disparities in Hawaiʻi through Research

Included in the NHH Research Division is the Center for Native and Pacific Health Disparities Research (the Center) which houses several research projects. In addition to the Center, highlighted are two of its projects, the Mālama Puʻuwai Project (MPP) under the leadership of Dr. Marjorie Mau and the PILI ʻOhana Project (POP) directed by Dr. Keaweʻaimoku Kaholokula. The Center and POP are funded by the National Institute on Minority Health and Health Disparities (NIMHD) and the MPP is funded by the National Heart, Lung, and Blood Institute (NHLBI) both under the National Institutes of Health (NIH). A health disparity is known to exist "…when a particular population has significantly higher rates of disease incidence, prevalence, morbidity, or mortality than the general population" (US Public Law 106-525).

For 10 years, the Center for Native and Pacific Health Disparities Research has served as a regional focal point for research designed to eliminate health disparities and improve health outcomes for populations in the Pacific region including Native (eg, Native Hawaiians and Alaska Natives) and Pacific Peoples (eg, Pacific Islanders and Filipinos; http://www3.jabsom.hawaii.edu/native/index.htm).[3] The Center's scientific theme is cardiometabolic health disparities, which includes heart disease, diabetes, obesity and metabolic syndrome and their risk factors, and partners with other JABSOM basic science (eg, Cell and Molecular Biology) and clinical (eg, Pediatrics and Medicine) departments and scientists, Office of Public Health Sciences, and other Native and Pacific serving organizations throughout Hawaiʻi and the Pacific Rim. A range of basic and clinical studies are conducted to elucidate the biological, behavioral, and psychosocial mechanisms that influence cardiometabolic health and to test novel interventions in combating obesity, diabetes, and heart disease. In addition to conducting research, the Center assists to strengthen the capacity of community organizations and scientists in pursuing research and clinical services that benefit Native Hawaiians and Pacific Peoples through annual research and grant writing workshops and He Huliau, a national health disparities conference.

The MPP is a multi-program project that has completed a randomized control trial, the Mālama Puʻuwai Study, which tested an educational program aimed at preventing adverse health outcomes in Native Hawaiian and Pacific Islander patients with cardiomyopathy. The MPP is now in its dissemination phase, an adapted version of the Mālama Puʻuwai Program, entitled Hoʻomau ka Puʻuwai (Maintaining the Heart), is being disseminated into clinical practice at Queen's Medical Center (QMC) and 4 community clinical centers. This activity is in collaboration with Diane Paloma, Director of the Native Hawaiian Health Program at QMC. The work of MPP has led to funding from the Office of Hawaiian Affairs (OHA) to work with the Hāna community on Maui to learn more about heart disease and cardiomyopathy including inheritable forms of heart disease. Dr. Todd Seto of QMC is directing the OHA-support project.

The PILI ʻOhana Project (POP) is a community-academic partnership to eliminate obesity and related disparities through the development of effective and sustainable community-based and community-led health promotion programs for Native Hawaiian and Pacific Islander communities (http://www2.jabsom.hawaii.edu/pili). The community-based organizations involved are (1) Hawaiʻi Maoli of the Association of Hawaiian Civic Clubs, (2) Kula no nā Poʻe Hawaiʻi of the Papakōlea, Kewalo, and Kalāwahine Hawaiian Homestead communities, (3) Ke Ola Mamo, the Native Hawaiian Health Care System for the island of Oʻahu, and (4) Kōkua Kalihi Valley Comprehensive Family Services.[4]

Along with NHH scientists, the POP partnership has developed and tested several versions of a lifestyle intervention (The PILI Lifestyle Program) and a diabetes self-management program (Partners in Care) over the past 8 years that uses a Community-Based Participatory Research (CBPR) approach.[5-8] Currently, the POP partnership is working with other community-based organizations that serve Native Hawaiians and Pacific Islanders to disseminate and implement these interventions.

Hoʻōla: Improving Healthcare in Hawaiʻi

To meet the quality healthcare practices mission of NHH, the Lau Ola Healthcare System (referred to as Lau Ola) was formed through JABSOM's faculty practice plan known as UCERA (the acronym for the University Clinical, Education, & Research Associates). A team of primary care, behavioral health, and other providers of Lau Ola work toward improving the clinical outcomes of Native Hawaiians and other health disparate groups while developing innovative models of care to meet the needs of these communities. Following are some of the healthcare services and trainings being provided by providers of Lau Ola.

Dr. Kalani Brady and his team of physicians, Drs. Peter Donnolly, Martina Kamaka and Chad Koyanagi, care for the Hansen's disease patients of Kalaupapa on Molokaʻi as well as in Hale Mōhalu on Oʻahu. At the Lau Ola Clinic on Oʻahu, Drs. Kalani Brady and Dee-Ann Carpenter provide culturally-appropriate primary care services. Dr. Chad Koyanagi is available for psychiatric services, and Dr. Amy Wassman administers behavioral health services. In collaboration with the UH School of Pharmacy, Dr. Candace Tan, a clinical pharmacist, has joined the healthcare team.

Lau Ola Clinic is also a training site for clinical teaching of JABSOM medical students and Internal Medicine residents, such as Dr. Marcus Iwane (a 3rd third year resident). Additionally, the providers, staff, and students provide regular health care screenings and counseling at the Papakōlea Hawaiian Homestead Community Center and other venues, such as at the ʻAha Kāne an ʻAha Wāhine conferences and the annual cultural gathering at Puʻukoholā Heiau on Hawaiʻi island.

Laulima: Engaging Community Partnerships to Translate Science into Practice

The Community Engagement Division of NHH, directed by Ms. Mele Look, MBA enables and nurtures multiple community partnerships through an extensive 32-member community coalition called the Ulu Network. The membership includes 14 federally qualified community health centers (CHC) in Hawai'i, five federally established Native Hawaiian Health Care Systems (NHHCS), two partners in California, and several rural community hospitals, and Hawaiian Civic Clubs that serve Native Hawaiians and other Pacific Peoples. Of the 32 members, 11 have been involved in 12 NIH-funded studies and 13 organizations have collaborated on 18 health information dissemination programs. A particularly effective program has been the Land, Food, and Health initiative that combines diabetes self-management classes and activities that reconnect patients with the Pacific concepts of land and health.

A priority of the Division has been trainings for community health workers to build clinical and research capacity and support community-based health promotion activities. The division has conducted 42 caridometabolic health training seminars targeting outreach and community health workers, reaching 607 attendees. The culturally relevant seminars were led by multi-disciplinary instructors and taught across Hawai'i and on the continental US. The Division plays a vital role in ensuring community participation across all other NHH Divisions.

Ka Wā Mahope: Looking Toward the Future

NHH continues to broaden its scope of activities in ho'ona'au'ao (teaching), hō'ike (discovering), and ho'ōla (healing) to realize its vision of a vibrant, robust, and healthy Kānaka 'Ōiwi population. As NHH celebrates a decade of working toward this vision, the faculty and staff extends a mahalo (thank you) to its academic and community partners for allowing us to work together, in the spirit of laulima (cooperation), to achieve our shared visions of a healthier Hawai'i.

Conflict of Interest

The authors report no conflict of interest.

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January 2013				
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THE WEATHERVANE

RUSSELL T. STODD MD; CONTRIBUTING EDITOR

Russell T. Stodd MD

HOLY VENIPUNCTURE! THIS STUPID PLAN INCLUDED 30% TO 40% OF ALL THE CHILDREN IN AMERICA.

Last year the National Heart, Lung and Blood Institute (NHLBI) panel recommended universal screening of 9 to 11 year-old children for non-fasting lipid blood levels. Included in the plan was screening with 2 fasting lipid profiles of children ages 2 to 8 years and 12 to 16 years. The NHLBI even got the American Academy of Pediatrics to go along with this absurd plan. Thankfully, critics from the University of California, San Francisco, argued that the panel provided no estimates of the health benefits, harms, and costs that might result from such screening. Moreover, they expressed concerns about conflicts of interest with industry that could have affected their "expert" judgment. The NHLBI responded that the suggestion is justified to help identify children with familial hypercholesterolemia which affects about one in 500. Perhaps something useful could be found for the NHLBI to address.

THE IRONMAN WORLD CHAMPIONSHIP JUST LOST ITS TOP BILLING.

Lance Armstrong, the superlative biking champion, has been under repeated attacks for years from many sources. They all claim he is guilty of using performance enhancing drugs and/or blood doping. He declared that he has never done so, and has not been found positive on any test at any time. He said he is ready for any test at any hour day or night without warning. He is a survivor of testicular cancer. Still, the US Anti-doping Agency (USADA) has declared Armstrong ineligible for competition, in particular the Triathlon held annually in Kona, Hawai'i. They stripped him of his titles and his seven victories in the Tour De France. Armstrong will not submit to arbitration with the USADA, but this is not an admission of any guilt. He has confronted so many allegations through the years that it has become a game of "whack-a-mole." Now at age forty, it appears he has simply grown fatigued and been ground down. "Enough is enough. This has been a witch-hunt for years. We've got to stop this. For my mental health, for my family and for the sport of cycling." A federal judge wrote last week, "USADA's conduct raises serious questions about whether its real interest in charging Armstrong is to combat doping or is it acting according to less noble motives."

CONFESSION IS GOOD FOR THE SOUL EVEN 80 YEARS AFTER THE CRIMES.

In 1933, Adolph Hitler and the Nazi party took over the government in Germany. The Nazi regime had high regard for physicians and provided economic incentives to those who joined the party. Physicians enrolled at a higher rate than any other profession. Jewish people were excluded. All practice in Germany fell under the financial and political control of the Nazis. By rationalizing that they were serving the state, physicians performed sterilization, euthanasia, ghastly experiments and ultimately genocide of Jewish, Gypsy, black, homosexual and other "genetically inferior" individuals. The Nuremberg Doctors Trial of 1946-47 revealed that medical schools, organized medicine and scores of ordinary physicians were involved. Of the 23 defendants at the Doctors Trial, 7were acquitted, 7 received death sentences and the remainder were sentenced from 10 years to life in prison. At last, in May 2012, for the first time, the German Medical Assembly at the 115th annual meeting, admitted that the war crimes involved much more than the handful taken to trial. "We acknowledge the substantial responsibility of doctors for the medical crimes committed under the Nazi regime and regard these events as a warning for the present and the future."

ABOUT HALF OF ALL AMERICANS SUFFER CRUEL AND UNUSUAL PUNISHMENT. THEY HAVE TESTICLES.

The biggest insults to our native intelligence seem to emanate from our judicial system. If you doubt that statement, consider the ruling of US District Judge Mark Wolf in Massachusetts. A man is serving a life sentence without possibility of parole for murdering his wife in 1990. The state Department of Correction prescribed sex-reassignment surgery for Michelle (nee Robert) as "the only form of adequate medical care." The Judge ruled that denying the surgery was a violation of the Eighth Amendment's prohibition on cruel and unusual punishment. Dig deep into your pocket, tax-payers. It is transgender time, and we must remove this poor suffering girl's gonads.

"WE HAVE TO PASS THIS BILL SO WE CAN FIND OUT WHAT IS IN IT." N. PELOSI

Christine K. Cassel MD writing in the Journal of the American Medical Association, asks the question, "Does Measurement Suppress Motivation?" The query is especially significant coming from Dr. Cassel because she is part of the intellectual foundation for the measured-directives movement. Obama care provides for the physician to comply with the law's new Physician Quality Reporting System (PQRS) buried in the Centers for Medicare and Medicaid. In the words of PQRS, "The program provides an incentive payment to practices with eligible professionals identified by their individual National Provider Identifier (NPI) and Tax Identification Number (TIN) who satisfactorily report data on quality measures for covered Physician Fee Schedule (PFS) services furnished to Medicare Part B Fee-for-Service (FFS)." If a physician actually manages to comply with this labyrinthine drivel, Medicare might give him/her half the normal fee. Hooray for Obama care! Not!

IN ONE ERA AND OUT THE OTHER.

Previous population studies revealed that people with elevated levels of high-density lipoprotein (HDL) have lower than average risk of heart attack. A new report in Lancet showed that merely raising levels of HDL does not protect against heart attack. Roche announced that a trial of their HDL-lifting drug was stopped because it was not effective. Large studies show a consistent pattern: people with high levels of low-density lipoprotein (LDL) are more vulnerable to having a heart attack. That information has been backed up by drug studies, showing a drop in LDL lowers cardiac risk. The opposite expectation, boosting HDL, does not help. The current data suggest that serum HDL level may serve as an indicator of some other biological process that protects the heart.

SHE ACTUALLY SAID HELL INSTEAD OF HECK? OH, DEAR ME!

Kaitlin Nootbaar was named valedictorian of her high school graduating class in Prague, Oklahoma. In her speech when asked about career plans, she replied, "How the hell do I know? I've changed my mind so many times." The school principal refused to award her diploma saying. "Your diploma is right here, and you're not getting it." He demanded a written apology for saying hell rather than heck. She refused. Meanwhile she has started classes at Southwest Oklahoma State University on a full scholarship.

ADDENDA

- A blink of the eye takes 0.3 seconds.
- There are 350 sheep for every human being on the Falkland Islands.
- Playboy magazine data reports that 15% of people would rather give up sex for a weekend than spend it without their phone.
- I love the smells at the baseball park, the leather, the pine tar, the resin — and that's just the hot dogs.
- Wine — cheaper than Botox and paralyzes more muscles.
- A new retirement home is so posh the walkers have air bags.

ALOHA AND KEEP THE FAITH rts

(Editorial comment is strictly that of the writer.)