

Colonoscopy Screening among Native Hawaiians at Queen's Medical Center between August 2011 and January 2013

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Abstract

A retrospective chart review in the Endoscopy Department at Queen's Medical Center identified 358 Native Hawaiian patients who had completed a colonoscopy screening procedure between August 2011 and January 2013, through either the Direct Referral Colonoscopy program or its Traditional Referral program. The differences in the characteristics of Native Hawaiian patients were summarized and compared between the two referral programs to identify potential barriers for future interventions and increase colorectal cancer screening. The combined colonoscopy screening rate among Native Hawaiians was 13%. Younger patients and those with private insurance were found to be undergoing colonoscopy screening through the Direct Referral program. The findings of this study underscore the need to reduce disparities in colonoscopy screening among Native Hawaiians.

Keywords

Colonoscopy, Colorectal Cancer Screening, Direct Referral program, Traditional Referral program, Native Hawaiians

Introduction

Colorectal cancer (CRC) is the third leading cause of cancer death in both men and women in the United States (US), with approximately 5% of the population affected.¹ In 2015, there were an estimated 132,700 new cases of CRC and 49,700 deaths in the US.² In Hawai'i, approximately 12 percent of annual cancer incidence and 10 percent of cancer mortality is attributed to colorectal cancer, which is the second leading cause of cancer death in the state.³ Although mortality rates associated with CRC have declined over the past 30 years among most racial/ethnic groups in Hawai'i due to increased screening and improvements in treatment, similar gains have not been observed for Native Hawaiians.^{3,4} Studies report poor survival and unchanged life expectancy for Native Hawaiian CRC patients with a majority diagnosed at advanced stages.⁴⁻⁶ Native Hawaiian men show an increased risk for CRC and higher mortality rates than Native Hawaiian women.^{3,7,8}

The United States Preventive Services Task Force (USPSTF) recommends persons aged 50-75 years with an average risk for CRC to be screened by the following different modalities: fecal occult blood testing (FOBT) every year, or sigmoidoscopy every 5 years with FOBT every 3 years, or colonoscopy every 10 years.⁹ Several studies have shown colonoscopy to be a very effective method for reducing colorectal cancer mortality.¹⁰⁻¹⁵ The popularity of colonoscopy is reflected in the Behavioral Risk Factor Surveillance System (BRFSS) survey which indicated that the most commonly used CRC screening test was colonoscopy, with 61.7% of all respondents in the US.¹⁶ In 2013, an estimated 66.4% of adults in Hawai'i reported being up-to-date with CRC screening, an increase from 61.1% in 2012. Of those individuals, the ethnicity with the highest completion rate was

Japanese (74.2%), followed by Chinese (70.7%), Caucasians (68.6%), Native Hawaiians (62.8%) and Filipinos (52.8%).¹⁷

CRC screening rates have increased significantly in the US. However, low screening rates are consistently seen among minority populations,¹⁸⁻²⁴ particularly among Hispanics and African Americans.²⁵⁻³¹ Native Hawaiians have also been found to have low screening rates.³² Prior studies conducted on Native Hawaiians with CRC mainly focused on assessment of risk factors, incidence and mortality rates, cancer staging, cancer survival and public health perspectives of CRC screening.^{4-8,22} Only a couple of studies have been conducted on targeted interventions among Native Hawaiians.^{33,34}

Traditionally, in order for a patient to be screened, a primary care provider must refer the patient to a gastroenterologist who sees the patient in their outpatient clinic. The clinic staff then preauthorizes the procedure with the patient's insurer, schedules the colonoscopy, and reviews the preparation instructions with the patient. In 2011, a Direct Referral Colonoscopy (DRC) program was developed by Queen's Medical Center in Honolulu, Hawai'i to facilitate and streamline screening colonoscopy procedures. The DRC program allows primary care providers (PCP) a means to directly refer a patient for colonoscopy without a pre-consultation office visit with a gastroenterologist. In the DRC program, Gastroenterology (GI) nurses receive the colonoscopy referrals and then carry out pre-authorization of the colonoscopy, patient education (on the procedure and preparation), and scheduling. The intent of the DRC program is to increase screening colonoscopy rates through ease of use for PCPs, who often wait several weeks for new GI clinic appointments, and decrease the costs by eliminating the need for a pre-colonoscopy office visit.

List of Abbreviations	
CRC	Colorectal Cancer
US	United States
USPSTF	United States Preventive Services Task Force
FOBT	Fecal Occult Blood Test
BRFSS	Behavioral Risk Factor Surveillance System
DRC	Direct Referral Colonoscopy
PCP	Primary Care Providers
GI	Gastroenterology
RN	Registered Nurse
ICD	International Classification of Diseases
TRC	Traditional Referral Colonoscopy
N.H.	Native Hawaiian

The purpose of this study was to investigate differences in the characteristics of Native Hawaiian patients who completed direct versus traditional referral colonoscopy (TRC) screening procedures. This comparison will help to identify system barriers and inform potential interventions to improve colonoscopy screening among persons in the Native Hawaiian population.

Methods

A retrospective chart review was conducted in the Endoscopy Department at Queen's Medical Center. All patients who completed a screening colonoscopy procedure between August 2011 and January 2013, either through the DRC program or the TRC program, were identified. The study was approved by Queen's Medical Center's Institutional Review Board. Since the study was a retrospective chart review, informed consent from the patients and patient contact was not needed.

Queen's Medical Center developed a DRC program in the spring of 2011, with the first patients being screened in August of 2011. An eligibility checklist, based on a patient's medical history and presence of gastrointestinal symptoms, was completed by the referring physician and sent to the DRC program to be reviewed by a Registered Nurse (RN) (Table 1). Only patients with no items checked on the checklist were eligible for the DRC program, while patients with one or more items checked were referred to a GI specialist for a pre-consultation visit.

A RN contacted eligible patients to review medical history, schedule a colonoscopy procedure date, and provide education. The RN maintained communication with referring physicians to provide updates on the status of the referral and to obtain any other necessary paperwork. A RN contacted the patient 3-7

days prior to their scheduled procedure date to review bowel prep instructions and provide support and education. On the procedure day, the patient met with the gastroenterologist performing the procedure to review their medical history and sign consent.

The DRC program was first advertised to the Queen's Clinics in Hawai'i Kai and Kapolei. Shortly after the program started, DRC was advertised to PCPs and private practices located in the Queen's Physician Office Buildings, community health centers, and PCPs in private practice on O'ahu.

The inclusion criteria for the study were: (1) Native Hawaiian (self-reported), (2) age 50-75 years, (3) pre-op diagnosis of screening colonoscopy or ICD (International Classification of Diseases) 9 code V76.51. Exclusion criteria were: (1) pre-op diagnosis or indication for procedure did not indicate 'screening' or ICD-9 code V76.51 as purpose for procedure and, (2) patient received a screening colonoscopy within 10 years.

Demographic variables were collected as follows: age (50-54 years, 55-64 years and 65-75 years), gender, ethnicity (Native Hawaiians and Part-Hawaiians), marital status (single, married, and divorced/widowed/separated), and type of medical insurance (public and private). Patients were categorized based on the type of referral (direct referral or traditional referral).

Descriptive statistics were used to summarize demographic characteristics. Bivariate analysis was performed to evaluate the relationship between the demographic variables and use of colonoscopy screening procedures using Chi-square test or Fisher's exact test as appropriate, for categorical variables. Two-sided *P*-values of less than .05 were considered statistically significant. Statistical analyses were conducted using SAS version 9.3.

Table 1. Eligibility checklist for the DRC program		
Is the patient or does the patient have ...	Yes	No
Age 75 or older		
Pregnant		
Cardiac disease including Congestive Heart Failure (CHF), valvular heart disease, pacemaker/Automatic implantable cardioverter-defibrillator (AICD)		
On anti-platelet or anticoagulation medication (including over-the-counter medication such as aspirin) and cannot safely stop prior to procedure		
Severe lung disease including Chronic Obstructive Pulmonary Disease (COPD), emphysema, asthma requiring supplement oxygen		
Sleep apnea requiring Continuous Positive Airway Pressure (CPAP) machine		
Significant kidney/liver disease		
A history of difficulty with previous sedation/anesthesia		
Drug or alcohol abuse (males: >16 drinks/week, females: >10 drinks/week)		
Use of antidepressants, antipsychotic, anti-seizure, benzodiazepines, narcotics, sedatives, or sleeping pills (frequent/regular use ie, >3-4 times/week)		
Diabetes on insulin		
Morbid Obesity (Body Mass Index (BMI) >40 or BMI >35 w/co-morbidities)		
Current GI symptoms		

Note: Patients with no item checked on the checklist will be referred to the DRC program directly, while patients with one or more items checked will be referred to a GI specialist.

Results

Between August 2011 and January 2013, there were a total of 2,738 patients who had completed colonoscopy screenings at Queen's Medical Center, 592 through the DRC program and 2,146 through the TRC program. Among 592 patients screened through DRC program, 71 (12%) were Native Hawaiians, whereas 287 out of 2,146 (13%) screened through TRC program were Native Hawaiians (Figure 1). Overall, patients in the direct referral program were younger with 59% aged 50-54

years compared to 44% for the traditional referral program ($P=.002$) (Table 2). Also, 20% of patients in the traditional referral program were 65 years and above, compared to just 4% in the direct referral program. Although the majority of patients in either referral program had private insurance, the DRC program had a significantly higher proportion of privately-insured patients compared to those in the TRC program (87% vs 67%, $P<.001$). No significant differences were observed for gender ($P=.38$), ethnicity ($P=.65$), or marital status ($P=.28$).

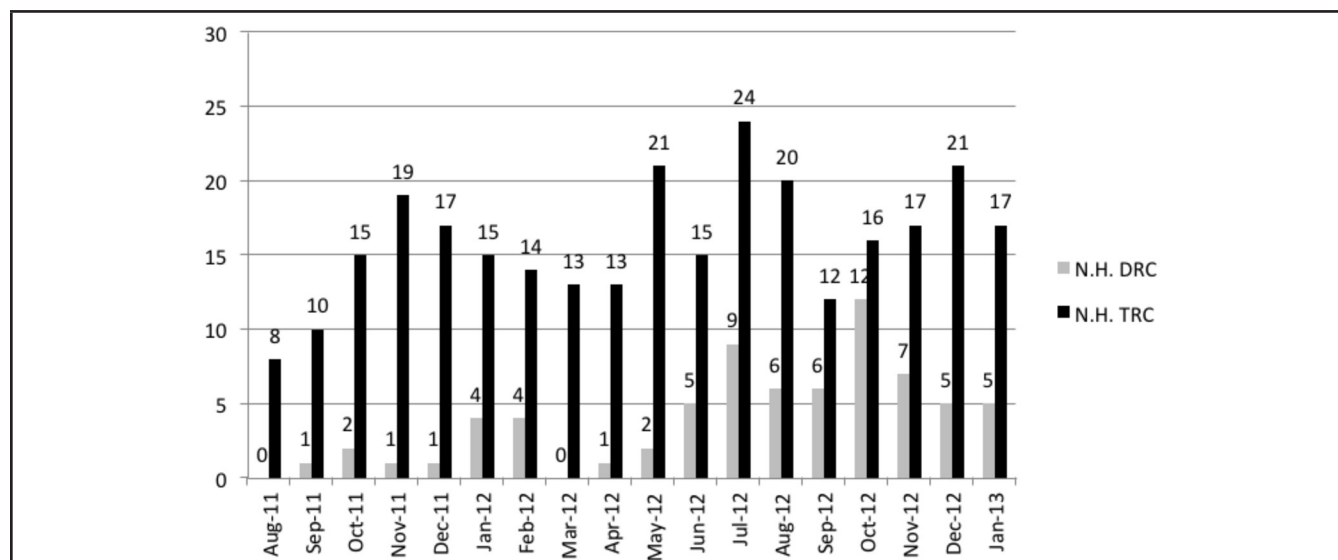


Figure 1. Summary of monthly counts of colonoscopy screenings (Native Hawaiians only) at Queen's Medical Center completed between August 2011 and January 2013, by referral types

DRC = Direct Referral Colonoscopy (n=71 Native Hawaiians); TRC = Traditional Referral Colonoscopy (n=287 Native Hawaiians); N.H. = Native Hawaiians

Variable	Total (n=358)	By Type of Referral		P-value*
		Direct Referral (n=71)	Traditional Referral (n=287)	
Age (n, %)				.002
50-54 years	167 (47%)	42 (59%)	125 (44%)	
55-64 years	132 (37%)	26 (37%)	106 (37%)	
65-75 years	59 (16%)	3 (4%)	56 (20%)	
Gender (n, %)				.38
Male	170 (47%)	37 (52%)	133 (46%)	
Female	188 (53%)	34 (48%)	154 (54%)	
Ethnicity (n, %)				.65
Hawaiian	250 (70%)	48 (68%)	202 (70%)	
Part-Hawaiian	108 (30%)	23 (32%)	85 (30%)	
Marital Status (n, %)				.28
Single	97 (27%)	14 (20%)	83 (29%)	
Married	221 (62%)	49 (69%)	172 (60%)	
Divorced/Widowed/Separated	40 (11%)	8 (11%)	32 (11%)	
Type of Medical Insurance (n, %)				<.001
Private	255 (71%)	62 (87%)	193 (67%)	
Public	103 (29%)	9 (13%)	94 (33%)	

n = number of patients. % = percentage of patients. *: Significance at $\alpha=0.05$, based on Chi-square or Fisher's exact tests.

Discussion

The results obtained reveal a bias towards private insurance for Native Hawaiian patients undergoing screening colonoscopy via either the direct referral or traditional referral processes. Possibly, this reveals an underlying tendency for providers to favor patients with private health insurance.^{35,36} The interpretation of why the direct referral system reached a smaller proportion of patients with public insurance than the traditional referral systems is unclear. Since patients in the direct referral program were significantly younger on average than those in the traditional referral system, the finding could simply reflect the smaller proportion of Medicare patients in the former group.

The lower average age of patients in the direct referral program than the traditional referral system needs further exploration. This is most likely not related to insurance coverage issues since in Hawai'i, public and private insurance provides similar coverage for colonoscopies for people over 50 years of age.^{37,38} Possibly, the finding that patients in the direct referral program were significantly younger could be a result of the strict eligibility criteria for the direct referral program. Eligibility criteria were developed to identify those at increased risk for procedural complications who would benefit from a pre-consultation office visit with a gastroenterologist.³⁹ The eligibility criteria may have resulted in older patients being considered ineligible because they may have more co-morbidities.⁴⁰

Studies report 90% 5-year survival rates after early diagnosis and treatment of colorectal cancer at a localized stage, with eventual decrease in survival rates as the cancer spreads to distant organs.² In Hawai'i, only about 44% of the colorectal cancer cases were diagnosed at an early stage between the years 2000 and 2005. Several studies have reported older age to be a risk factor for developing colorectal cancer.⁴¹⁻⁴⁴ Screening rates are increasing with the aging population in Hawai'i³; however, Native Hawaiians (62.8%) still have lower uptake of screening procedures compared to Japanese (74.2%).¹⁷ Preventive efforts made by Queen's Medical Center through the DRC program are aimed to increase uptake of colonoscopy screening procedures. The overall screening rate among Native Hawaiians at this facility appeared to be generally low in both the programs. However, there was no information available on the distribution of Native Hawaiians or other races/ethnicities in the population from which patients were referred for colonoscopy screening. As a result, it is not known whether there were disparities in colonoscopy screening among Native Hawaiians. Future studies are recommended with more baseline data on all races/ethnicities and those with complete and incomplete colonoscopy screenings to assess and compare completion rates of Native Hawaiians with non-Native Hawaiians in both the referral programs at the Queen's Medical Center. In the current study, the completion of direct referral colonoscopy was found to be lower among those aged 65-75 years than younger age groups and higher completion of direct referral colonoscopy was found among those with private insurance compared to public insurance.

The study has several limitations. First, the use of convenience sampling can lead to selection bias. The DRC eligibil-

ity criteria were designed to capture healthy patients with less co-morbidities, which may have deemed many older patients ineligible and resulted in selection bias. Second, receipt of a screening colonoscopy was identified with a diagnostic code or use of the word "screening" in the pre-operative diagnosis, so patients could have been missed if the procedure was coded differently or misspelled. However, differential misclassification bias is not expected, because coding and misspelling would not occur more in one group than the other as all patients in both groups were scheduled by the same schedulers. Third, use of a single site center could minimize generalizability. Fourth, Native Hawaiian ethnicity was self-reported, and was not verified. Fifth, the study only compared screening rates among Native Hawaiians between the two referral programs, ignoring potential differences among other racial/ethnic groups. Lastly, the direct referral program underwent restructuring in Spring 2013, which led to changes in eligibility criteria that would allow more patients to be eligible for the current direct referral program; this change may have influenced the proportion of patients eligible for DRC, but would not be expected to result in differential misclassification by race-ethnicity.

Our study reveals a tendency for younger and privately insured Native Hawaiian patients at a single facility to be directly referred for screening colonoscopy and future studies should be performed to determine the reason for this. Perhaps the strict criteria used for the DRC program discouraged the referral of older individuals as they had more co-morbidities. In addition, the rate at which various colorectal cancer screening modalities, as recommended by the USPSTF, are being offered to eligible Native Hawaiians needs to be compared with rates offered to non-Native Hawaiians. Much work needs to be performed to improve colorectal cancer screening rates in Native Hawaiians in order to reduce colorectal cancer mortality but the barriers to screening must first be identified.

The findings of this study will be helpful in further restructuring and expanding the current DRC program at the Queen's Medical Center. Although the study was unable to identify specific patient barriers, differences between patients in the two referral programs helped to reveal system barriers that need to be explored. The first major system barrier that warrants further investigation is the eligibility criteria for the DRC program. The DRC program will be staffed with an Advanced Practice Registered Nurse (APRN) that will allow for thorough screening of all referrals, scheduling pre-consultation office appointments with patients who may have otherwise been deemed ineligible for the program, and will also allow the gastroenterologist to focus on more complex patients. Through staffing with an APRN, the DRC program should be able to capture older populations as these patients can now be seen in the office by the APRN to review medical history and complete a physical assessment. Secondly, although DRC welcomed all referrals irrespective of the coverage offered by the patients' health insurance plans, the bias towards privately-insured patients likely occurred at the level of referring physicians' offices. Most of the state of Hawai'i's Medicaid patients were seen in local community

clinics, whereas, most of the privately-insured patients were seen by private practitioners. However, it is unknown if there were significant differences in colonoscopy referrals between community clinic providers and private practitioners. These findings underscore further studies to determine the causes of variability in referrals for colonoscopy screening among Native Hawaiians.

Among Native Hawaiians, the overall colonoscopy rate at Queen's Medical Center was only around 13% when both the referral programs were combined. Although younger patients and those with private insurance were captured by the DRC, future studies including all racial/ethnic groups and incomplete colonoscopy screenings are recommended to assess completion rates among Native Hawaiians compared to non-Native Hawaiians and to identify patient barriers for screening. An overall DRC program evaluation is recommended, including an evaluation of patient satisfaction and the financial impact of the program. Identification of screening barriers and overall evaluation of the program would be important to determine if interventions are needed in the current DRC program to further reduce disparities in colonoscopy screening among Native Hawaiians at Queens Medical Center.

Conflict of Interest

None of the authors identify a conflict of interest.

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