

**PATIENT KNOWLEDGE AND EXPECTATIONS AT INITIAL
PRESENTATION FOR ARTHROPLASTY:
THE ROLE OF GENDER AND ETHNICITY**

Michele R. D'Apuzzo, MD¹
Javad Parvizi, MD²
Carlos Lavernia, MD¹
Peter Sharkey, MD²
Robert Barrack, MD³
Victor H Hernandez¹

1. Orthopaedic Institute at Mercy Hospital. Miami (FL)
2. Rothman Institute. Philadelphia (PA)
3. University of Washington. San Luis (MS)

Corresponding author:
Carlos J. Lavernia, MD
Orthopaedic Institute at Mercy
3659 S. Miami Ave Ste 4008
Miami, FL 33133
Phone: (305)285-5085
Fax: (305)285-5084
CLavernia@mercymiami.org

INTRODUCTION

In 2004 there were an estimated 41.3 million Hispanics in the United States.¹ Hispanics account for 14.1% of the United States population and are the largest ethnic minority population with African Americans now a close second.¹ The growth of the Hispanic population through 2020 is projected to be larger than the growth of all other race/ethnic groups combined.²

Approximately 600,000 primary joint replacement surgeries of the hip and knee are performed annually in the United States.³ Conservative projections estimate that more than 750,000 of these procedures will be performed by the year 2030.⁴ Given these trends combine with the growing life expectancy associated with improvements in living conditions and advances in medical a larger number of Hispanic patients will require joint replacement procedures.

Little is known about preoperative patient characteristics and perceptions of patients who undergo arthroplasty surgery. Previous studies have found significant differences in the utilization and outcome of joint replacement procedures among ethnic groups and between genders.⁵⁻¹⁴ For example, arthroplasty rates in blacks and Hispanics are lower than in non-Hispanic whites even after adjustment for differences in arthritis prevalence rates.¹⁵ Hispanics and Blacks present for arthroplasty with more disease and disability relative to non-Hispanic whites raising the possibility that these groups may be more likely to delay seeking treatment.¹⁶

Research in other fields of medicine indicate that the causes of health disparities are multifactorial and include patient-level factors such as delay in seeking and treatment refusal, limited access to health care, language barriers, health care provider bias and stereotyping.¹⁷ Patient characteristics such as perception and beliefs about joint replacement which may help to explain race- and ethnic- specific differences in arthroplasty rates have received little attention.

These characteristics may also be predictive of post-surgical satisfaction and outcome among patients who decide to undergo hip and knee replacement. Documenting these perceptions and beliefs will be helpful not only when counseling patients who are considering arthroplasty surgery but may also improve outcomes. Our objective was to assess and compare preoperative patient perceptions, attitudes and surgical knowledge among ethnic and gender sub-groups in patients receiving initial pre-arthroplasty consultation.

METHODS

Patients seeking medical consultation for hip and or knee pain in two large volume orthopaedic surgical practices located in Philadelphia and Miami were asked to complete an anonymous questionnaire prior to consulting with their physician. The six-page questionnaire contained questions about their beliefs regarding the effectiveness of joint replacement, their belief in the medical system in general and the orthopaedic surgeon in particular, their willingness to co-pay or pay for the surgical procedure and the potential problems after surgery. Participants were asked to circle the three most common complications following arthroplasty from a list, which included: infection, nerve injury, chronic headaches, heart attack, death, loss of the limb, blood clot in the leg, loss of sight, loss of energy, sexual dysfunction, and blood clot in the leg. Also included in the questionnaire was a list of 13-activities (e.g., kneeling, gardening, and driving) (Table 3). Participants were asked to indicate which of the activities they expected they would be able to participate in following surgery. An “Arthroplasty Knowledge Score” was calculated based on the answers of participants to five questions assessing knowledge about the effectiveness of arthroplasty, duration and intensity of pain following surgery, and the typical length of hospitalization. Participants were assigned a score of one for each correct response to the questions in table 4: 1) Do you think a total joint replacement surgery is an effective surgery? (Yes=1); 2) How long will I be in the hospital following a total joint replacement (5-7 days=1); 3) If you have pain do you think it will be appropriately controlled? (Yes=1); 4) The amount of pain I would expect following a total joint replacement is: (minimal or moderate=1); and 5) I expect the pain to last: (a few days/weeks=1). Participants answering all or 4 of 5 questions correctly were considered to have a high degree of knowledge about the surgical procedure.

Analysis

Chi-square and Student's t-tests were used to compare subgroups of patients categorized by gender and by ethnicity (Hispanic versus non-Hispanic). Multivariate logistic regression analysis was used to examine the association between socio-demographic characteristics and willingness to pay for all or part of costs associated with arthroplasty. Poisson regression was used to evaluate the association between socio-demographic characteristics and the number of 13 listed activities they expected to participate in after recovering from their surgery.

RESULTS

A total of 502 patients completed questionnaires at the two study sites (Table 1). Relative to those in Miami, Philadelphia participants were more likely to be male (43% versus 29%), black (13% versus 3%), and to report hip problems (40% versus 25%). Participants at the Miami site were more likely to be of Hispanic origin relative to Philadelphia participants (76% versus <1%) and were also older (70 versus 62 years).

Arthroplasty Knowledge Scale

Men were more likely to receive a score of 4 or 5 on the arthroplasty scale relative to women (44% versus 31%; $p<0.05$). Non-Hispanics were also more likely to receive a score of 4 or 5 on this scale relative to Hispanics although this difference was not statistically significant (39% versus 29%; $p<0.05$).

Perceived Complications

Table two displays the percentage of participants who identified arthroplasty complications. Of note, 98 participants failed to identify any arthroplasty complications; table percentages are based on those participants who circled at least one potential arthroplasty complication from the list of 11. Irrespective of gender and ethnicity the most commonly selected complication was infection. Gender specific analysis indicated that females were more likely to list heart attack relative to males (26% versus 16%; $p<0.05$), while males were more likely to endorse death as an arthroplasty complication relative to females (49% versus 38%; $p<0.05$). Relative to non-Hispanics, Hispanics were significantly more likely to cite nerve injury (42% versus 10%; $p<0.001$), loss of the limb (21% versus 5%; $p<0.001$), blood clot in the leg (44% versus 18%; $p<0.001$), and blood clot in the lung (18% versus 9%; $p<0.05$). In contrast, non-Hispanics were more likely to endorse the following complications relative to Hispanics:

infection (90% versus 71%; $p < 0.001$); death (51% versus 10%; $p < 0.001$); and loss of energy (64% versus 14%; $p < 0.001$).

The single most frequently selected complication in all sub-groups was infection. Loss of energy was the second most frequently selected complication in all sub-groups with the exception of Hispanics who selected nerve injury. Death was the third most frequently selected complication by all sub-groups with the exception of Hispanics who selected blood clot in the leg.

Expected Activity Participation

Males were more likely to indicate that they would be able to perform a variety of activities following arthroplasty relative to females (Table 3). The largest gender-based differences included the ability to golf (56% versus 30%; $p < 0.001$), ride a bicycle (77% versus 52%; $p < 0.001$), and engaging in sexual relations (81% versus 58%; $p < 0.001$). The average number of expected activities was greater in males versus females (9.0 versus 6.3). Non-Hispanics were significantly more likely to indicate they would be able engage in all Table 3 activities relative to non-Hispanics. Figure 1 shows that the average number of expected activities displayed was nearly twice that in non-Hispanics relative to Hispanics (8.8 versus 4.6; $p < 0.001$).

Willingness to Pay

Participants were asked to indicate if they would be prepared to pay for their total joint replacement surgery if their insurance company would not. Males were significantly more likely to respond positively to this question relative to women (37% versus 26%; $p < 0.05$). Males were also more likely to indicate they were willing to pay at least \$500 to have the procedure performed relative to females (20% versus 12%; $p < 0.05$). There were no significant differences

in the percentage of Hispanics and non-Hispanics willing to pay for surgery (29% versus 30.0%) and willing to pay at least \$500 to have the procedure performed (14% versus 16%).

DISCUSSION

There are clear differences in populations on the basis of personal characteristics such as race and gender in the utilization of medical care, from preventive and diagnostic interventions to medical and surgical procedures, even after adjusting for diagnosis and severity of illness.^{15, 18-26} It is unclear why these disparities exist, although a number of potential explanations have been discussed, the most obvious is access to care. Lower income and uninsured individuals are likely to have difficulty understanding alternatives as well as receiving appropriate care.²⁷ Minorities are more likely to be uninsured, however disparities in health care utilization are not wholly explained by financial impediments to care.¹⁹

Alternatively, a number of interrelated elements may affect services utilization after a patient has entered the medical system. These include patient preferences for, and acceptance of procedures. There is some evidence that African Americans are more likely to refuse cardiac and other procedures compared to whites,²⁸⁻³⁰ despite higher recommendation rates.³¹ Also, when presented with clinical scenarios, African American patients reported that they were less likely to favor surgery than white patients.³² Thus, patient preferences and acceptance may drive some of the differences in utilization.

These variations have been also well documented in patients undergoing primary total joint replacement,^{5-7, 10, 13, 15, 16, 33-40} and although, the health effects of these disparities is not clear, there is evidence that when this procedure is performed on patients with advanced functional deterioration the outcomes are poorer.^{41, 42}

We believe that patients preferences are based on patient expectation and overall knowledge of the procedures they are offered such as arthroplasty and that identification of such

expectations and patient beliefs could potentially lower or minimize the variations seen in joint replacement utilization and perhaps diminish complications and improve outcomes.

Hawker et al,¹⁵ reported that when compared with men, women were less likely to have undergone arthroplasty, and those with potential need were less likely to have discussed arthroplasty with a physician. After adjustment for the degree of willingness to undergo this procedure, the potential need for arthroplasty was more than three times greater in women than in men, furthermore, women were more likely than men to be disabled by arthritis. This correlates with previous studies presented by our group^{43, 44} in which females had worst preoperative status when compared to men. Furthermore these differences persisted up the 2nd year after surgery.

Our present results help to understand such findings since men had higher expectations than women, specifically in the expected level of activity and number of activities they were going to achieve after the procedure. This could be explained by the fact that men had a better understanding of the procedure as reflected by a higher arthroplasty knowledge scale, and correlates to a significant difference in the willingness to pay for the procedure.

We have previously reported on the association between poor preoperative status and ethnicity.¹⁶ These results clearly show a significant difference in the expected number of activities between ethnicity subgroups and may help explain why Hispanics delay seeking treatment resulting in worst preoperative status. Expectations of the type of activities that patients are able to perform after these surgeries may be indicative of a lack of information or ignorance with respect to the potential outcomes.

The items used in our surveys were presented in simple, brief terms and address symptom-related, functional, and psychosocial expectations. Evaluation of these expectations can be valuable interns of outcomes and increasing the access of the intervention. Together patients and orthopedists can assess fulfillment of expectations. This may be particularly helpful for patients who are dissatisfied with the outcome. Additionally knowing these expectations helps physicians to provide more focused clinical care, highlights areas for patient education, and promotes shared decision-making when several treatment options are available. Involving patients in their care by discussing expectations has also been shown to increase patients' adherence to recommendations. Better understanding of these questions might help identify targeted interventions to better prepare patients for specific health care experiences. Further studies addressing the relationship of these characteristics and patient's outcomes after joint replacement are needed.

In conclusion patients undergoing primary joint replacement of the hip and knee have significant ethic and gender differences regarding expectations and knowledge of the intervention. Although delay in seeking of treatment for joint arthritis is multifactorial, we believe that patient expectations play a major role in the utilization of joint replacement and result in poor preoperative status and suboptimal outcome especially for females and Hispanics.

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Figure 1. Mean number of expected postoperative activities

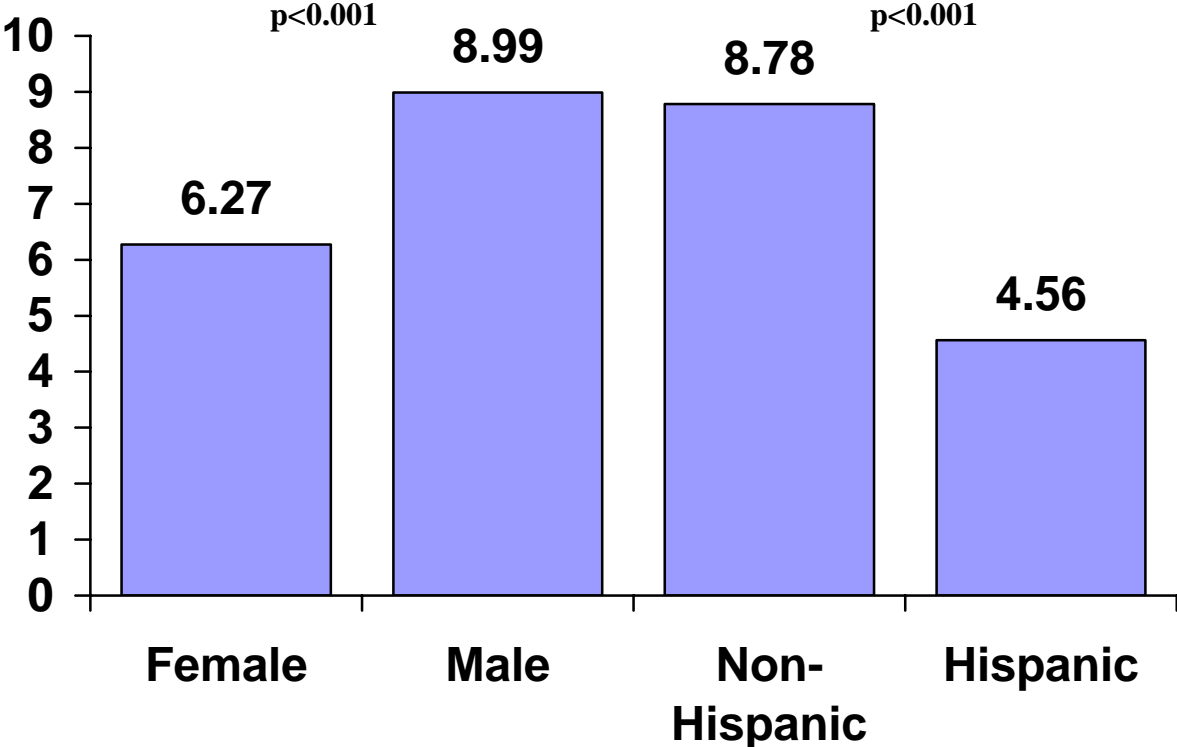


Figure 2. Knowledge Score

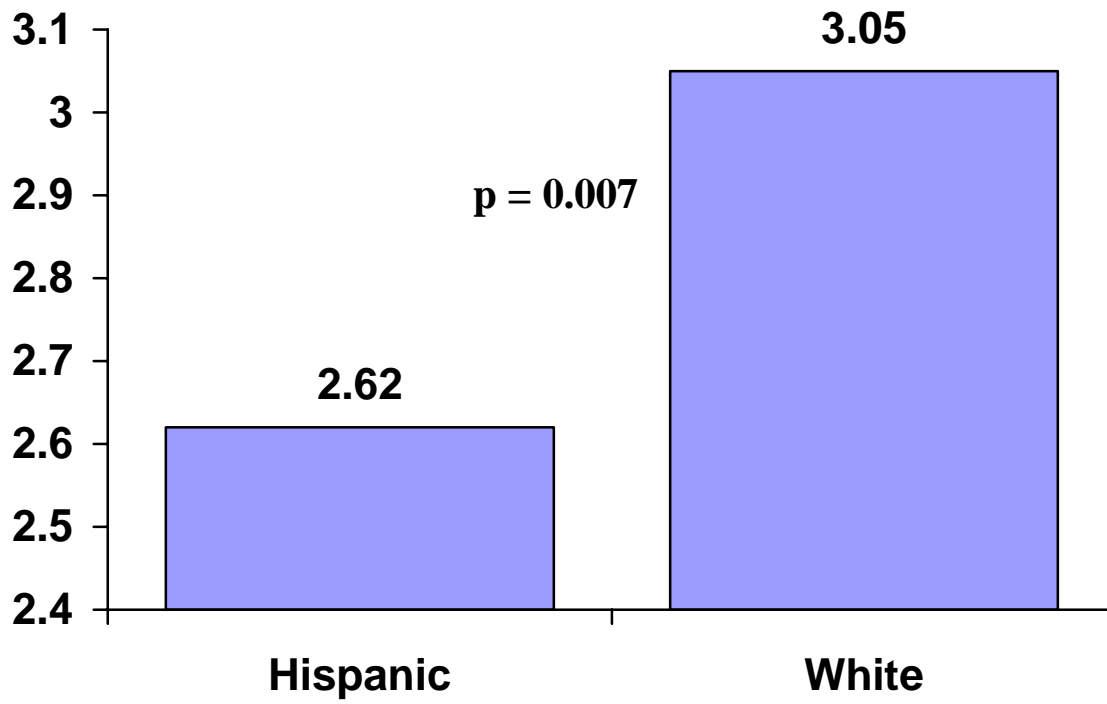


Figure 3. Knowledge Score

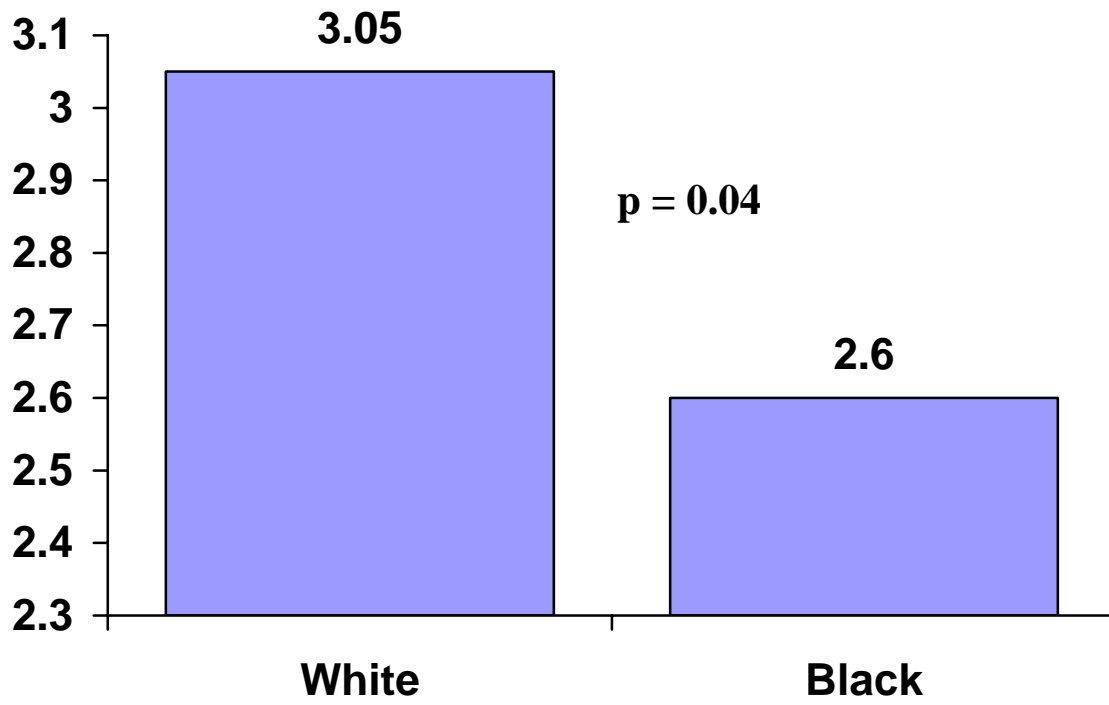


Figure 4. Willingness to Pay (Will Pay for It)

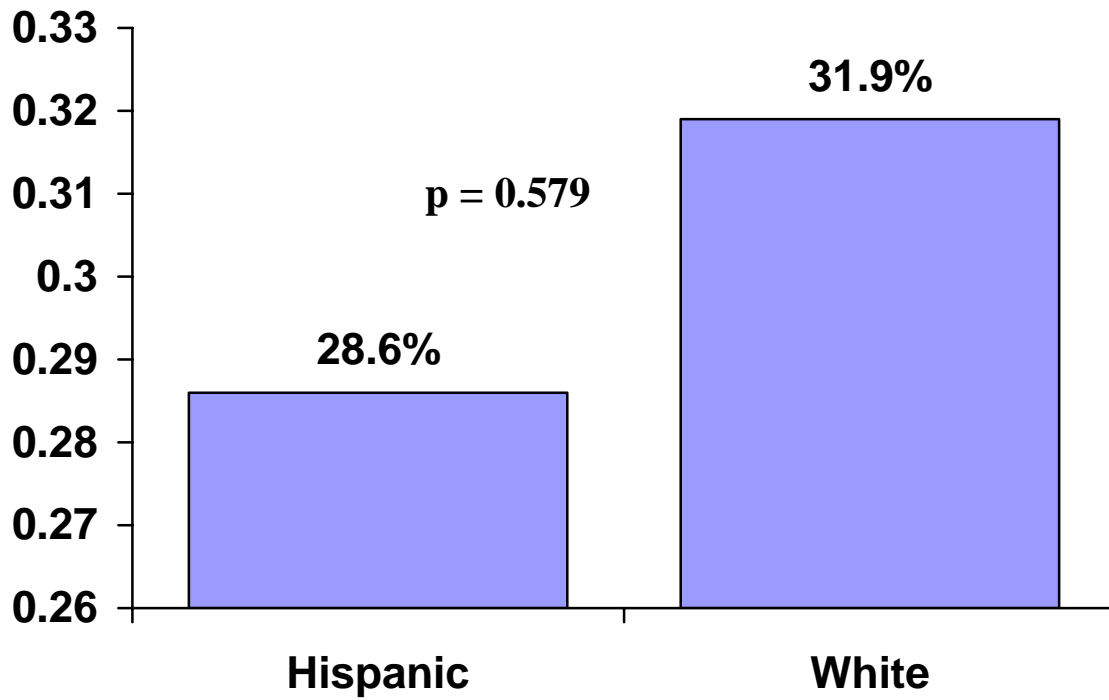


Table 1. Socio-demographic status of participants enrolled at the two study sites.

Social & Demographic Variables	All Sites		Philadelphia		Miami	
	N†	Mean (SD) / %	N	Mean (SD) / %	N	Mean (SD) / %
Age	480	64.5 (13.2)	333	62.0 (12.8)	147	70.0 (12.7)
Gender						
Male	193	38.6	145	43.4	48	28.9
Female	307	61.4	189	56.6	118	71.1
Race						
Black	47	9.8	42	12.7	5	3.4
Non-Black	434	90.2	290	87.3	144	96.6
Ethnicity						
Non-Hispanics	366	76.1	330	99.4	36	24.2
Hispanics	115	23.9	2	0.6	113	75.8
Reason for Visit						
Hip	168	35.5	132	39.9	36	25.4
Knee	274	57.9	177	53.5	97	68.3
Both	31	6.6	22	6.6	9	6.3
† A total of 502 patients participated in the study. Sample size for each socio-demographic indicator varied due to missing values.						

Table 2. Expected most common complications by gender and ethnicity

Most Common Complications	Gender		Ethnicity	
	Female (n)	Male (n)	Hispanic (n)	Non-Hispanic (n)
Infection	83.9 (203)	88.8 (143)	70.8 (51)	90.2 (286)***
Nerve Injury	18.2 (44)	16.8 (27)	41.7 (30)	10.4 (33)***
Chronic Headaches	0.4 (1)	1.2 (2)	2.8 (2)	0.3 (1)
Heart Attack	26.4 (64)	15.5 (25)*	22.2 (16)	22.7 (72)
Death	38.0 (92)	49.1 (79)*	9.7 (7)	51.1 (162)***
Loss of Limb	8.7 (21)	8.7 (14)	20.8 (15)	5.4 (17)***
Blood Cloth in the Leg	25.6 (62)	19.9 (32)	44.4 (32)	18.0 (57)***
Loss of Sight	1.7 (4)	1.9 (3)	0.0 (0)	2.2 (7)
Loss of Energy	54.5 (132)	55.3 (89)	13.9 (10)	64.0 (203)***
Sexual Dysfunction	0.8 (2)	0.6 (1)	0.0 (0)	0.9 (3)
Blood Cloth in the Lung	9.9 (24)	11.2 (18)	18.1 (13)	8.8 (28)*
*p<0.05; **p<0.01; ***p<0.001				

Table 3. Do you expect to be able to do the following activities after a total joint replacement?

	YES	NO	UNSURE
Walking several blocks without an assistive device			
Climbing a flight of stairs without rest			
Lifting and carrying heavy packages such as groceries			
Kneeling			
Gardening			
Swimming			
Golf			
Tennis			
Dancing			
Running			
Driving			
Riding a bicycle			
Engaging in sexual relations			

Table 4. Arthroplasty Knowledge Score.

- 1) Do you think a total joint replacement is an effective surgery?
 Yes No Unsure

- 2) How long will I be in the hospital following a total joint replacement?
 1 Day 3 Days 5-7 Days 10 Days
 2 Weeks Unsure

- 3) If you do have pain, do you think it will be appropriately controlled?
 Yes No Unsure

- 4) The amount of pain I would expect following a total joint replacement is
 None Trace Minimal Moderate Extreme