

Impact of Preoperative Education on Pain Management Outcomes After Coronary Artery Bypass Graft Surgery: A Pilot

**Judy Watt-Watson, Bonnie Stevens, Judy Costello,
Joel Katz, and Graham Reid**

Selon des observations, certains patients reçoivent une quantité inadéquate d'analgésiques, et ce malgré la présence de douleurs moyennes ou fortes à la suite d'un pontage aortocoronarien. L'objectif de cette étude pilote était de faire l'évaluation d'une brochure éducative préadmission à l'intention de patients qui vivent pour une première fois et sans complication ce type d'intervention. Une étude sur échantillon aléatoire et contrôlé a été entreprise au plus grand centre de soins cardiovasculaires du Canada. Des mesures ont été prises à plusieurs reprises pour permettre de comparer les données de trois entrevues : au point de départ, au jour trois et au jour 6. À la clinique de préadmission, les patients ont été aléatoirement assignés à l'un des trois groupes, et ce deux à sept jours avant la chirurgie : (1) brochure générique et vidéocassettes sur les procédures d'hôpital (contrôle), (2) contrôle et brochure sur la douleur, ou (3) contrôle et brochure sur la douleur et entrevue; 45 sujets ont participé aux trois entrevues. Le formulaire questionnaire abrégé sur la douleur de McGill et le questionnaire sur les résultats des soins prodigués au patient de la American Pain Society constituaient les instruments de mesure. Tous les groupes avaient eu l'expérience d'un traitement analgésique inadéquat (19,89[13,37] mg d'équivalents morphiniques aux 24 heures) malgré des douleurs persistantes (6,63[2,46], 0-10). Toutefois, les patients qui ont bénéficié des interventions en plus de soins de contrôle ont reçu 46 % plus d'analgésiques que les patients qui n'ont uniquement reçu que des soins de contrôle et étaient plus à l'aise de demander de l'aide ou de prendre des analgésiques. La brochure d'intervention ou les mesures n'ont pas nécessité de changements.

Patients have been found to receive inadequate analgesia despite moderate to severe pain after coronary artery bypass graft (CABG) surgery. The purpose of this pilot study was to evaluate a preadmission educational booklet for patients undergoing their first uncomplicated CABG. A randomized controlled trial (RCT) was undertaken at the largest cardiovascular centre in Canada. Repeated measures were used to compare data from

Judy Watt-Watson, RN, PhD, is Associate Professor, Faculty of Nursing, University of Toronto, Ontario. Bonnie Stevens, RN, PhD, is Professor, Faculty of Nursing, University of Toronto. Judy Costello, RN, MScN, is Director of Nursing, Toronto General Hospital. Joel Katz, PhD, is associated with the Department of Anaesthesia, University of Toronto, the Acute Pain Research Unit of the Toronto General Hospital, and Mount Sinai Hospital, Toronto. Graham Reid, PhD, is associated with the Department of Psychology, University of Toronto, and the Toronto General Hospital.

3 interviews: at baseline, day 3, and day 5. Patients were randomly assigned to one of 3 groups at the preadmission clinic 2 to 7 days before surgery: (1) generic hospital booklet and videotape (control), (2) control + pain booklet, or (3) control + pain booklet and interview; 45 subjects completed all 3 interviews. Measures were the McGill Pain Questionnaire-Short Form and the American Pain Society Patient Outcome Questionnaire. For all groups, analgesic administration was inadequate (19.89[13.37] mg morphine equivalents/24 hours) despite unrelieved pain (6.63[2.46], 0–10). However, patients receiving the interventions in addition to control care received 46% more analgesia than patients receiving control care alone and had fewer concerns about asking for help and taking analgesia. Changes were not required in the intervention booklet or measures.

Introduction

Cardiovascular diseases, as the major cause of death, disability, and illness in Canada, have a significant impact on our health-care system. The treatment of cardiovascular diseases has accounted for almost 20% of all hospital stays in Canada. Coronary artery bypass graft (CABG) surgery involves many pain-sensitive structures, particularly with internal thoracic artery grafts as conduits. Our recent study with 225 CABG patients found that many reported considerable unrelieved pain and received inadequate analgesia following surgery (Watt-Watson, Garfinkel, Gallop, Stevens, & Streiner, in press). Only 47% of the prescribed analgesia was administered although most patients (83%) reported moderate to severe pain. Despite their pain, patients had concerns about taking analgesia, yet opioid analgesics are the cornerstone of management of moderate to severe postoperative pain (Agency for Health Care Policy and Research [AHCPR], 1992). Patients had prior severe pain and experienced considerable postoperative pain, yet did not seek help for their pain.

CABG education programs have had minimal or no pain-related content. While postoperative analgesic use has been examined to evaluate CABG recovery (Anderson, 1987; Rice, Mullin, & Jarosz, 1992; Schindler, Shook, & Schwartz, 1989), the general-education intervention did not result in a change in analgesic intake by patients. Beggs et al.'s (1998) survey of 300 postoperative CABG patients identified pain expectations as one area for potential improvement in discharge information. However, we found no research that examined the impact of a preoperative pain-education intervention on pain-related postoperative outcomes for CABG patients. The degree to which such an intervention might result in increased analgesic intake, decreased pain and related interference with activities, and fewer patient concerns about seeking help and taking analgesics, is unknown. Therefore, a pilot study was carried out to evaluate the feasibility and clinical value of providing the

booklet *Pain Relief After Surgery* versus standard routine education for preoperative patients undergoing CABG.

Review of the Literature

Inadequate Analgesia and Pain Management

Studies in surgical settings have documented that patients receive the lowest analgesic doses possible (Close, 1990; Donovan, Dillon, & McGuire, 1987; Faherty & Grier, 1984; Owen, McMillan, & Rogowski, 1990; Paice, Mahon, & Faut-Callahan, 1991; Watt-Watson et al., in press; Watt-Watson & Graydon, 1995; Winefield, Katsikitis, Hart, & Rounsefell, 1990) and that inadequate analgesia is administered in the first 3 days after CABG surgery (Maxam-Moore, Wilkie, & Woods, 1994; Puntillo, 1990; Puntillo & Weiss, 1994; Watt-Watson et al., in press). Moreover, recent data indicate that patients in cardiovascular settings, including postoperative CABG patients, have considerable unrelieved pain (Puntillo; Puntillo & Weiss; Watt-Watson et al., in press). Pain ratings have been significantly higher on day 5 for patients with internal thoracic artery grafts (ITA) (6.35 ± 1.77 vs. 3.82 ± 1.98 , $p < 0.0002$, 0–10) (Cohen et al., 1993), and for some patients pain has continued after discharge (Goodman, 1997; Redeker, 1993). In a recent study with 225 CABG patients, we found that many received inadequate analgesia even though they experienced moderate to severe pain after surgery (Watt-Watson et al., in press). On average, patients received 14 mg of morphine equivalents in the previous 24 hours over their 2nd to 3rd postoperative day, which is similar to doses reported for other cardiovascular studies (Puntillo; Puntillo & Weiss). Patients did not voluntarily ask the nurse for analgesia and received only 47% of their prescribed dose. Patients documented both high ratings for pain before receiving medication and inadequate relief after receiving it.

Patients with a median sternotomy incision have demonstrated impaired postoperative pulmonary function, particularly after the more painful ITA graft (Cohen et al., 1993). Moreover, atelectasis after cardiovascular surgery has been found to be greater in patients with higher pain intensity (Puntillo & Weiss, 1994). For most people, opioid analgesics are essential for the relief of moderate to severe postoperative pain (AHCPR, 1992). Wilder-Smith and Schuler (1992) report that patients who expressed concerns about toxicity and drug addiction and who believed in the normality of experiencing pain did not accept analgesia until a nurse pain specialist discussed these issues with them. The authors conclude that discussion of analgesic therapy with patients is an important step in improving postoperative pain relief. Ward et al.

(1993) identified eight concerns of cancer patients that influenced their use of analgesics and reporting of pain. These included fear of addiction, fear of side effects, and a belief that "good" patients do not complain of pain. Undermedicated patients in this sample had significantly higher levels of concern and pain interference. Older and less educated patients were found to be more reluctant both to report pain and to use analgesics, and those with more concerns had higher pain levels. Patients undergoing CABG surgery tend to be older and to be reluctant to disclose their concerns about treatment.

Preoperative Patient Education

Several researchers have clearly documented the positive effect of preoperative general education on postoperative outcomes. Hathaway (1986), in a meta-analysis of 68 studies, found that 67% of patients who received preoperative education had more favourable postoperative outcomes, including physiological outcomes, than patients who did not receive the education; their outcomes were 20% better, with a mean effect size of 0.44. Devine and Cook (1983), in their meta-analysis of 102 studies of psychoeducational interventions with surgical patients, report the positive outcome of hospital stays shortened by 1.31 days ($ES = + 0.39$). As these meta-analyses reviewed evidence from both RCTs and non-RCTs, which were also of varying sizes and designs, caution is needed in drawing conclusions. The importance of including both sensory and procedural information in educating to accelerate recovery has been well established (Devine & Cook; Hathaway; Johnson, Fuller, Endress, & Rice, 1978).

The impact of perioperative cardiac education has been minimally examined (Moore, 1997), although patients being treated for cardiovascular disease often undergo CABG surgery, which in Canada costs about \$22,000 per patient (Heart and Stroke Foundation of Toronto, 1996; Reeder et al., 1995). While postoperative analgesic use has been examined for the purpose of evaluating the influence of education on CABG recovery (Anderson, 1987; Rice et al., 1992; Schindler et al., 1989), the lack of impact may reflect the general nature of the interventions. Beggs et al.'s (1998) survey of 300 postoperative CABG patients did identify pain expectations as one potential area for improvement in discharge information. However, much of the published research on the benefits of educating cardiac patients has focused on exercise programs in the lifestyle rehabilitation process following a myocardial infarct or surgery. For example, Mullen, Mains, and Velez (1992), in their meta-analysis of 28 controlled trials, report positive effects of patient educa-

tion on blood pressure (WAES + 0.51, 28% better), mortality (WAES + 0.24, 19%), and exercise and diet (WAES + 0.19, 14%). Only recently, with fiscal restraints requiring reduced staff, minimal preadmission time, and shorter hospital stays, have researchers begun to examine teaching methods for CABG education perioperatively.

The timing and type of preoperative teaching for CABG patients have been examined only minimally. Preadmission cardiac education using self-instruction booklets or structured interviews has positively influenced recovery. Christopherson and Pfeiffer (1980) report that CABG patients ($n = 41$) who received an educational booklet before surgery had higher postoperative knowledge scores [$t(18) = 2.30$, $P < 0.05$] and fewer days in the intensive care unit (2.82 vs. 4.67 days, $p < 0.05$) than the group who received postadmission informal education. No differences were evident between patients who received the booklet 1 to 3 weeks versus 1 to 2 days before surgery. The content of this 16-page booklet included physiology related to the disease and surgery, preoperative procedures, and postoperative sensations and expected behaviours. Rice et al. (1992) also used a self-instruction booklet preoperatively with CABG patients ($n = 50$). Patients who received the booklet on therapeutic exercises before admission reported more positive moods (27.6 ± 4.7 vs. 24.7 ± 5.5 , $p < 0.05$; scale range: 12–48), did the prescribed exercises more easily (16.9 ± 11.0 vs. 6.0 ± 5.5 , $p < 0.0001$; scale range: 0–34), and required less teaching time (10.2 ± 4.7 vs. 14.2 ± 8.8 min., $p < 0.05$) following surgery than those who received the booklet postadmission. The booklet did not address pain and no differences were evident in analgesic use between the two groups.

Cupples (1990) found that patients who received a single session of preadmission education 5 to 14 days before CABG surgery had better information recall preoperatively than those who received informal education the evening before surgery. These data suggest that one education session can be effective if given at a non-stressful time. As well, patients who received the formal preadmission education had significantly more positive mood states (10.4 ± 20.69 vs. 36 ± 45.09 , $p < 0.03$), more favourable physiologic recovery ($F[1,38] = 5.01$, $p = 0.03$), and earlier discharges (70% by day 6–7 vs. 45% starting at day 7) than the control group.

Overall, these data indicate that structured preadmission education, through either pamphlets or teaching sessions, is more effective than postadmission teaching just prior to surgery. Structured education was more effective using mood, physiological, and hospital-stay outcomes than informal sessions given by whatever staff was available.

However, in none of these programs was pain content discussed or pain assessed. Therefore, the aim of this study was to use a booklet that focused specifically on pain.

Methods

Subjects and Setting

An RCT was used with patients who were attending a standard preadmission education session 2 to 7 days before their elective CABG surgery. All consenting patients were randomized to the usual-care control group or to two intervention groups, using a table of random numbers. Data were collected by a blinded research assistant in four areas of a university-affiliated teaching hospital in Toronto, Ontario. The four areas consisted of the preadmission clinic and the three wings of the 85-bed cardiovascular surgical unit.

Our initial aim was to include both (a) patients for elective CABG surgery attending a preadmission clinic and admitted the day of their surgery, and (b) patients triaged from emergency departments in other hospitals and transferred to the research site the day before their surgery. However, the latter group did not arrive until the late afternoon or evening. They were not included in the trial because investigators felt their anxiety was too high at the time and because the preadmission education in the original hospital was very variable for this group. Therefore, the target population consisted of elective patients who were undergoing their first CABG (no repeat CABG or valve surgery), attending a standard preadmission education session, and able to understand, read, and speak English. The sample of 45 patients was accrued over 10 weeks.

Procedure

Ethical approval was received from the University of Toronto Office of Research Services and the participating hospital. Meetings were held with the nurse managers and staff to explain the study protocol and clarify related concerns.

Eligible patients attending the preadmission session were informed of the study by the cardiovascular nurse coordinator, who obtained their permission to release their name to the research assistant (RA). All patients who agreed were given verbal and written explanations of the study. Patients consenting to participate completed all questionnaires for baseline information prior to randomization. Five of the 50 consent-

ing patients who completed baseline measures were too ill or tired after surgery to complete all measures.

Consenting patients were randomly assigned to the (a) control group, receiving standard preoperative education only ($n = 16$), (b) intervention group receiving booklet ($n = 15$), or (c) intervention group receiving booklet and interview ($n = 16$). Forty-five patients responded at all three periods, as two patients in the intervention booklet-only group were too ill to participate after surgery. All patients were given the McGill Pain Questionnaire-Short Form (MPQ-SF) (Melzack, 1987) at the baseline preadmission clinic and on days 3 and 5 after surgery. The Patient Outcome Questionnaire (POQ) (American Pain Society Quality of Care Committee [APS], 1995), which examines interference with activities, concerns, and patient satisfaction, was also given on day 3 when increased ambulation is usually painful and on day 5 just prior to discharge.

Control group. All patients assigned to the control group received routine cardiovascular education, including a generic booklet and videotape offered 2–7 days before surgery during the standard preadmission session. The booklet and videotape contained general information about the surgery, postoperative care, and recovery, with minimal guidelines for pain management.

Intervention groups. Patients randomized to the two intervention groups received the standard education given to the control group. One group received an additional booklet with instructions to read it before surgery and to bring it to hospital. The other group received the additional booklet with instructions to read it before surgery and to bring it to hospital, as well as an interview by the research nurse, who discussed salient points in the booklet and answered questions.

Intervention manoeuvre. To maintain blinding of the research assistant and staff, all patients received an envelope containing a copy of their consent form and a letter thanking them for their participation. Patients in the two intervention groups also received the booklet *Pain Relief After Surgery*, which was developed by the investigators for this study. Content for this booklet was derived from previous research (APS, 1995; Ward et al., 1993; Watt-Watson et al., in press) and reflects the Canadian Pain Society position statement on pain relief (Watt-Watson, Clark, Finley, & Watson, 1999). The eight-page booklet discusses the importance of pain relief; how and when to ask for help; pain-relief methods, both non-pharmacological and pharmacological, including analgesia; and patients' concerns about seeking help with pain. It suggests optional ways of taking strong analgesia other than by

injection and emphasizes the individuality of pain responses and the importance of good pain relief to recovery. The booklet includes a numerical rating scale (NRS) to describe pain intensity and quality, similar to that used in the more general cardiovascular surgery educational booklet. It addresses common concerns that prevent patients from asking for help and/or taking analgesia. Face and content validity were assessed by pain experts in nursing, psychology, and medicine. The booklet was pretested for readability and understandability at the Grade 6 level.

Measures

Pain intensity and quality were measured using the self-report MPQ-SF, which has well-established reliability and validity (Dudgeon, Raubertas, & Rosenthal, 1993; Melzack, 1987). The MPQ-SF includes 15 verbal descriptors that are summed to obtain scores for the sensory and affective quality of pain. Pain intensity was measured using the Present Pain Intensity (PPI) and an NRS. The NRS measured pain intensity both at rest and on movement, as these ratings have been divergent in previous work (Watt-Watson et al., in press). The "unpleasantness" anchor has been established as a valid and reliable affective label (Gracely, McGrath, & Dubner, 1978).

Analgesic data were collected from the chart on days 3 and 5 by the RA and converted to standardized parenteral morphine equivalents (Reisine & Pasternak, 1996).

Interference with activities was assessed using a subscale of the Brief Pain Inventory 49 (BPI) included in the POQ, which has internal consistency and validity (APS, 1995; Daut & Cleeland, 1982; Daut, Cleeland, & Flanery, 1983; Serlin, Mendoza, Nakamura, Edwards, & Cleeland, 1995). The six items examined whether pain is severe enough to interfere with sleep, mood, and activities such as walking or deep breathing and coughing. The NRS were summed for a total subscale score.

Concerns about seeking help and taking analgesia were examined using a subscale derived from the Barriers Questionnaire (BQ), also included in the POQ, a 27-item instrument that has internal consistency, test-retest reliability, and construct and content validity (APS, 1995). This subset (BQ-SF) has established internal consistency ($\alpha r = 0.72$) and test-retest reliability ($r = 0.85$). The NRS were summed for a total subscale score. In this pilot, Cronbach's alpha was 0.71 for the POQ-BPI

and 0.85 for the POQ-BQ, indicating good to very good internal consistency for these measures.

Patient satisfaction was measured using the three NRS on general satisfaction from the POQ, which were summed for a total subscale score. Extensive evidence for validity of patient satisfaction questions has been established by Ware and colleagues (Ware & Hays, 1988; Ware, Snyder, Wright, & Davies, 1983). Additional questions (APS, 1995) facilitated an understanding of specific issues related to the overall satisfaction score. The stems of the instruction items were modified to reflect an inpatient versus an outpatient setting.

Length of hospital stay data were obtained from the patient's chart.

Data Analysis

The intention-to-treat principle (Newell, 1992) was maintained so that individuals randomized to the intervention group were included in this group even if they did not read the booklet or were unable to complete measures postoperatively. An alpha of 0.05 was the level of significance used for all analyses. Intervention- and control-group data were compared using chi-square analysis for discrete-level data and analysis of variance (ANOVA) for continuous-level data on demographic and pre-intervention variables to assess the comparability of groups at baseline. Descriptive statistics (i.e., averages, standard deviations, proportions) were used to summarize outcome variable data at all time periods.

A mixed repeated measures (RM) ANOVA was performed to determine the efficacy of the pain-education intervention versus standard education on analgesic intake between subjects (treatment vs. control) and within subjects (over time). Separate ANOVAs (treatment vs. control) were performed for each of the following dependent variables: postoperative pain, interference with activity, concerns, satisfaction, and length of stay. A mixed between (treatment vs. control) and within (pre- vs. postintervention) ANOVA was performed for analgesia concerns to determine whether the intervention had a significant impact on patients' misconceptions regarding analgesic use. For significant ANOVAs with all outcomes, post-hoc comparisons using Tukey's Honestly Significant Difference test (Norman & Streiner, 1994) were used to determine the source of the difference. As well, patient gender, age, and preoperative pain (as measured by the MPQ) were considered as covariates.

Table 1 *Characteristics, Length of Stay, and Satisfaction*

Outcome		Control M(SD)	Treatment A Control + Booklet M(SD)	Treatment B Control + Booklet + Interview M(SD)
<i>Characteristics*</i>				
Age (years)		60.13 (11.0)	64.18 (7.44)	57.06 (9.86)
Females		1	2	2
Number of ACB grafts		3.44 (1.03)	3.57 (0.76)	3.69 (0.60)
Pain expected		5.00 (2.31)	5.53 (2.0)	6.24 (2.51)
<i>Length of stay (days)*</i>				
		5.13 (0.99)	5.0 (0.9)	6.06 (1.39)
<i>Satisfaction with care**</i>				
(0–30)	T ₁	20.94 (8.63)	26.71 (9.37)	24.44 (8.36)
	T ₂	25.94 (4.25)	26.50 (4.83)	25.56 (9.75)
	T ₃	24.25 (8.09)	24.01 (6.08)	26.50 (4.05)
* differences not significant ** $p < 0.06$				

Results

Patient characteristics and length of stay were similar for all three groups at baseline (see Table 1). The average patient was a 61-year-old male with 3.5 grafts including an internal thoracic artery (ITA) who remained in hospital for 5 days. Eleven patients were women.

Using ANOVA for RM, we found no differences among the three groups for pain measures at days 3 and 5 after surgery (see Table 2). The mean (SD) levels of the PPI did not change significantly from day 3 [2.43(1.07)] to day 5 [2.29(1.06)] and were not significantly different between groups (see Table 2). As well, the mean (SD) numerical rating for worst pain in the previous 24 hours did not change significantly from day 3 [6.63(2.46)] to day 5 [6.0(2.91)] or differ significantly between groups (see Table 2).

Findings confirmed that patients received inadequate analgesia (19.89 ± 13.37 mg morphine equivalents/24 hours) despite unrelieved pain (6.63 ± 2.46 , 0–10 scale) on days 2 to 3 after surgery. No significant differences using ANOVA-RM were evident between groups for analgesics prescribed or administered at days 3 or 5, probably because of

large standard deviations and small sample size (see Table 2). However, patients receiving the preoperative education intervention received 46% more analgesia in the previous 24 hours at day 3 and 33% more at day 5, compared with the control group. For all patients, the average analgesic dose prescribed in the previous 24 hours using morphine equivalents was closer to the therapeutic range of 50–60 mg/24h at both day 3 [M(SD) = 48.91(16.97) mg] and day 5 [M = 49.60(16.50) mg] than in our previous study [day 3: 33(24) mg].

Table 2 Analgesia and Pain Ratings			
Outcome	Control M(SD)	Treatment A Control + Booklet M(SD)	Treatment B Control + Booklet + Interview M(SD)
Analgesic administration* (morphine equivalents mg/24h)	T ₂ 15.63 mg (12.89)	25 mg (12.67)	20.71 mg (13.83)
	T ₃ 13.13 mg (11.31)	18.92 mg (16.82)	16.79 mg (10.36)
Pain (Present Pain Intensity)	T ₂ 2.35 (1.15)	2.14 (0.86)	2.75 (1.13)
	T ₃ 2.44 (1.36)	2.15 (0.99)	2.25 (0.77)
* differences not significant			

No significant differences were evident between groups for interference in activities because of pain (POQ-BPI) (see Table 3). However, within-intervention group changes were evident with a statistically significant decrease in pain-related interference in activities between days 3 and 5 [$t(df15) = 2.92, p < 0.01$]. Significant decreases were evident, particularly in interference with general activity [$t(15) = 2.9, p < 0.01$], walking [$t(15) = 2.88, p < 0.01$], and deep breathing and coughing [$t(15) = 2.85, p < 0.01$]. Despite these changes, no differences in pain ratings were evident, possibly because of lack of statistical power.

Patients' concerns about asking for help and taking analgesia (POQ-BQ) were significantly reduced at day 5 in the intervention

versus control group ($F_{2,42} = 4.17, p < 0.02$) and tended to be less on day 3 ($F_{2,43} = 2.90, p < 0.07$) (Table 3). As well, a statistically significant decline in concern scores was evident for both intervention groups between baseline and day 5 after surgery. Moreover, the intervention groups showed a significant decrease in concerns about addiction ($F_{2,42} = 6.583, p < 0.003$) and asked for more help with severe pain ($F_{2,42} = 4.72, p < 0.02$). Also, patients in the intervention groups tended to be more satisfied with their pain treatment ($F_{2,40} = 2.96, p < 0.06$).

Table 3 *Interference and Concerns*

Outcome		Control M(SD)	Treatment A Control + Booklet M(SD)	Treatment B Control + Booklet + Interview M(SD)
<i>Interference (POQ-BPI)^a</i> (0–60)				
	T ₂	23.06 (11.30)	27.62 (11.98)	31.36 (8.48)
	T ₃	18.94 (13.54)	19.83 (10.20)	22.86 (10.70)
<i>Concerns (POQ-BQ)^b</i> Total Scores (0–70)				
	T ₁	21.25 (13.34)	21.88 (14.86)	26.14 (11.07)
	T ₂	22.31 (11.22)	16.23 (11.96)	14.21 (11.16)
	T ₃	18.56 (12.51)	14.92 (13.10)	8.64 (7.46)**
Addiction Fear (0–10)				
	T ₁	3.63 (3.65)	3.35 (3.69)	6.00 (3.43)
	T ₂	3.50 (3.79)	3.21 (3.60)	2.88 (3.56)
	T ₃	3.56 (3.58)	2.92 (3.77)	1.69 (2.50)**
<p>* differences not significant ** $p < 0.05$ ^a Patient Outcome Questionnaire – Brief Pain Inventory ^b Patient Outcome Questionnaire – Barriers Questionnaire</p>				

Discussion

This pilot study with 45 patients found that analgesic administration is inadequate, similar to the results of our previous study (Watt-Watson et al., in press). While pain ratings and analgesia were not statistically different, the greater analgesia received by the intervention groups versus the control group was clinically significant in the previous 24 hours at days 3 and 5. These results support the hypothesis that patients receive-

ing the booklet would receive more adequate analgesia. The lack of statistical significance in both these outcomes may be related to the small numbers and large standard deviations.

The intervention groups had fewer concerns about asking for help and less fear of addiction than the control group. An additional rating about pain "on average" may be helpful with these patients and has been added in our current study. More than 5 days may be needed to show changes in pain; telephone follow-up after discharge is being used in our current project.

Only minimal changes were required in the RCT manoeuvre; as no significant differences between the two intervention groups (booklet vs. booklet plus interview) were demonstrated, only the booklet group with a brief explanation will be retained. No changes were required in the intervention booklet or measures. Most CABG patients and families read the entire booklet and rated it as helpful.

In conclusion, all patients in this pilot study were experiencing moderate to severe pain and receiving inadequate analgesia, similar to those in our previous study. However, changes were evident in the intervention groups related to addiction concerns and seeking help with pain, despite the small sample size. Clinically significant increases in analgesic administration were also evident for the intervention groups. Therefore, this area warrants further investigation. A larger RCT is now in progress, supported by the Heart and Stroke Foundation of Ontario.

References

- Agency for Health Care Policy and Research. (1992). *Acute pain management: Operative or medical procedures and trauma*. Rockville, MD: US Department of Health and Human Services.
- American Pain Society Quality of Care Committee. (1995). Quality improvement guidelines for the treatment of acute and cancer pain. *Journal of the American Medical Association*, 274, 1874-1880.
- Anderson, E. (1987). Preoperative preparation for cardiac surgery facilitates recovery, reduces psychological distress, and reduces the incidence of acute postoperative hypertension. *Consulting Clinical Psychology*, 55, 513-520.
- Beggs, V., et al. (1998). Patient education for discharge after coronary bypass surgery in the 1990s: Are patients adequately prepared? *Journal of Cardiovascular Nursing*, 12, 72-86.
- Christopherson, B., & Pfeiffer, C. (1980). Varying the timing of information to alter preoperative anxiety and postoperative recovery in cardiac surgery patients. *Heart and Lung*, 9, 854-861.

- Close, S. (1990). An exploratory analysis of nurses' provision of postoperative analgesic drugs. *Journal of Advanced Nursing*, 15, 42-49.
- Cohen A., Moore, P., Jones, C., Miner, T., Carter, W., Zurcher, R., Lupkas, R., & Edwards, F. (1993). Effect of internal mammary harvest on postoperative pain and pulmonary function. *Annals of Thoracic Surgery*, 56, 1107-1109.
- Cupples, S. (1990). Effects of preadmission teaching on knowledge and postoperative recovery of coronary artery bypass graft patients. In S. Funk, E. Tornquist, M. Champagne, L. Copp, & R. Weise (Eds.), *Key aspects of recovery: Improving nutrition, rest, and mobility* (pp. 299-307). New York: Springer.
- Daut, R., & Cleeland, C. (1982). The prevalence of and severity of pain in cancer. *Cancer*, 50, 1913-1918.
- Daut, R., Cleeland, C., & Flanery, R. (1983). Development of the Wisconsin Brief Pain Questionnaire to assess pain in cancer and other diseases. *Pain*, 17, 197-210.
- Devine, E., & Cook, T. (1983). A meta-analytic analysis of effects of psychoeducational interventions on length of postsurgical hospital stay. *Nursing Research*, 32(4), 267-274.
- Donovan, M., Dillon, P., & McGuire, L. (1987). Incidence and characteristics of pain in a sample of medical-surgical inpatients. *Pain*, 30, 69-78.
- Dudgeon, D., Raubertas, R., & Rosenthal, S. (1993). The short-form of the McGill Pain Questionnaire in chronic cancer pain. *Journal of Pain and Symptom Management*, 8, 191-195.
- Faherty, B., & Grier, M. (1984). Analgesic medication for elderly people post-surgery. *Nursing Research*, 33(6), 369-372.
- Goodman, H. (1997). Patients' perceptions of their education needs in the first six weeks following discharge after cardiac surgery. *Journal of Advanced Nursing*, 25, 1241-1251.
- Gracely, R., McGrath, P., & Dubner, R. (1978). Ration scales of sensory and affective verbal pain descriptors. *Pain*, 5, 5-18.
- Hathaway, D. (1986). Effect of postoperative instruction on postoperative outcomes: A meta-analysis. *Nursing Research*, 35, 269-275.
- Heart and Stroke Foundation of Toronto. (1996). *Facts by fax: Costs of heart disease and stroke* (Document #15009). Toronto: Author.
- Johnson, J., Fuller, S., Endress, P., & Rice, V. (1978). Altering patients' responses to surgery: An extension and replication. *Research in Nursing and Health*, 1, 111-121.
- Maxam-Moore, V., Wilkie, D., & Woods, S. (1994). Analgesics for cardiac surgery patients in critical care: Describing current practice. *American Journal of Critical Care*, 3, 31-39.
- Melzack, R. (1987). The short-form McGill Pain Questionnaire. *Pain*, 30, 191-197.
- Moore, S. (1997). Effects of interventions to promote recovery in coronary artery bypass surgical patients. *Journal of Cardiovascular Nursing*, 12(1), 59-70.
- Mullen, P., Mains, D., & Velez, R. (1992). A meta-analysis of controlled trials of cardiac patient education. *Patient Education and Counselling*, 19, 143-162.

- Newell, D. (1992). Intention-to-treat analysis: Implications for quantitative and qualitative research. *International Journal of Epidemiology*, 21, 837-841.
- Norman, G., & Streiner, D. (1994). *Biostatistics: The bare essentials*. St. Louis: Mosby.
- Owen, H., McMillan, V., & Rogowski, D. (1990). Postoperative pain therapy: A survey of patients' expectations and their experiences. *Pain*, 41, 303-307.
- Paice, J., Mahon, S., & Faut-Callahan, M. (1991). Factors associated with adequate pain control in hospitalized postsurgical patients diagnosed with cancer. *Cancer Nursing*, 14(6), 298-305.
- Puntillo, K. (1990). Pain experiences of intensive care unit patients. *Heart and Lung*, 19, 526-533.
- Puntillo, K., & Weiss, S. (1994). Pain: Its mediators and associated morbidity in critically ill cardiovascular surgical patients. *Nursing Research*, 43(1), 31-36.
- Redeker, N. (1993). Symptoms reported by older and middle-aged adults after coronary bypass surgery. *Clinical Nursing Research*, 2(2), 148-159.
- Reeder, B., Chockalingam, A., Dagenais, G., MacLean, D., Mao, Y., Nair, C., Petrasovits, A., Shuaib, A., Wielgosz, A., & Wilson, E. (1995). *Heart disease and stroke in Canada*. Ottawa: Heart and Stroke Foundation of Canada.
- Reisine, T., & Pasternak, G. (1996). Opioid analgesics and antagonists. In J. Hardman, L. Limbard, P. Molinoff, R. Ruddon, & A. Gilman (Eds.), *Goodman & Gilman's pharmacological basis of therapeutics*, 9th Ed. (pp. 521-556). New York: McGraw-Hill.
- Rice, V., Mullin, M., & Jarosz, P. (1992). Preadmission self-instruction effects on postadmission and postoperative indicators in CABG patients: Partial replication and extension. *Nursing in Research and Health*, 15, 253-259.
- Schindler, B., Shook, D., & Schwartz, G. (1989). Beneficial effects of psychiatric intervention on recovery after coronary bypass graft surgery. *General Hospital Psychiatry*, 11, 358-364.
- Serlin, R., Mendoza, T., Nakamura, Y., Edwards, K., & Cleeland, C. (1995). When is cancer mild, moderate or severe? Grading pain severity by its interference with function. *Pain*, 61, 277-284.
- Ward, S., Goldberg, N., Miller-McCauley, V., Mueller, C., Nolan, A., Pawlik-Plank, D., Robbins, A., Stormoen, D., & Weissman, D. (1993). Patient-related barriers to management of cancer pain. *Pain*, 52, 319-324.
- Ware, J., & Hays, R. (1988). Methods for measuring patient satisfaction with specific medical encounters. *Medical care*, 26, 393-402.
- Ware, J., Snyder, M., Wright, W., & Davies, A. (1983). Defining and measuring patient satisfaction with care. *Evaluation of Program Planning*, 6, 247-263.
- Watt-Watson, J., Clark, A.J., Finley, A., & Watson, C.P.N. (1999). Canadian Pain Society position statement on pain relief. *Pain Research and Management*, 4(2), 75-78.
- Watt-Watson, J., Garfinkel, P., Gallop, R., Stevens, B., & Streiner, D. (in press). The impact of nurses' empathic responses on patients' pain management in acute care. *Nursing Research*.

- Watt-Watson, J., & Graydon, J. (1995). Impact of surgery on head and neck cancer patients and their caregivers. *Nursing Clinics of North America*, 30(4), 659-671.
- Wilder-Smith, C., & Schuler, L. (1992). Postoperative analgesia: Pain by choice? The influence of patient attitudes and patient education. *Pain*, 50, 257-262.
- Winefield, H., Katsikitis, M., Hart, L., & Rounsefell, B. (1990). Postoperative pain experiences: Relevant patient and staff attitudes. *Journal of Psychosomatic Research*, 34, 543-552.

Authors' Note

The authors are indebted to all the patients who participated in this study.

Comments or queries should be directed to Judy Watt-Watson, Faculty of Nursing, University of Toronto, 50 St. George Street, Toronto ON M5S 3H4 Canada. Telephone: 416-978-2850. Fax: 416-978-8222. Email: <j.watt.watson@utoronto.ca>.