

**Title: A Multi-Modal Approach to Pain Management Following Total Joint Replacement Surgery With The local anaesthetic infusion pump system a Prospective, historical control Study.**

**Patricia J Ford<sup>1</sup> BSN ONC, Ralph T Salvagno<sup>1</sup> MD, Thomas Pianta<sup>1</sup> MPT, Alan Dine<sup>2</sup>  
<sup>1</sup>Center for Joint Replacement Washington County Hospital, Hagerstown, MD  
<sup>2</sup>I-Flow Corporation**

**Purpose:** In 1997, we designed a multidisciplinary “Total Joint Program,” including a team approach to care, a rehabilitation model, and patient and caregiver education, which has been very successful in improving outcomes and patient satisfaction. In 2001, we implemented a multi-modal approach to postoperative pain management in this population, including the administration of Bupivacaine with a local anaesthetic infusion pump pain relief system at the site of the pain stimulus, and pre-and post-operative use of COX 2 inhibitors. This process has minimized potential side effects from high doses of any single agent.

**Conceptual Framework:**

**Hypothesis:** : Continuous low-dose infiltration of a local anesthetic with the local anaesthetic infusion pump pain pump into the postoperative wound incision for a 48 hour period would:

- 1) Diminish the need for narcotics or other analgesia,
- 2) Decrease postoperative pain,
- 3) Enhance/speed recovery by decreasing or eliminating adverse effects associated with narcotic use.

**Design:** Historical comparison (chart review) between patients prior to the program’s implementation and utilization of the local anaesthetic infusion pump system; and self-reported symptoms post-operatively.

**Subjects:** 36 total hip and total knee arthroplasty patients of a single surgeon (RTS).

**Intervention:**

- 1) The Center for Joint Replacement at Washington County Hospital:
  1. Orthopedic Care Specialist assigned to patients across the continuum
  2. Extensive pre-operative database obtained on patients
  3. Dedicated staff with limited number of caregivers across the continuum
  4. Pre-operative education and exercise training
  5. Inclusion of “Coach” in education and rehabilitation sessions
  6. Physician order sets and written clinical pathway, including pre-planned admission dates, times and LOS
  7. Pre and post-operative use of COX 2 inhibitors for pain control
- 2) Local anaesthetic infusion pump

**Method and Data Analysis:** Data was collected on thirty-six (16) total hip replacement (THR) and twenty (20) total knee replacement (TKR) patients post-operatively consisting of daily pain scores, additional pain medication delivered to the patient to manage postoperative pain, and any side effects secondary to these medications. Bowel and bladder function, ambulation, AROM, ability to participate in physical and occupational therapy, and hospital length of stay were

In parallel, a retrospective review of patient records for this data was performed. This review covered 7 years (1996-one year prior to start of “Total Joint Program” through 2002 inclusive). Thirty (30) patients were randomly selected from each year for review.

**Findings:** There was a dramatic reduction in both side effect (nausea/vomiting) and mean opioid use during hospitalization between the historical group and the multimodal group. Mean opioid use decreased from 184 mg to 22 mg ( $p<.05$ ) Fig 1. Mean days of n/v decreased from 2.2 to 0.2 days( $p<.05$ ) Fig 2. Combined length of stay for both procedures is at 2.97 days. With the use of local anaesthetic infusion pump, we have eliminated the use of PCA for our total joint patients.

**Conclusion:** A comprehensive care program for THR and TKR patients, in combination with a multi-modal pain management system is a safe and effective method of improving postoperative pain management and improving outcomes in this population. LOS, pain control, side effect profiles, and patient functionality all improved dramatically in the program when including the p local anaesthetic infusion pump.

**Implications for Orthopedic Nursing Practice:** Due to improved patient preparation and education regarding surgery, as well as decreased pain control side effects:

1. Post-operative nursing care requirements decreased
2. Patient mobilization expedited
3. Length of Stay decreased
4. Patient satisfaction improved

Fig 1: Mean opioid use during hospitalization

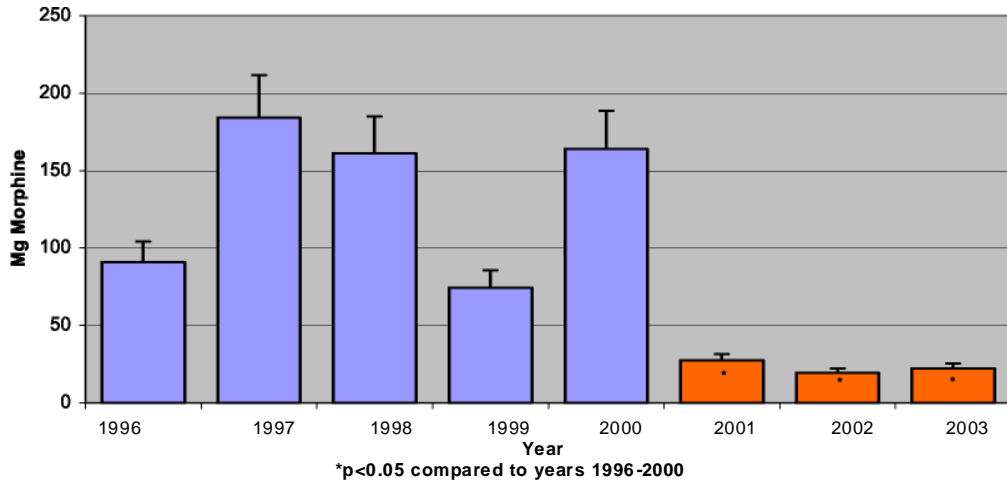


Fig 2: Nausea Vomiting

