

## **A Retrospective Study on Common Practices in Post-operative Pain Assessment and Control Among Adult Patients Who Underwent Major/Medium Surgeries at the Cebu Velez General Hospital, January to June 2014**

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**Objective:** To describe common practices in pain assessment and control of surgery patients at Cebu Velez General Hospital (CVGH).

**Methods:** Records of adult patients admitted to the Department of Surgery within January to June 2014 were reviewed. Data collected were method of pain monitoring, pain scores and analgesics given on admission, operation done, pain within and beyond 24 hours post-operatively, analgesics given 24 hours post-operatively, and upon discharge.

**Results:** A total of 176 operations were included in this survey. Fifty one percent of the operations were under general surgery. Pain monitoring was done by the surgical clerks. Not one chart had pain monitoring documented in the vital signs monitoring sheets. Thirty two percent had no pain assessment on admission. Among those with pain assessment on admission, 60.5% suffered from significant pain. Tramadol was the most frequent parenteral analgesics given at 80% on admission as well as postoperatively and upon discharge. Tramadol+paracetamol combination was the most prescribed oral analgesics post-operatively. Within 24 hours after surgery, 40.9% of patients had no recorded pain assessments. Half of those patients assessed suffered from significant pain while still in the hospital. Beyond 24 hours post-op, 47.7% had no documented pain assessment. Almost a third of the patients assessed for pain had significant pain.

**Conclusion:** Postoperative pain assessment and control have been poorly addressed among surgical patients from admission to discharge. Tramadol was the most commonly utilized analgesic whether parenteral, oral, monotherapy or in combination with a non-opioid analgesic.

**Key words:** Postoperative pain, pain assessment, tramadol

*Primum non nocere* - first, do no harm - this principle of bioethics has been taught to health professionals in

medical schools. But for surgeons, inflicting pain through surgical incisions is the most common principal step in providing treatment and cure to patients referred to them. It is thus the surgeon's duty to alleviate or lessen the harm they inflict on the patient by managing the post-operative pain judiciously.

Pain is a subjective symptom; there is no exact way to measure pain, and health professionals can only ask the patient to describe and rate the pain they are experiencing with the use of a pain scale. This simple means of communicating pain intensity, however, can pose a challenge for many surgeons. Despite the advocacy of pain as the 5th vital sign, many of the health professionals undermanage pain, causing stress and unnecessary anxiety to the surgical patients. Adequacy of pain management is one of the indicators of the quality of health care provided with predictive consequences for good patient outcomes and satisfaction. Pain should therefore be monitored and controlled adequately to prevent the patients from experiencing an unpleasant hospital stay. Thus, in December 2012, the hospital's nursing service included pain as an item to be monitored in the vital signs monitoring sheet.

This study was conducted to make a primary assessment of common practices in pain monitoring and control among adult patients operated at the CVGH. This will serve as a baseline data, and the results may be utilized in reassessing and improving

the postoperative pain management of future patients.

## Methods

Using the census of operations of the Department of Surgery as a sample frame, all the available records of adult patients admitted whether primary or referral to the Department of Surgery, Cebu Velez General Hospital and underwent major or medium surgery (the Philippine Society of General Surgeons Accreditation Manual in General Surgery) from January 2014 to June 2014 were reviewed.<sup>1</sup> Data pertinent to the objectives of the study were abstracted. These included patient demographics, method of pain score monitoring, pain score on admission, analgesics given on admission, operation done, analgesics given 24 hours post-operatively, pain score within 24 hours post-operatively, pain score beyond 24 hours post-operatively, and analgesics given upon discharge. The exclusion criteria for this study were: 1) pediatric patients - patients below 14 years old, 2) patients who could not verbalize pain, 3) patients who expired during the admission, 4) patient who underwent minor operation, and 5) patient referred to the Department of Surgery as an intra-operative referral. The frequency distribution of all pertinent data gathered were tabulated and analyzed.

Operational definitions pertinent to this study included the following: 1) significant pain - moderate to severe pain with pain scale range of 4 to 10; 2) worst case scenario - traditionally imputes the worst response observed among the active treatment group for those missing values within the active treatment group, and the best observed response among the placebo group for those missing values within the placebo group.<sup>2</sup> In this particular study, worst case scenario means that the worst outcome happened to those who were not assessed for pain status - that they suffered from pain. 3) surgical senior clerk - a 4th year medical student who has undergone pain assessment and pain control module during the 3rd year junior clerkship.

## Results

A total of 176 operations were included in this survey. Among patients operated, there were 50% males and 50% females with a mean age of 44 years (range 14 to 91). Fifty one percent of the operations were under general surgery service followed by orthopedics. (Table 1) All pain score monitoring done while the patient was under hospital care was performed by the surgical senior clerks once daily and documented in their progress notes. Not a single chart had pain score monitoring documented in the vital signs monitoring sheets. Among these patients, 57 (32.4%) had no pain assessment on admission. Among those with pain assessment on admission, 72 (60.5%) suffered from significant pain. (Table 2) In the worst case scenario which presumes that those not assessed suffered from pain, 76.1% of all patients could have suffered pain. (Table 3) Tramadol was the most frequent parenteral analgesics given to 80% of patients on admission, while etoricoxib and tramadol+paracetamol combination oral analgesics were commonly given at 39.3% and 32.1% respectively. (Table 4) One patient in severe pain (10/10 pain scale) due to disseminated cancer (Non-Hodgkin's lymphoma) was given morphine 1mg intravenously as a single dose.

Postoperatively, tramadol was the most frequently prescribed parenteral analgesic (55.4%) while tramadol+paracetamol combination was the most commonly prescribed oral analgesics at 52.5%. (Table 5) Within 24 hours after surgery, 72 patients (40.9%) had no recorded pain assessments. Half of those patients (52/104) assessed suffered from significant pain while still in the hospital and under medical care. (Table 6) In the worst case scenario, 84% of patients would have suffered from pain. (Table 7) Three patients who underwent orthopedic surgery were subjected to spinal-epidural analgesia postoperatively.

Beyond 24 hours post-op, almost a third of the patients assessed had significant pain. Eighty four patients (47.7%) had no documented pain assessment and in the worst case scenario, 78% would have been in pain. (Table 8 & 9) Upon discharge, tramadol +paracetamol analgesic combination was the most frequently used at 29% followed by paracetamol at 27.3%. (Table 10)

## Discussion

The process of post-operative pain assessment is ongoing. Patients should be reassessed at frequent intervals (not less than every 2 to 4 hours for the first 24 hours) to determine the efficacy of the intervention in reducing pain. Ongoing reassessment ensures satisfactory pain relief with the most appropriate balance of drug and non-

drug strategies.<sup>3</sup> In this study, pain was not assessed on admission in 32.4% of the patients, 40.9% were not assessed 24-hours postoperatively, and 47.7% were not assessed beyond the 24-hour period. The primary aim of postoperative pain relief is to provide subjective comfort and inhibit trauma-induced nociceptive impulses, thereby blunting autonomic and somatic reflex responses. Despite major improvements in pain assessment and management,

**Table 1.** Frequency distribution of surgery classification by service.

Classification	No.	Percentage
General Surgery	90	51.1%
Appendix	25	27.8%
Gastric/Small intestine/Colon/Anus	18	20.0%
Hepatobiliary	17	18.9%
Breast	13	14.4%
Head and Neck	9	10.0%
Hernia	8	8.9%
Orthopedics	42	23.9%
TCVS	27	5.3%
ENT	11	6.3%
Urosurgery	4	2.3%
Neurosurgery	1	0.6%
Plastic and Reconstructive Surgery	1	0.6%
Total	176	100%

**Table 2.** Frequency distribution of pain assessment on admission.

Pain Scale	No.	Percentage
No pain	42	35.3%
Mild Pain (PS < 3)	5	4.2%
Moderate Pain (PS 4-6)	24	20.2%
Severe Pain (PS 7-10)	48	40.3%
Total	119	100%

**Table 3.** Frequency distribution of pain on admission (worst case scenario).

Pain Scale	No.	Percentage
No Pain	42	23.9%
In Pain	134	76.1%
Total	176	100%

**Table 4.** Frequency distribution of pain medications given on admission.

	Dosage	Route	Frequency	No.	Percentage
Parenteral Medication				n = 20	41.7%
Tramadol	50mg	IVTT	q6-8h	16	80.0%
Ketorolac	30mg	IVTT	q8h	2	10.0%
Morphine	1mg	IVTT	single dose	1	5.0%
Paracetamol	300mg	IVTT	q6h	1	5.0%
Oral Medication				n = 28	58.3%
Etoricoxib	120mg	PO	OD	11	39.3%
Tramadol + Paracetamol	37.5/325mg	PO	q6-8h	9	32.1%
Celecoxib	400mg	PO	OD	3	10.7%
	200mg	PO	OD	2	7.1%
Paracetamol	500mg	PO	q4h	2	7.1%
Mefenamic Acid	500mg	PO	q8h	1	3.5%
Total				n = 48	100%

**Table 5.** Frequency distribution of highest pain score within 24hrs post-op.

Pain Scale	No.	Percentage
No pain	28	26.9%
Mild Pain	24	23.1%
Moderate Pain	28	26.9%
Severe Pain	24	23.1%
Total	104	100%

**Table 6.** Frequency distribution of highest pain score within 24hrs post-op (worst case scenario).

Pain Scale	No.	Percentage
No Pain	28	15.9%
In Pain	148	84.1%
Total	176	100%

**Table 7.** Frequency distribution of pain medications given post-op.

	Dosage	Route	Frequency	No.	Percentage
Parenteral Medication				166	57.4%
Tramadol	50mg	IVTT	q6-8h	92	55.4%
Parecoxib	40mg	IVTT	q12h	29	17.5%
Nalbuphine	5mg	IVTT	q4-6h	20	12.0%
Ketorolac	30mg	IVTT	q8h	18	10.8%
Oxycodone	5mg	IVTT	q6h	4	2.4%
Paracetamol	300mg	IVTT	q6h	2	1.2%
	450mg	IVTT	q6h	1	0.6%
Epidural Medication				3	1.0%
Sensorcaine + Nubain	5-10cc	epidural	q4-6h	3	100%
Oral Medication				120	41.5%
Tramadol + Paracetamol	37.5/325mg	PO	q6-8h	63	52.5%
Etoricoxib	120mg	PO	OD	41	34.2%
Celecoxib	400mg	PO	OD	5	4.2%
	200mg	PO	OD	3	2.5%
Tramadol	50mg	PO	TID	2	1.7%
Ibuprofen	400mg	PO	BID	2	1.7%
Mefenamic Acid	500mg	PO	TID	2	1.7%
Meloxicam	15mg	PO	OD	1	0.8%
Ibuprofen	200mg	PO	BID	1	0.8%
Total				289	100%

**Table 8.** Frequency distribution of highest pain score beyond 24hrs post-op.

Pain Scale	No.	Percentage
No pain	39	42.4%
Mild Pain	24	26.1%
Moderate Pain	23	25.0%
Severe Pain	6	6.5%
Total	92	100%

**Table 9.** Frequency distribution of highest pain score beyond 24hrs post-op (worst case scenario).

Pain Scale	No.	Percentage
No Pain	39	22.2%
In Pain	137	77.8%
Total	176	100%

**Table 10.** Frequency distribution of prescribed oral pain medications on discharge.

Medication	Dosage	Frequency	No.	Percentage
Tramadol + Paracetamol	37.5/325mg	q6-8h	50	29.1%
Paracetamol	500mg	q4-6h	47	27.3%
Etoricoxib	120mg	OD	36	20.9%
Celecoxib	200mg	BID	15	8.7%
Etoricoxib	60mg	BID	7	4.1%
Tramadol	50mg	TID	6	3.5%
Mefenamic Acid	500mg	TID	4	2.3%
Morphine	10mg	q8h	1	0.6%
Oxycodone + Naloxone	10/5mg	q12h	1	0.6%
Celecoxib	400mg	OD	1	0.6%
Meloxicam	15mg	OD	1	0.6%
Dexketoprophen	25mg	q8h	1	0.6%
Diclofenac	50mg	BID	1	0.6%
Ibuprofen	400mg	TID	1	0.6%
Total			172	100%

postoperative patients often experience moderate to severe pain, and worst pain episodes occur even in the late postoperative phase.<sup>4</sup> This current study showed a similar pattern to previous studies, where pain is indeed not assessed adequately, and the patients consequently receive inadequate pain relief.<sup>4-6</sup> A national survey on postoperative pain management conducted in France in 2007 showed that they had a significant improvement in postoperative pain management since the implementation of its regular evaluation of pain score and its reporting in the patients file. It was suggested that educating the nurses about pain and daily pain assessment with a numerical rating scale can improve the communication, assessment and documentation of patient's pain and improve analgesic administration by nurses.<sup>5</sup> Despite the directive that nursing should routinely include pain score assessment on admission and subsequent monitoring, the inadequate pain assessment in our institution as documented in this study should therefore warrant a deeper study to explain the discrepancy, and interventions may be necessary to improve the pain management of the postoperative patients and improve the quality of patient care, thereby providing a more pleasant hospital stay for the patients.

In 1993, a similar survey on postoperative pain has been conducted at Chong Hua Hospital in Cebu City and the authors found that practically all patients did not experience pain relief during the first 24 hours following surgery. This was attributed to the practice of prescribing a fixed dose of analgesics without providing for rescue doses or dose escalation based on adequacy of pain relief.<sup>7</sup> In the current study, it was found that there was no documentation of pain relief or effect of the analgesics given. Despite the presence of a pain score grid in the vital signs monitoring sheet of the patients' chart, the nurses did not plot the pain scores of the patients. A survey conducted by Oates, et al. showed that the most commonly perceived reason for failure to administer prescribed analgesics was that patients did not ask for pain relief, among others. The nursing staff was found to rely on patients taking the initiative in requesting pain relief. They concluded that regular recording of pain scores alongside other routine observations may overcome the current communication difficulty between patient and hospital staff.<sup>8</sup> A study by de Rond, et al. also showed that nurses do not systematically ask the patients about their pain, and patients seem to be reluctant to talk about their pain or to ask for pain medication. If nurses

do not assess or evaluate their patients' pain in a systematic way, then they must rely on their observational skills to recognize patients' pain. Poor communication and assessment frequently results in poor documentation. They concluded that communication between patients and nurses about pain is inadequate, nurses' assessment of patients' pain is inaccurate, and documentation of pain in nursing records is incomplete and inaccurate.<sup>9</sup> The importance of pain monitoring by nurses was further emphasized by the study conducted by Chung, et al. which showed that the overall pain measurement assessed by nurses had an acceptable correlation with that assessed by patients and that pain intensity most reliably reflected patients' self-reports among the pain indices assessed by nurses as a potential predictor.<sup>10</sup> Pain monitoring and documentation is therefore an essential part of the patient care to be provided especially for postoperative patients, but this has not been implemented in the institution.

This therefore leads to the importance of the advocacy in implementing pain as a 5th vital sign. In a study conducted at the Department of General Surgery, Vicente Sotto Memorial Medical Center (VSMMC) in Cebu City in 2006, where the post-operative pain scores of surgical patients were monitored every eight hours throughout the patient's hospitalization up to discharge and were documented on a newly designed monitoring sheet of VSMMC with pain as the 5th vital sign, results showed that there was a significant reduction of pain from admission to discharge because patients were intervened appropriately of their respective symptoms by using proactive pain monitoring and providing analgesia using a protocolized analgesic regimen.<sup>11</sup> De Rond and colleagues also advocated the Pain Monitoring Program (PMP) for nurses. Pain Monitoring Program (PMP) for nurses have two components: educating nurses about pain, pain assessment and pain management; and implementing daily pain assessment by means of a numeric rating scale. The PMP proved to be effective in improving nurses' assessment of patients' pain and documentation about pain in nursing records. A simple method such as the numeric rating scale, together with an educating program, attention is focused systematically on patients' pain complaints and creates a common language between patients and nurses.<sup>9</sup> Mularski, et al.

though, conducted a retrospective study (cross-sectional medical record review) at the Veteran Affairs Medical Center to compare providers' pain management before and after implementing the initiative of measuring pain as the 5th vital sign, and performed a subgroup analysis of patients reporting substantial pain ( $\geq 4$ ) during a post-implementation visit. They then found that routine documentation of pain intensity, while necessary for quality care, may not be sufficient by itself to improve the quality of pain management. Pain evaluation and treatment remains an important focus for medical quality improvement. Additional interventions are needed to improve providers' awareness of patients' pain and to increase the rates at which they provide appropriate therapy.<sup>6</sup> Svensson, et al. stated that problems of postoperative pain management may consequently lie not in the development of new techniques but in developing an organization to exploit existing methods, routines, attitudes, and competence. The value of education, assessment, and a standardized prescription on the postoperative pain management routines has been stressed. Their study emphasized that in the clinical management of pain it is necessary to implement further quality assurance efforts, including routine assessment and documentation of pain intensity, and individual therapeutic goals for each individual patient.<sup>4</sup>

The results of this study showed that tramadol was the most frequently prescribed parenteral analgesic. Tramadol is a synthetic analogue of codeine, with low affinity for opioid receptors. Its mechanism of action is the inhibition of the neuronal uptake of norepinephrine and serotonin at synapses in the descending inhibitory pain pathways.<sup>12</sup> The determinants of analgesics to be used, its dosing and frequency, may depend on pain intensity, suspected underlying pathology, pain response to drug titration, and side effects. Sinha, et al. on their study on the efficacy of tramadol versus diclofenac in the management of post-laparoscopic cholecystectomy pain, found that tramadol was more efficacious in providing pain relief postoperatively.<sup>12</sup> They also stated that the choice of one over the other was more dependent on the surgeon than clear cut evidence. The possible preference of parenteral tramadol over other parenteral analgesics was stated in a study done in VSMMC on cancer pain. The authors stated that tramadol HCl was

a commonly utilized opioid analgesic due to the ease of prescription, since the physician does not need to have an S2 license or a Dangerous Drugs Board yellow prescription pad. The drug is readily available in various formulations, brands, and patients would rather take tramadol to avoid the addictive stigma of morphine.<sup>13</sup> Although tramadol HCl is also available in oral preparations as a single agent, this study showed that the combination of tramadol+paracetamol was more frequently prescribed than the single agent. This may be because combination analgesics may allow for lower doses of the individual agents, with doses possibly low enough to significantly reduce potential adverse events of each agent, such as constipation, nausea and vomiting, and gastrointestinal disturbances. Potential advantages of a fixed-dose tramadol+paracetamol, therefore, include broader analgesic spectrum, a complementary pharmacokinetic profile, potentially synergistic analgesic effect, greater convenience, and an improved ration of efficacy to adverse effects.<sup>14</sup>

## Conclusion

Postoperative pain assessment and control have been poorly addressed among surgical patients from admission to discharge. Tramadol was the most commonly utilized analgesic whether parenteral, oral, monotherapy or in combination with a non-opioid analgesic.

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