



**PAIN IN PATIENTS UNDERGOING ORTHOPEDIC SURGERY**  
**DOR EM PACIENTES SUBMETIDOS A CIRURGIAS ORTOPÉDICAS**  
**DOLOR EN PACIENTES SOMETIDOS A CIRUGÍA ORTOPÉDICA**

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**ABSTRACT**

**Objective:** to assess the level of pain in patients undergoing orthopedic surgery. **Method:** a quantitative approach, cross-sectional study conducted in 2009, in Uberlândia/MG, Brazil, where 20 patients were evaluated in the first 12 hours and later in the 12 hours following the postoperative period by means of a numerical scale to assess the level of pain. The project was approved by the Ethics in Research Committee Protocol 760/08. **Results:** it was observed that pain was present in 85% of subjects and there was a predominance of simple analgesics on prescription and a low rate of opioid use. **Conclusion:** pain treatment has already advanced strongly, but much remains to be done to treat it properly, especially with regard to the awareness of health professionals, particularly nursing staff, as they are the professionals who remain in direct contact with patients who will report pain. **Descriptors:** Pain, Vital Signs; Nursing; Orthopaedics; Surgery.

**RESUMO**

**Objetivo:** avaliar o nível de dor em pacientes submetidos a cirurgias ortopédicas. **Método:** estudo de abordagem quantitativa, de corte transversal, realizado em 2009, no município de Uberlândia/MG, Brasil, quando foram avaliados 20 pacientes nas primeiras 12h e posteriormente, nas 12h subsequentes ao período pós-operatório, por meio de uma escala numérica de avaliação do nível de dor. O projeto foi aprovado pelo Comitê de Ética em Pesquisa, Protocolo 760/08. **Resultados:** observou-se que a dor se fez presente em 85% dos sujeitos e que houve uma predominância na prescrição de analgésicos simples e um baixo índice de utilização de opióides. **Conclusão:** já se avançou bastante no tratamento da dor, mas muito ainda precisa ser feito para tratá-la adequadamente, principalmente no que diz respeito à conscientização dos profissionais de saúde, em especial a equipe de enfermagem, já que são os profissionais que permanecem em contato direto com os pacientes que vão referir dor. **Descritores:** Dor; Sinais Vitais; Enfermagem; Ortopedia; Cirurgia.

**RESUMEN**

**Objetivo:** evaluar el nivel de dolor en pacientes sometidos a cirugía ortopédica. **Método:** un enfoque cuantitativo, transversal, realizado en 2009, en Uberlândia/MG, Brasil, donde se evaluaron 20 pacientes en las primeras 12 horas, y después, en las 12 horas siguientes el postoperatorio por medio de una escala numérica para evaluar el nivel de dolor. El proyecto fue aprobado por el Comité de Ética en Investigación por medio del Protocolo 760/08. **Resultados:** se ha observado que el dolor estaba presente en 85% de los pacientes y se observó un predominio de los analgésicos simples de prescripción y una baja tasa de consumo de opiáceos. **Conclusión:** ya realizado grandes progresos en el tratamiento del dolor, pero aún queda mucho por hacer para tratar de forma adecuada, especialmente con respecto a la conciencia de los profesionales de la salud, en particular el personal de enfermería, ya que son los profesionales que se quedan en contacto directo con los pacientes se quejan de dolor. **Descriptor:** Dolor; Signos Vitales; Enfermería; Traumatología; Cirugía.

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## INTRODUCTION

Pain can be defined as a subjective and personal experience associated with actual or potential tissue damage. Its perception is characterized as a multidimensional experience, diverse in its quality and sensory intensity, being affected by affective-motivational variables.<sup>1</sup>

From pre-history, according to graphical prehistoric records, humans search for reasons to justify the occurrence of pain, as well as procedures for their control. It was attributed to evil spirits and punishment for misconduct; medicine was practiced by priests in the service of the gods, employing natural remedies and believing prayers had therapeutic effects. The religious concept of pain is based on classical medicine: *Divinunstest opus sedare dolorien* (sedating pain is a divine work). While for external causes treatment with medicines was generally very effective, for causes of internal pain divine forces were appealed to so that, through sacrifices or rituals, evil spirits were expelled.<sup>2</sup> Over the years of scientific evolution, pain treatment stopped being empirical and began to be performed in a scientific way, bringing relief and comfort to those who feel it.

Unrelieved acute pain can affect the respiratory, cardiovascular, gastrointestinal, endocrine and immune systems and can cause complications in patients, as well as suffering. The stress caused by intense pain triggers organic reactions with significant and particularly harmful negative effects in patients compromised by age, disease or injury. In general the stress response consists of metabolic changes and increased cardiac output, impaired response to insulin, increased risk of physiological disorders like heart attack, pulmonary infection, thrombo-embolism, and prolonged ileus.<sup>3</sup>

Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential injuries, or described in terms of such injuries. It is subjective and each individual learns to use this term through their experiences. The proposed definition demonstrates the multidimensionality of the experience and that both physical and emotional aspects must be evaluated.<sup>4</sup>

The process of treating pain is a constant challenge, as it involves the evaluation of the presence, type, intensity, location and possible causes, and the parameters of this assessment may change for each person.<sup>5</sup> It can be classified into acute and chronic. Acute pain is sudden onset, serving as a

warning of something wrong in the body, requiring some type of treatment or immediate intervention because there is generally an associated illness or organic injury, and lasts for a relatively short duration or until a foreseeable end. For this type of pain, there are associated neurovegetative responses, such as elevated blood pressure, tachycardia, tachypnea, sweating, anxiety and agitation. In chronic pain the duration pattern is different, as is the body's response to its association. It is undefined in time and space, persisting even without the presence of injury or after healing. It causes changes in the behaviour and lifestyle of the individual, resulting in loss of sleep, work, reasoning and memory, and their relationship with family and the world around them.<sup>6</sup>

There are further subdivisions for pain that aim to characterize its quality and location, among other factors:

Superficial somatic pain occurs when superficial structures of the body are affected by painful stimuli; it can be described as having a burning or stabbing quality and the individual is able to locate it quite accurately.

Deep somatic pain originates in the deeper structures of the body such as muscles, tendons, joints and fascia. It is usually described as a dull ache, stabbing, spasmodic, corrosive or piercing. Phantom pain arises by persistent painful sensation, i.e. there is persistence of pain memory even after the removal of its cause. Referred pain is that felt in a place away from the affected or injured area, although there is nervous connection between them. Neuropathic pain arises when there is partial or total lesion in the central or peripheral nervous pathways. It may result from injury or nerve compression through conditions such as diabetes, herpes zoster [shingles], strokes, tissue invasion by tumours, among others.<sup>6</sup>

Scales have been used to measure pain and some stand out for their ease of use. One of the most used is the Numeric Scale, on a range from 0-5 or 0-10, where zero means no pain, and five or ten the worst pain possible. In the Category Scale certain attributes are adopted to highlight the absence or presence of different degrees of pain - no pain, mild, moderate, severe, up to intolerable; the Visual Analogue Scale consists of a straight line of ten centimetres, whose opposite ends contained the words "no pain" and "worst pain imaginable", where the client indicates the place that they feel characterizes their pain; and Quantitative Non-Numeric Scales are used for the patient to identify the facial expressions of increasing suffering (adults and

children) or a sequence of filled cups (empty means no pain and full maximum pain).<sup>6</sup>

The control of postoperative pain and the relief of suffering are the responsibility and commitment of health professionals. Owing to lack of knowledge about effective doses, analgesic duration of action, analgesic techniques available, the fear of respiratory depression, among other factors, there are reports in the literature that pain is undertreated. The control of postoperative pain is essential to comprehensive patient care, since prolonged painful stimuli seem to predispose increased morbidity and complications in this period.<sup>4</sup>

Pain treatment is considered very important in patient care and the American Pain Society began to consider it the 5<sup>th</sup> vital sign, emphasizing its significance and looking to increase awareness among health professionals about the importance of its effective treatment.<sup>3</sup>

Several drugs are used to treat pain, aiming to control it with few side effects and reduced cost.

Drug selection must follow a scale of increasing complexity, magnitude and cost, while meeting the needs and tolerances of each individual. In pain pharmacotherapy the combined administration of various drugs is common in order to enhance the analgesic effects or minimize the unwanted side-effects that may arise. The most commonly used drug groups are: opioids, non-steroidal anti-inflammatory drugs (NSAIDs) and adjuvants.<sup>4</sup>

For postoperative pain control a multimodal approach is indicated that includes the use of pharmacological and non-pharmacological techniques. In the pharmacological treatment of pain, the use of NSAIDs plays an important role at central and peripheral levels. NSAIDs are indicated for mild or moderate pain, are safe and reduce the period of postoperative recovery.<sup>4</sup>

Opioids are used as analgesics, playing a significant role in postoperative pain by inhibiting the conduct of painful stimuli to more rostral (final) structures. They are indicated for medium and large intensity pain and their effect occurs by inhibiting the release of excitatory neurotransmitters in the central nervous system (CNS) and peripheral nervous system (PNS) and dopamine in the basal ganglia. They also activate the endogenous suppressor system and alter the cognitive and emotional processes related to the perception of pain. Adjuvant drugs are medications for therapeutic purposes other than analgesic, but result in such action when

they are part of the analgesic regimens; those that are in this group are anxiolytics, antidepressants, neuroleptics and anticonvulsants.<sup>4</sup>

Among the main non-pharmacologic techniques, there are physical therapies (application of heat and cold, massage, transcutaneous electrical nerve stimulation and acupuncture) that, through the activation of the sensory-discriminative system, stimulate the pain suppressant system and cognitive behavioural techniques (relaxation, distraction techniques, guided imagery, music therapy, hypnosis, among others) that, possibly, promote muscle relaxation, of attention and suggestion distraction and interfere with the analysis of postoperative painful stimuli.<sup>4</sup>

Pain control should be started immediately, together with propaedeutic measures, to identify its cause, provide relief and comfort to the patient and prevent possible complications of inadequate pain treatment.<sup>7</sup>

Pain is a very common symptom in the postoperative period, and its relief requires nursing staff to have knowledge of this symptom and dedication to the patient, and should consider all pain complaints as real. During the immediate postoperative period (IPP), the nursing process is geared to restoring the physiological balance of the patient, for the relief of pain and to prevent complications.<sup>3</sup> The IPP is understood as within the first 24 hours after anaesthesia-surgical procedure, including the period in the post-anaesthesia recovery room.<sup>8</sup>

At the hospital where we collected this study's data, pain was established as the 5<sup>th</sup> vital sign and its evaluation and measurement was performed by the nursing staff, who underwent a training period in August 2008. It must be stressed that the professional nursing staff remain in direct contact with the patient during the entire period of their hospitalization, working on a 24-hour shift rotation and the staff is composed by nurses, technicians and nursing assistants. Informally, we observed that the majority of patients undergoing orthopaedic and trauma surgeries had a postoperative period with pain.

In this light we realized the need to conduct a study to assess the pain reported by the patients in the IPP of orthopaedic and trauma surgeries. This study aimed to evaluate the level of pain in patients undergoing orthopaedic surgery.

It is hoped that such information enables the development of proposals that can

improve the quality of nursing care in reducing pain, providing comfort and well-being to the patient and subsequent postoperative recovery.

## METHOD

This article was extracted from course conclusion monograph << Evaluation and measurement of postoperative pain in orthopaedic and trauma surgery patients >> presented at the Federal University of Uberlândia, Uberlândia, 2009.

A quantitative, cross-sectional study developed through field research conducted in a university hospital in the city of Uberlandia (MG) Brazil. As an instrument of data collection, a specific card to evaluate pain was used. This instrument contained the following variables: age, sex, type of surgery, duration of surgery, type of anesthesia, pain medication prescribed per timeframe and, if necessary, time the surgery ended and patient's admission to the ward.

In order to reach the proposed aim, postoperative pain was evaluated using the same model used in the hospital studied, i.e. a numerical scale of 0 to 10, where 0 meant no pain; 1 to 3, weak pain; 4 to 6, moderate pain; 7-9, severe pain and 10 unbearable pain. This scale was applied to patients by the first author of this study.

Patients were interviewed about their pain in two stages: in the first 12 hours of the IPP (Moment 1) and in the subsequent 12 hours (Moment 2).

Because there are several sub-specialties in Orthopaedics and Traumatology, the surgeries for each are performed on different days of the week. So that we could evaluate all sub-specialties, the interviews were conducted on alternate days: one week on Monday, Wednesday and Friday and the following week on Tuesday and Thursday during the months of January and February 2009.

Table 1. Distribution of pain levels referred by patients hospitalized, at moments 1 and 2. Uberlândia - MG, Brazil. 2009 (n=20).

Pain Levels	Moment 1		Moment 2	
	n	%	n	%
No pain	06	30	05	25
Weak pain	04	20	06	30
Moderate pain	05	25	06	30
Intense pain	04	20	02	10
Unbearable pain	01	05	01	05
Total	20	100	20	100

The analgesics used during the IPP are presented in Table 2.

Used selection as criteria for patients were those aged between 18 and 60 years that had undergone orthopedic and trauma surgery. With these criteria applied, 20 patients participated in the study. They were informed about the study and were presented the Free and Informed Consent form in two copies, one of which remained with the individual subject and the other with the researchers.

The study began after the project was approved by the institution's Ethics Committee in Research, with the resolution nº 760/08. For this procedure the norms of the Ministry of Health's Resolution 196/96 were followed.<sup>9</sup>

## RESULTS

Os 20 pacientes foram submetidos a tratamento cirúrgico eletivo e internados na enfermaria de Clínica Cirúrgica. A maioria, 16 pacientes (80%) era do sexo masculino e quatro (20%) do feminino.

The 20 patients underwent elective surgical treatment and hospitalisation in the Clinical Surgery ward. The majority, 16 patients (80%) were male and four (20%) female.

With respect to age, eight (40%) were aged between 19 and 29 years, four (20%) between 30 and 39 years, four (20%) between 40 and 49 years and four (20%) between 50 and 59 years.

As for some characteristics of the surgery, it was found that with regard to the body places where it was performed, the greatest percentage corresponded to the lower limbs with nine cases (45%), followed by five spinal (25%), three hip cases (15%), upper limbs in two cases (ten%) and for the clavicle, one (5%).

Regarding the type of anaesthesia used, 55% of patients underwent spinal anaesthesia, which may be justified due to the majority of surgeries being on the lower limbs.

The evaluation of post-operative pain is demonstrated in the table 1.

Table 2. Distribution of analgesics used by 20 patients hospitalized in the immediate post-operative period. Uberlândia, MG, Brazil. 2009 (n=65).

Analgesics	Prescription with specific time	Prescription without specific time	Total	
	n	n	n	%
Metamizol	18	01	19	29.2
Tenoxicam	18	00	18	27.7
Tramadol Hydrochloride	18	03	21	32.3
Meperidine	01	01	02	3.1
Opioid	02	02	04	6.2
Paracetamol	01	00	01	1.5
<b>Total</b>	<b>58</b>	<b>07</b>	<b>65</b>	<b>100</b>

With regard to the analgesic treatment prescribed to patients, it was found that 18 of them (90%) received the same regimen, comprising metamizol, tramadol hydrochloride and tenoxicam, although they had undergone different types of orthopaedic surgery.

All medications prescribed conditionally “if necessary” (or without a specific time), were administered by nursing staff after the request of patients. Strong opioids, in the case of morphine sulphate and meperidine, were prescribed after medical evaluation due to patient complaints, and the presence of pain even with the administration of prescription drugs with a specific time.

## DISCUSSION

There was a significant number of males compared to females and 40% of the patients were aged between 19 and 29 years, which can be attributed to high frequency of accidents involving male victims.

This data agrees with the literature, which shows that the most frequent victims in traffic accidents are young people, especially males. This high incidence has been attributed to the very behaviours of the age group, which could lead them to break traffic laws and thus cause accidents.<sup>10</sup> It was also found that the remaining patients (60%) were adults in the productive phase of their lives, which coincides with research that studied the occurrence of thoracolumbar spinal fracture surgery in east São Paulo, where the average age was 38 years, ranging from 16 to 67 and all patients in the study were economically active.<sup>11</sup>

Motorcyclists are the main victims of traffic accidents, with rates above 40%. The most frequent injuries they have are skull fractures, internal thorax and abdomen injuries and leg fractures.<sup>12</sup>

Regarding the presence of pain, compared with the period of the first 12 hours after surgery, it was found that there was a decrease of those who were painless and of those with severe pain; the percentage of those with low and moderate pain increased; and the percentage of unbearable pain was

maintained. The sum of patients with moderate, intense and unbearable pain was 50% of the total at the first evaluation moment. At the second, adding the same categories made the total 45% of patients with complaints of medium and high intensity pain.

If on the one hand it is desirable to decrease intense pain and increase weak pain, the reduction of those who did not show any pain drew our attention, as well as the growth in those with moderate pain and the maintaining of pain considered unbearable, which is not expected to occur 12 hours after surgery.

According to the analgesic ladder for the pharmacological treatment of pain<sup>13</sup>, this would require a change of analgesic administration, with the introduction of an opioid. However, at the time of the second assessment only 15% of patients were receiving opioids for treating pain.

The use of strong opioids is usually low (15%), with a prevalence of simple analgesics (90%) such as dipyrone (metamizol), tenoxicam and weak opioids such as tramadol hydrochloride.<sup>14</sup>

A study in an emergency department of the Sergipe Emergency Hospital (SE) in 2011 evaluated the treatment of pain in 90 trauma victims. Regarding the type of treatment, 61.1% made use of analgesia, and non-steroidal anti-inflammatory drugs (NSAIDs) was the predominant class of analgesics used (30%), only 2.2% used weak opioids and no victim used strong opioids<sup>15</sup>, a factor that causes patients to remain in pain for longer.

Pain is subjective and clinical evaluation is difficult since not all patients report it when it begins. This fact suggests that it is necessary to develop appropriate instruments that enable the nursing team to make individual and group comparisons as to different therapeutic approaches, trying to minimize the subjective dimension of pain and<sup>16</sup>, concomitantly, the patient's suffering.

The knowledge of pain assessment scales is also an issue that needs to be discussed and implemented, for although there are implementing protocols in some units, there

are still professionals who are unaware of the existence of pain evaluation methods. A study was carried out among nursing professionals at the University of João Pessoa teaching hospital in 2010, with 21 professionals surveyed. When respondents were asked about their knowledge of an instrument for assessing pain, 14 (67%) mentioned that they did not know of any, including nurses and technicians; whereas 7 (33%) of the professionals said that they knew of a pain assessment instrument<sup>17</sup>, a factor that may contribute to the undervaluation of the same and consequently greater suffering to patients.

Opioids are the most potent analgesics, and therefore provide pain relief and well-being to the patient and it is believed that in the near future they will be more widely used for their beneficial effects. Today, their use is more restricted to medical pain specialists, neurologists and anaesthesiologists. Due to their potency, they are indicated for intense and moderate pain in the treatment of acute or chronic situations.<sup>18</sup>

There has been standardization by the studied hospital concerning the treatment of pain, not taking into account the individuality of each patient and the surgical procedure they have undergone. Therefore it seems clear that, besides the humanitarian aspect, the proper evaluation, control and relief of pain should be a vital part of nursing care contributing to the maintenance of basic physiological functions, avoiding harmful side effects arising from the persistence of pain.<sup>16</sup>

## CONCLUSION

Pain was present in 85% of the studied patients in the immediate post-operative period. Much progress has been made in the treatment of pain, but much remains to be done to control it, especially with regard to the awareness and preparation of health professionals.

Once scales are used to assess the pain of each patient, they cannot be treated in a universally standardized way. The measurement of clinical pain constitutes a great challenge to researchers and professionals, considering the subjectivity, complexity and multidimensionality of the pain experience.

The trauma arising from the operation involves physiological and emotional changes which, if not properly controlled, predispose patients to complications and may even prolong their hospital stay. Pain is one of the

conditions that can affect the individual's recovery.

Regarding the role of the nursing team that spends 24 hours daily with patients, pain management - specifically its evaluation, measurement and treatment - is crucial for the systematization of nursing care. The patient should be assessed from the preoperative period, checking for the existence of a pre-existing complaint that could exacerbate or bring complications to the post-surgery situation. A nursing team that is well prepared to deal with these patients will result in more effective care and better recovery.

The completion of this study brings to the nursing knowledge catalogue that another's pain, even with protocols that attempt to evaluate it, is subjective, and all complaints should be valued and observed with criteria specific for each patient, thus systematizing assistance.

It is important to note that as a study limitation is the standardization dynamic of painkillers for all types of surgeries, which may induce the nursing professional's to erroneously compare pain levels in those who underwent a procedure of greater or less complexity.

It is suggested that further studies be conducted in conjunction with multidisciplinary teams, taking into consideration the prescription of painkillers, the complexity of surgery and the individual's pain threshold.

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