

# The Oncological Pain – A Thorough Review of Medical Literature

Kameliya Tsvetanova<sup>1</sup>, Evelina Odiseeva<sup>2</sup>, Slavcho Tomov<sup>3</sup>, Todor Dimitrov<sup>4</sup>

<sup>1</sup>UMHAT "Dr. G.Stranski" Ltd.-city of Pleven, Clinic in Anaesthesiology and Intensive Care, Medical University – city of Pleven

<sup>2</sup>High Medical Academy –city of Sofia- Clinic in Anaesthesiology and Intensive Care

<sup>3,4</sup>UMHAT "Dr. G.Stranski" Ltd.-city of Pleven, Clinic in Oncology Gynecology, Medical University – city of Pleven

**Abstract:** *The goal of the present article is to be described some of the ways for cancer pain management on the grounds of the medical literary review done.*

**Keywords:** oncological pain, NSAID, opioid analgetics

## 1. Introduction

The post-operative pain is among the main reasons for the aggravated quality of life led by the sick persons suffering from oncological diseases. According to the International Association for the Study of Pain (year 1986), it represents „An unpleasant sense or emotional experience, associated with real or actual discomfort of tissues“ [1]. This definition expresses the interconnection between the objective, physiological aspects of pain sensation and its subjective, psychological components in addition to the activation of nociceptive pathways. [2].

The reaction to pain can differ not only with regard to individual people, but also with and at one and the same person, depending on the conditions in which it arises. It makes the struggle with it a quite difficult, costly and long-lasting task, because of which it quite often becomes necessary for the efforts of the medical specialists from different specialties to get united. [3].

## Components of pain

- Perceptual component (awareness and pain perception)
- Vegetative component
- Emotional component
- Behavioral component
- Motor component
- There is an anti-nociceptive component, which protects a human organism from harm and injury and conduces to pain alleviation.

The pain, felt by patients suffering from oncological diseases, can be due to the very tumor or to the therapy given, which one undergoes (radiation therapy, chemotherapy and so on.). In order to manage and relieve pain adequately, one must determine its intensity.

Some of the most commonly used methods by means of which one can explore pain are a Visual Analogue Scale (VAS), a digital graphic scale and others (Figure 1). They are one-dimensional, which means that they use only one dimension of pain, namely its intensity.

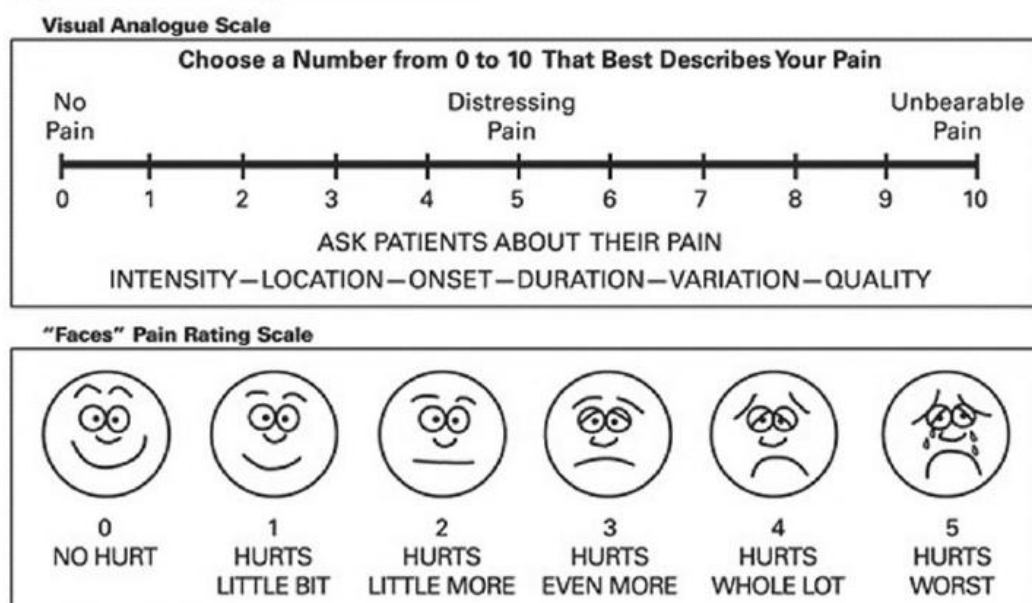


Figure 1: Scales assessing/rating pain intensity

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Whenever one assesses/rates in a many-sided manner cancer pain, then one most often uses the questionnaires of McGill, Brief Pain Inventory (BPI) and others.

The McGill Pain Questionnaire is a psychometric method, which is based on the use of different descriptive features of pain, as well as on its intensity.

Brief Pain Inventory (BPI) uses a digital scale, ranging from 0 up to 10. In this case, pain intensity is rated with a figure. Whenever pain intensity reaches the level 5, it begins to hinder to a great extent the daily work of patients and at the level 7 it excludes a sick person from social activity and makes one unfit to take care of oneself.

## 2. The pathophysiology of cancer pain

The diversity in the pathophysiology of a cancer pain is associated with: the infiltration of a tumor in different organs, nerve or vascular structures. Cancer pain can be subdivided as follows:

- **Nociceptive pain**

It arises as a result of the activation of nociceptors in somatic or visceral tissues. It can be classified in the following way: sharp, gripping, stabbing or pulsating.

- **Idiopathic pain**

It is usually of unclear origin.

- **Neuropathic pain**

A neuropathic pain is a result of a change in the physiological response of the neurons at the central nervous system and at the peripheral nervous system, due to stimulation or due to damage/injury to the very nervous tissue. This kind of pain responds differently regarding narcotic analgesics.

In case of it, one can register the presence of a sensory deficit, characterized by hypoesthesia to touch, hypoalgesia to prick and hypoesthesia to hot and cold.

It often takes place also with paresthesia, hypo-density, hyperalgesia or allodynia.

### The pharmacological therapy of pain

The management of a cancer pain is an important stage of the therapy for oncological diseases. It aggravates to a great extent the quality of life of these patients.

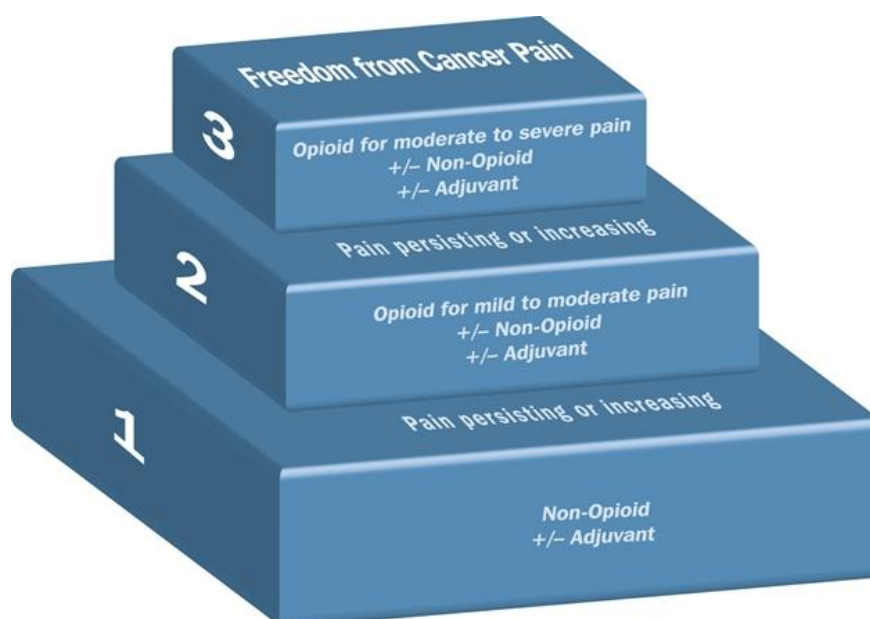
The modern pharmacological industry offers more and more new medicaments, which meet completely the needs of people ill with oncological diseases.

In this regard, the choice of an appropriate medicament must be based on the complete patient condition assessment. [4], [5]

WHO Analgesic Ladder can help you in the consistent choice of pharmaceuticals used for the struggle with a cancer pain. (Figure 2).

At this approach, the choice of individual analgesics (stipulated in a stepwise manner) is determined by the intensity of an oncological pain.

Non-steroidal anti-inflammatory drugs (NSAID) are a good choice in case of a mild up to moderate pain. In the cases when they do not produce a desired result or in the cases of moderate up to severe pain, in addition to them one must administer/give remedially also a narcotic analgesic. If at the second step of the therapy for an oncological pain, one does not achieve the necessary anesthesia/analgesia then one proceeds with the third one, at which one adds a stronger narcotic analgesic.



**Figure 2:** The three-step ladder of WHO for cancer pain relief in adults introduced in year 1986 in Geneva.[ 6]

At every single step, one can administer the so-called adjuvant analgesics, which potentiate the influence and effect of the other groups of pharmaceutical products.

The management of cancer pain must have the following sequence: (Figure 3)

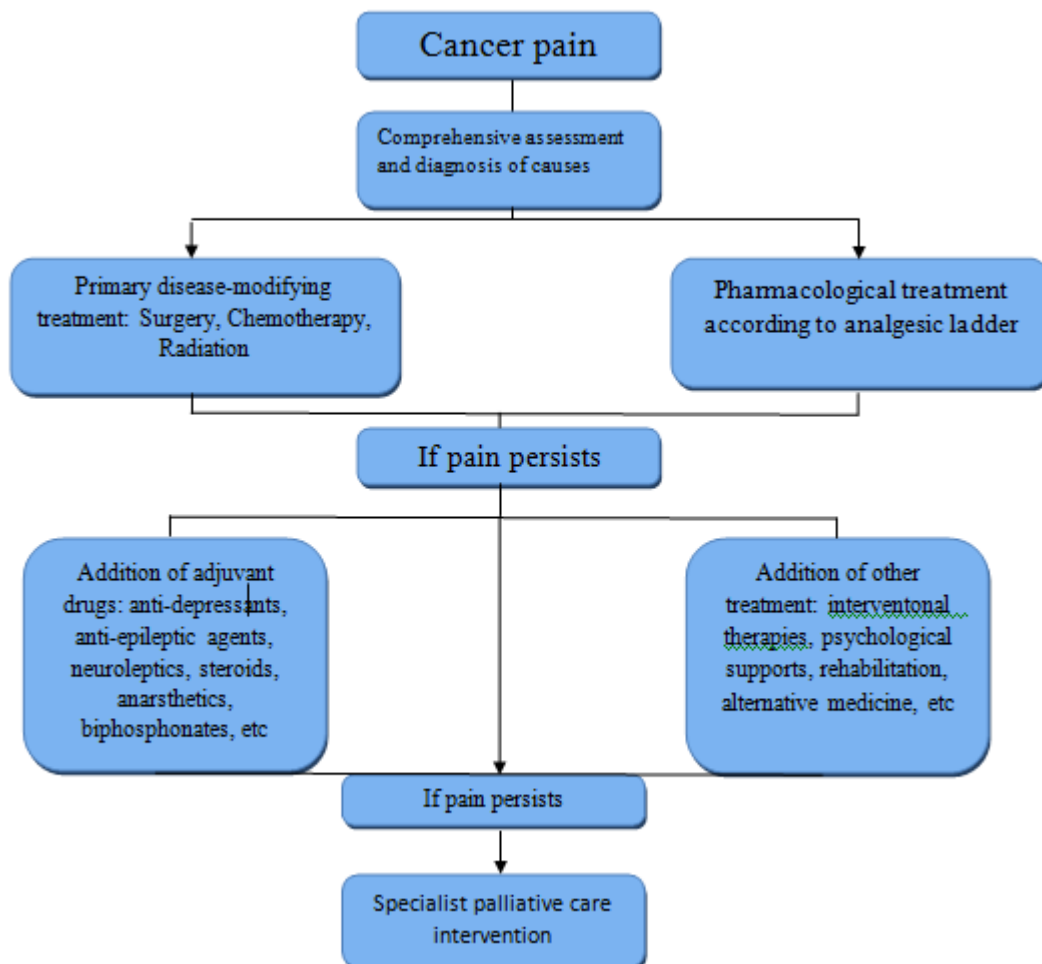


Figure 3: The management of a cancer pain [7]

The most often used groups of pharmaceutical products and the most commonly employed methods for the therapy of an oncological pain are:

#### Non-steroidal anti-inflammatory drugs.

The mode of their influence is based on the enzyme named COX (cyclooxygenase) and the generation of prostaglandins. They have not only a peripheral, but also a central mode of influence.

#### Adjuvant analgesics

Some of these drugs have a different basic application, but at certain pain syndromes they appear to be analgesics and for this reason, they are administered as primary pain therapy. Tricyclic antidepressants, anticonvulsants and corticosteroids belong to this group.

#### Opioid analgesics

According to their receptor influence they are pure agonists and mixed agonists-antagonists.

The pure agonists from the group of morphine are the most commonly used ones for the therapy of cancer pain.

At mixed agonists/antagonists, due to the existence of the so-called „ceiling“ of anesthesia and due to the risk of the exacerbation of an abstinence syndrome, their use is more restricted.

The most often used groups of medicaments and their doses are presented in Table 1, Table 2. [8], [9]

Table 1: [8] Opioid analgesics

Opioid	IV	PO/SL
Morphin	1 mg	3 mg
Transdermal	25 mcg	-
Fentanyl	25 mcg	-
Oxycodone	-	4,5 mg

Table 2: [9] Anticonvulsants Used as Adjuvant Analgesics  
**Anticonvulsants Used as Adjuvant Analgesics**

	Dose Range	Dosing Interval
<u>Gabapentin</u>	300-3.600 mg/d	At bedtime to four times daily
<u>Carbamazepine</u>	100-1.600 mg/d	Twice a day four times daily
<u>Lamotrigine</u>	150-500 mg/d	Twice a day
<u>Phenytoin</u>	100-300 mg/d	Daily
<u>Topiramate</u>	25-400 mg/d	Twice a day
<u>Divalproex</u>	150-3.000 mg/d	Three times a day
<u>Clonazepam</u>	1-10 mg/d	Twice a day
<u>Oxcarbazepine</u>	300-2.400 mg/d	Twice a day
<u>Zonisamide</u>	100-400 mg/d	Twice a day (daily)

### The mode of drug application

Usually in the case of patients ill with oncological diseases, one aims at the achievement of fast anesthesia and pain relief, which makes *the constant intravenous or subcutaneous infusion* of drugs a method preferred to the oral administration of medication.

It is applied at patients with gastrointestinal complaints, suffering from dysphagia, vomiting and others. This method of anesthesia and pain alleviation can be used also as therapy at home. Another widely applied method is *Patient-Controlled Analgesia (PCA)*.

The advantages, which this method gives are patient's independence from other persons and the immediate dosage of an analgesic according to momentary needs.

There is also a modification of this method, at which constant infusion is combined with an opportunity for a patient to take an additional (extraordinary) dose of a painkiller if necessary, but at predetermined intervals (which cannot be more frequent) and quantities.

### The spinal application of narcotic analgesics

By using this method, one achieves analgesia at a dose much lower than the usual one. Therapeutic scope, however, is much smaller, especially with patients, who still do not have tolerance.

### Transdermal application

In case of it, one uses adhesive plasters, which slowly release the narcotic analgesic under review. It represents an alternative to intravenous and subcutaneous infusion, in all cases of gastrointestinal disorders. However at certain patients, the application of analgesics administered/given remedially through some of the above-mentioned methods does not produce a satisfactory result. It necessitates the application of another types of analgesia related to the so-called *invasive techniques of pain therapy and management*.

### Neurolytic blockades

#### 1. The blockade of celiac plexus

It comes into use in case of pain at the upper region of one's abdomen, most often at pancreatic cancer or at an invasive tumor towards the root of mesentery. The frequent side effects of this type of a blockade are orthostatic hypotony/hypotonia and the development of a diarrheic syndrome. Upon the injection of phenol or alcohol in the psoas major muscle or in the lumbar plexus, one can damage peripheral nerves. In case of injury to the Artery of Adamkiewicz, the central nervous system is affected and one develops paraplegia due to spinal cord ischemia.

#### 2. Subarachnoid neurolytic blockades

This method represents the insertion of chemical agents in the epidural or intra-theal space. Nowadays, it is considered, that the intrathecal application of a hyperbaric solution of alcohol or phenol in glycerin does not have a selective effect on pain-conducting fibers. It conceals the risk of patient-invalidating health harms. For this reason, one recommends only the rhizotomy of cauda equine, whereas it

is the only technique from subarachnoid ones, which deserves to be used at the time of perineal pain.

### Neuroablative procedures

#### 1. Cervical transcutaneous tractotomy

It is the most efficient one of neuroablative procedures, due to its selective influence upon the spinothalamic tract. Cervical transcutaneous tractotomy provides complete analgesia in the contralateral half of human body from C<sub>5</sub> up to S<sub>5</sub> dermatomes.

### 3. Conclusion

Cancer pain is one of the most serious unfavorable manifestations of oncological diseases. It causes unpleasant physical and psychological suffering of patients, which aggravates considerably their quality of life. The struggle with it is multi-directional. Thanks to now existing modern medicaments and techniques of analgesia, to a great extent, there is adequate analgesia according to the individual needs of every patient.

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