

## Chapter 16

# Stress Associated with Orthopedic Surgery and Feeling Pain

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### ABSTRACT

*Injuries and degenerative disease of the skeletal and articular systems are the most common reasons for undergoing orthopaedic surgery. Those diseases are often associated with pain, which is experienced by the patient long before the surgical procedure. Strong stress reaction is the main source of adjustment disorders of patients undergoing surgical treatment. Orthopaedic surgery, like any other surgery, upsets body's homeostasis. The results of the surgery are not completely predictable, but are always closely related to life and health. Patients' strong stress reaction is also connected with anaesthesia (emergence from anaesthesia), being worried of complications caused by central neuraxial anaesthesia – the fear of paresis or death. The factor which influences worse adaptation process is the patients' post-surgery mood. Right after the surgery, patients feel worse than before it, they are weak, move less freely, they are anxious about their consciousness being dimmed due to medicine intake and pain. The expectations concerning the ways of controlling the dynamics of the pain one experiences are crucial. According to the researchers, in the central nervous system there exist neural circuits that may cause physiological reactions according to one's expectations, and due to this fact the pain one experiences may become stronger or alleviated depending on one's expectations. The lack of positive pain-reducing experience may lead to the learned helplessness or no sense of one's control over pain, both of which make the pain stronger. The pain-influencing factors include cognitive processes and emotions. The role of attention processes, one's cognitive appraisal and one's attitude towards pain has been emphasised, as well as the pain-modelling influence of emotions, all of which emphasise the complexity of one's pain experience.*

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## **Stress Associated with Orthopedic Surgery and Feeling Pain**

*Patients, when asked to point out the factors that hinder effective pain therapy, indicate frustration caused by the lack of information, numerous worries concerning the treatment and the stereotypical image of pain. Relieving tension influences the patient's mood positively, whilst stress influences it in a negative way. The stress one experiences and one's emotions lower one's pain threshold, which leads to greater pain experience and thus makes the healing process last longer. The quality of pre- and post-operational care is thus crucial, as it influences the level of the experienced stress. The pain components influence one another, there occur interactions of biological, psychological and situational factors, which makes it advisable to personalise one's pain treatment. The need of an interdisciplinary approach towards a person, especially to their health, has been recently emphasised. Pain is a biopsychosocial occurrence, which makes pain therapy an interdisciplinary problem. This chapter discusses the following issues: 1) The characteristics of pain in conditions that require surgical treatment, 2) Surgery-related stress reaction, 3) Psychological factors which influence how one feels pain, 4) The consequences of pain in people's functioning, and 5) Postoperative pain, the assessment of pain level and its relieving.*

## **INTRODUCTION**

### **The Characteristics of Pain in Ailments Which Require Surgical Treatment**

In the neurophysiologic sense experiencing pain is connected with the nociceptive tract, owing to which the stimuli are transmitted from the peripheral to the central nervous system. The nociceptive tract consists of specialized free nerve endings which respond to harmful stimuli and nerve fibres which transmit the information from peripheral cells to the spinal cord and then to the brain structures. It is a complicated and dynamic system, in which, besides the pain transmitting tracts, there also exist regulation mechanisms, which can modify the degree of pain and how long it lasts. The process which results in a subjective experience of pain in an individual is called nociception and is divided into four stages:

- **Transduction:** The change of the harmful stimuli's action potential into an electrical impulse,
- **Transmission:** Transmission of the impulse to the dorsal horn and to the central nervous system, through two types of nerve fibres – fast, myelinated A delta fibres and slow unmyelinated C fibres,
- **Modulation:** Stimulating, inhibiting, and accumulating the stimuli.
- **Perception:** The conscious experience of pain, its assessment and affective reactions (Suchocka, 2008).

In the medical sense there exist various classifications of pain, some of them being:

1. Classification due to the pain mechanisms:
  - **Nociceptive Pain:** The result of mechanical, thermal, chemical stimulation of pain receptors. There exist two kinds of nociceptive pain:
    - **Somatic Pain:** Divided into bone pain and pain resulting from deep tissue damage: skin, subcutaneous tissue or muscles. It is well-localized and easy to describe.
    - **Visceral Pain:** Diffused pain which is difficult to localise, originates from the internal organs; abdominal cavity, pelvis minor, coronary.

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