

# "Influence of Psychological Factors on Patellofemoral Pain"

Consensus Meeting:

Understanding Patellofemoral Pain

Saturday May 26, 2007

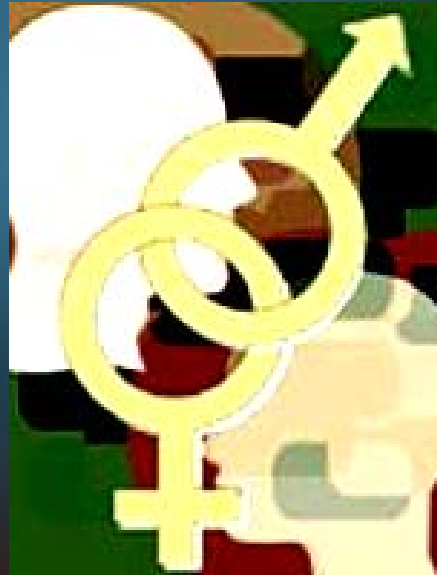
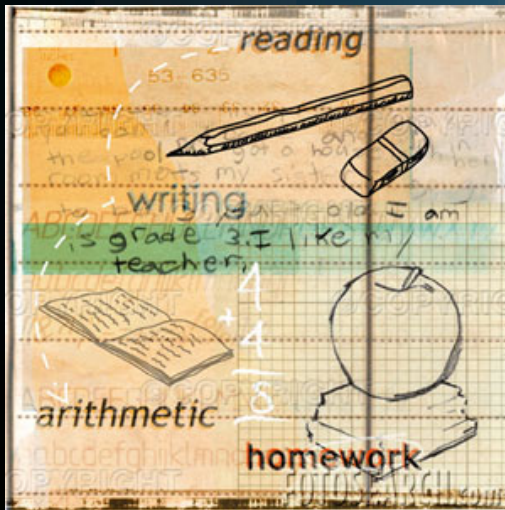
Firenze, Italy

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# Patellofemoral pain



The source of pain remains unclear.



# The Pathway of Pain Mechanisms:

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- Mechanical
- Neural
- Chemical

*Biedert RM, Kernen V. Neurosensory Characteristics of the patellofemoral joint: what is the genesis of patellofemoral pain? Sports Medicine & Arthroscopy Review, 2001;9(4):295-300.*

*Biedert RM, Sanchis-Alfonso V. Sources of anterior knee pain. Clin Sports Med 2002;21(3):335-347.*



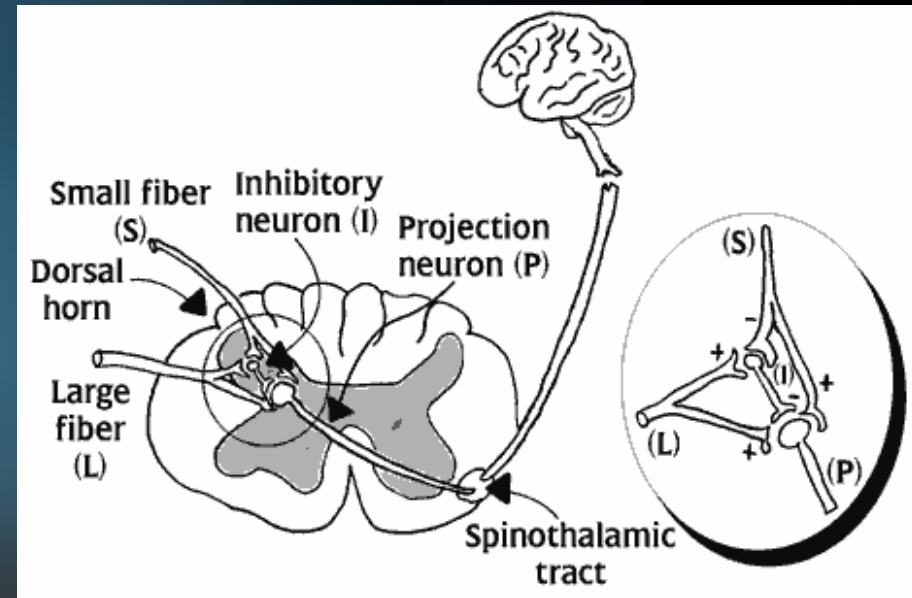
From René Descartes. *L'homme de Rene Descartes*. Paris: Charles Angot (1664)

*Benini A, DeLeo JA. Rene Descartes' Physiology of Pain. Historical Perspective. Spine, 1999; 24(20):2115.*

*Melzack R. Pain: past, present and future. Can J Exp Psychol 1993;47(4):615-29.*

# Gate Control Theory of Wall and Melzack

- The projection neuron (P) carries both nociceptive stimulation from small fibers (S) and non-nociceptive stimulation from large fibers (L) on the way to the brain.
- With no stimulation, the inhibitory neuron (I) keeps the gate "closed," and there is no painful sensation.
- With painful stimulation, the small fiber (S) blocks the inhibitory neuron (I), "opening" the gate for the projection neuron (P) to send on the painful stimulus.
- With the addition of non-painful stimulation, the large fiber (L) activates the inhibitory neuron (I), partially or completely closing the gate depending on the strength of the stimulation, and competes with the painful stimulation for access to the projection neuron (P).



*Melzack R, Wall PD. Pain mechanisms: a new theory. Scienc 1965;150(699):971-979.*

# Where Is Pain In the Brain?

The same part of the brain  
– the *anterior cingulate cortex* – responds to  
physical *and* emotional  
pain.



The National Institute of Mental Health Epidemiologic Catchment Area has found that about 22 % of the United States general population reported previous joint or limb pain, of which one quarter was medically unexplained.

*Walker EA, Keegan D, Gardner G, Sullivan M, Katon WJ, Bernstein D. Psychosocial factors in fibromyalgia compared with rheumatoid arthritis: I. Psychiatric diagnoses and functional disability. Psychosom Med 1997;59(6):565-71.*

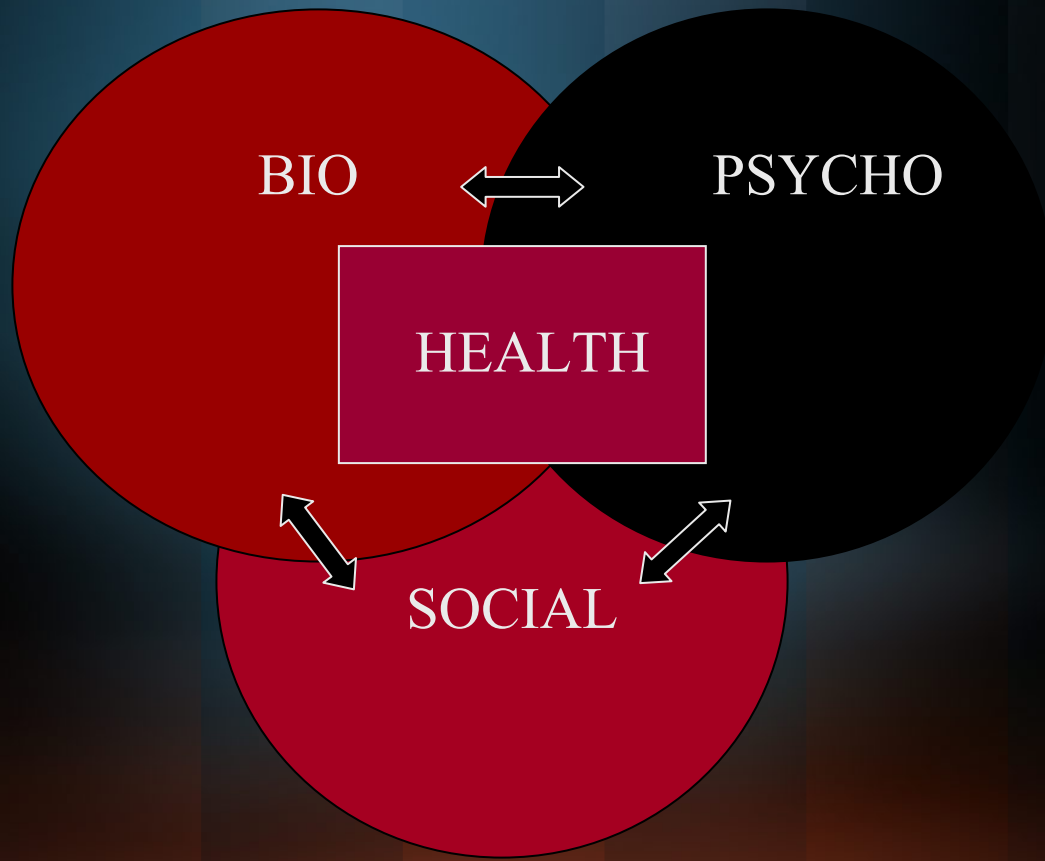


The pain may occur although the patient has never displayed any desired signs of tissue damage, like for example hysteria, stroke, fibromyalgia and indeed cases of low back pain. Commonly this pain is called "neuropathic" or "psychogenic", as opposed to "nociceptive" where physical causes are present.

*Bromm B, Lorenz J. Neurophysiological evaluation of pain.  
Electroencephalogr Clin Neurophysiol 1998;107(4):227-253.*

Although the organic etiology of fibromyalgia remains unclear, an expanding literature has implied that psychological factors may be important in its induction and maintenance. Also, for decades, rheumatoid arthritis was regarded one of „classic“ psychosomatic diseases.

*Boissevain MD, McCain GA. Toward an integrated understanding of fibromyalgia syndrome. II. Psychological and phenomenological aspects. Pain 1991;45(3):239-48.*



BIO

PSYCHO

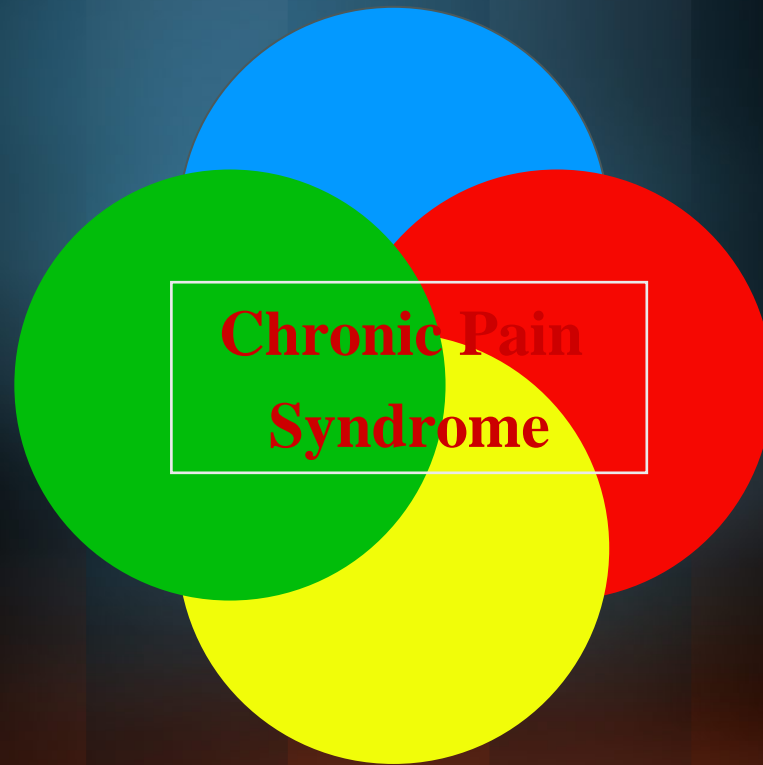
HEALTH

SOCIAL

- *Carlsson AM: Studies concerning pain assessment and egopsychological analysis of personalities in chronic pain patients. Thesis 1987; Karolinska Institute, Stockholm*
- *Cipher DJ, Clifford PA, Schumacker RE. The heterogeneous pain personality: diverse coping styles among sufferers of chronic pain. Altern Ther Health Med 2002;8(6):60-9.*
- *Craig KD: Emotional aspects of pain. In: Wall PD, Melzack R (eds): Textbook of pain. Churchill Livingstone, Edinburgh, 1984; 153-161*
- *Fishbain DA, Goldberg M, Meagher BR, Steele R, Rosomoff H. Male and female chronic pain patients categorized by DSM-III psychiatric diagnostic criteria. Pain 1986;26(2):181-97.*
- *Gregory RJ, Manring J, Berry SL. Pain location and psychological characteristics of patients with chronic pain. Psychosomatics 2000;41(3):216-20.*
- *Guez M, Brannstrom R, Nyberg L, Toolanen G, Hildingsson C. Neuropsychological functioning and MMPI-2 profiles in chronic neck pain: a comparison of whiplash and non-traumatic groups. J Clin Exp Neuropsychol 2005;27(2):151-63.*
- *Kosturek A, Gregory RJ, Sousou AJ, Trief P. Alexithymia and somatic amplification in chronic pain. Psychosomatics 1998;39(5):399-404.*
- *Orbach I, Mikulincer M, Sirota P, Gilboa-Schechtman E. Mental pain: a multidimensional operationalization and definition. Suicide Life Threat Behav 2003;33(3):219-30.*
- *Rorschach H: Psychodiagnostik. Methodik und Ergebnisse eines Wahrnehmungsdiagnostischen Experiment (Deutenlassen von Zufallsformen). Humber, 1941; Bern*
- *Weisenberg M: Cognitive aspects of pain. In: Wall PD, Melzack R (eds): Textbook of pain. Churchill Livingstone, Edinburgh, 1984; 162- 172*

- Hypochondriasis

- Depression



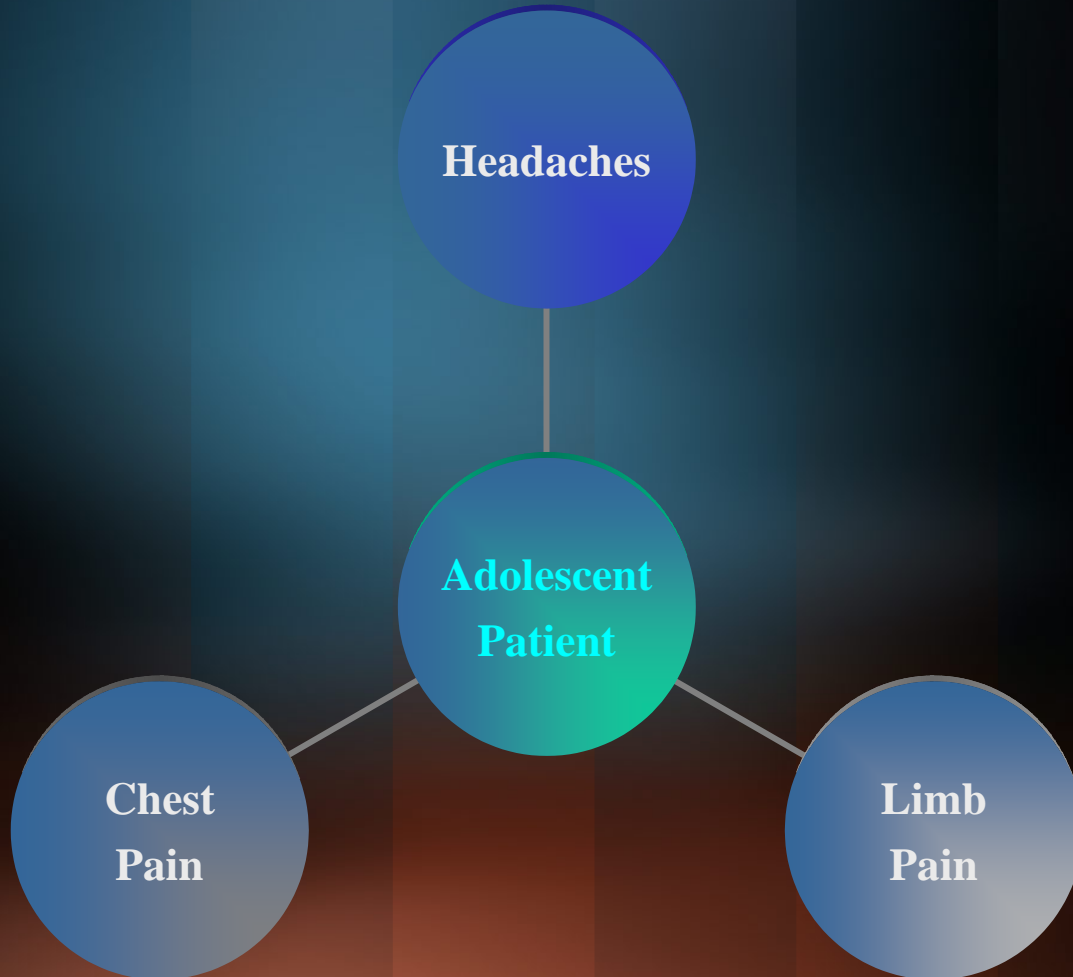
- Somatization

- Conversion Disorder

# Somatoform Disorders

„the occurrence of one or more physical complaints for which appropriate medical evaluation reveals no explanatory physical pathology or pathophysiologic mechanism, or, when pathology is present, the physical complaints or resulting impairment are grossly in excess of what would be expected from the physical findings“

*APA: Diagnostic and Statistic Manual of Mental Disorders. 4th ed. Washington, DC: American Psychiatric Press; 1994.*



**Headaches**

**Adolescent  
Patient**

**Chest  
Pain**

**Limb  
Pain**

*Mental pain is conceptualized as an apprehension of negative changes in the self and its functions that are attended by negative feelings.*

*Orbach I, Mikulincer M, Sirota P, Gilboa-Schechtman E. Mental pain: a multidimensional operationalization and definition. Suicide Life Threat Behav 2003;33(3):219-30.*





Romano and Turner did not find any significant relationship between chronic pain and depression. In their opinion chronic pain may lead to secondary depression, which also occurs in acute diseases as well as chronic conditions unaccompanied by pain.

*Romano JM, Turner JA. Chronic pain and depression: does the evidence support a relationship? Psychol Bull 1985; 97:18-34.*

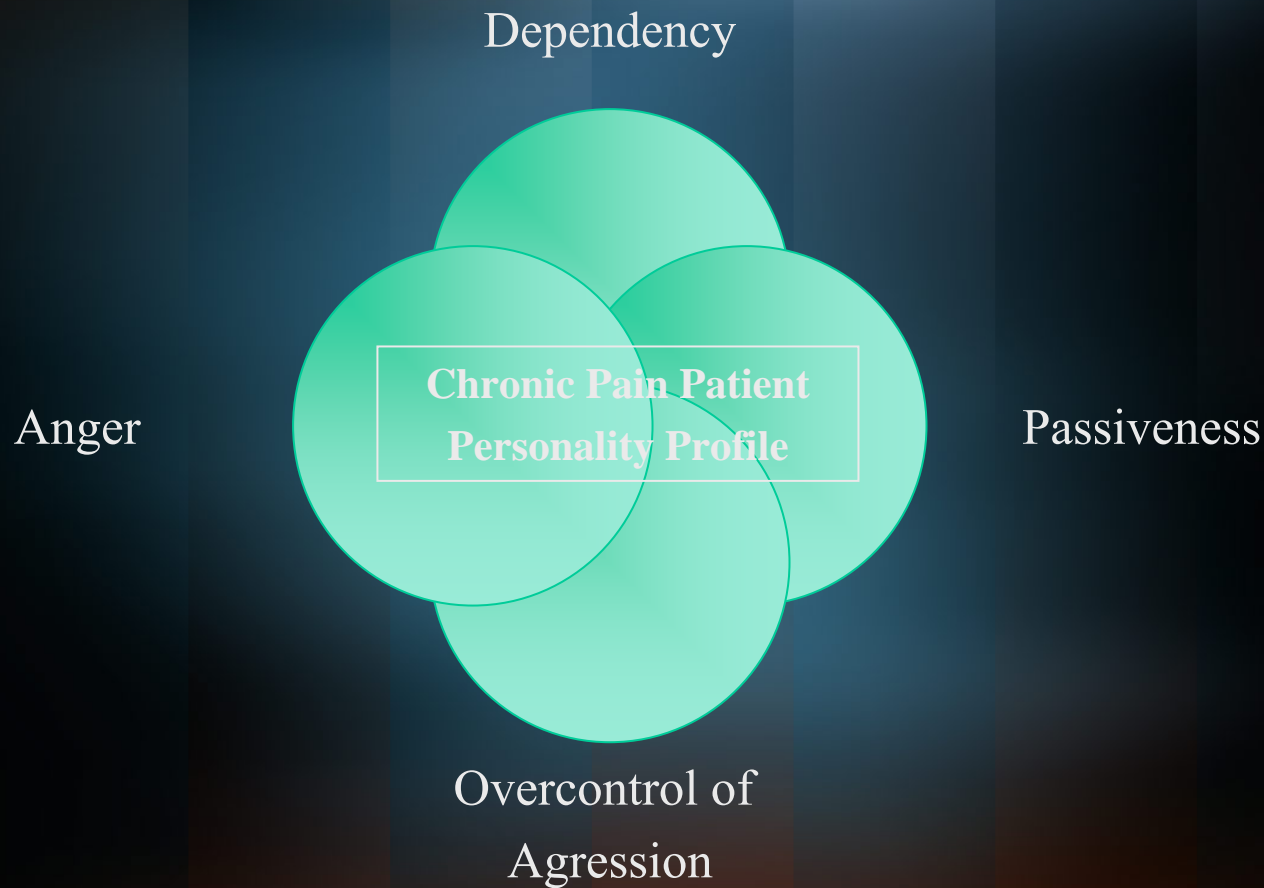
Simmonds et al. as well as Weisberg stated that there is the lack of evidence for "pain-prone personality", nevertheless they do not negate the mechanism of pain exacerbation and the further impairment of functional state by distress and depression.

*Simmonds MJ, Kumar S, Lechelt E. Psychological factors in disabling low back pain: causes or consequences? Disabil Rehabil 1996; 18(4):161-168.*

*Gatchel RJ, Weisberg N. Personality Characteristics of Patients With Pain. Washington, D.C., American Psychological Association, 2000.*

Slater et al. evaluated patients with chronic low back pain (CLBP) receiving conventional treatment and those receiving therapy supplemented with behavioral treatment. He revealed significant clinical improvement in one or more indices describing pain, disability and depression in 47% of patients who underwent psychotherapy.

*Slater MA, Doctor JN, Pruitt SD, Atkinson JH: The clinical significance of behavioral treatment for chronic low back pain: an evaluation of effectiveness. Pain, 1997; 71 (3): 257-263*



- Acklin MW, Bernat E: Depression, alexithymia and the pain proned disorder: a Rorschach study. *J Pers Assess*, 1987; 51: 462-479
- Carlsson AM, Werner S, Mattlar CE: Personality in patients with the long-term patellofemoral pain syndrome. *Knee Surg Sports Traumatol Arthroscopy*, 1993; 1: 178-183
- Leavitt F, Garron DC: Rorschach and pain characteristics of patients with low back pain and Óconversion VÕ MMPI profiles. *J Pers Assess*, 1982; 46: 18-25
- Sriram TG, Chaturvedi SK, Gopinath PS, Shanmugam V: Controlled study of alexithymic characteristics in patients with the psychogenic pain disorder. *Psychother Psychosom*, 1987; 47: 11-17

- Franz et al. extracted three Minnesota Multiphasic Personality Inventory (MMPI) data factors from low back pain (LBP), headache and pain-free subjects: lack of self-confidence, a strange bodily sensation, frankness. These three factors were then used as variables in an analysis that revealed that both headache and LBP patients were distinguishable from pain-free controls by their tendency to deny feelings of anger and aggression.
- Braha and Catchlore demonstrated difficulties in the appropriate expression of anger in chronic pain patients. According to them, the inhibition of anger may be responsible for pain.
- Hatch et al. reported individuals with tension headache, who showed proneness towards resentment, suspicion, mistrust and antagonism in their interpersonal relationships, measured by means of MMPI Cook-Medley scales and the State-Trait Personality Inventory test. In comparison with headache free controls, they were aroused towards anger more often but were more likely to suppress angry feelings.

*Fernandez E, Turku DC: The scope and significance of anger in the experience of chronic pain. Pain, 1995; 61: 165-175*

Personality characteristics in patients with long-term patellofemoral pain were compared by Carlsson et al. with those of matched controls and other groups both of non-patients and of psychiatric outpatients with character disorders. The mean age of the knee patients was 27.5 years and 27.7 years of their matched controls. The group of controls was homogeneous as regards educational level and occupation, while the knee patient group was more heterogeneous, varying from unskilled employees to students and professionals. Personality was described using the self-administered dependency and alexithymia scales, the Karolinska Scales of Personality and the Rorschach inkblot method. The Rorschach measurements suggested significantly greater depression, hostility and passive attitude in the knee patients as compared to the reference data. The hypothesised alexithymic characteristics in the knee patients were not confirmed.

*Carlsson AM, Werner S, Mattlar CE, Edman G, Puukka P, Eriksson E. Personality in patients with long-term patellofemoral pain syndrome. Knee Surg Sports Traumatol Arthrosc 1993;1(3-4):178-183.*

As first described by Sifneos in 1972, alexithymic features comprehend difficulties identifying and describing feelings, impoverishment of fantasy life, and excessive preoccupation with physical symptoms and external events.

*Nemiah JC, Sifneos PE: Affect and fantasy in patients with psychosomatic disorders, in Modern Trends in Psychosomatic Medicine, Vol 2, edited by Hill OW. London, UK, Butterworths, 1970, pp. 26-34*

*Sifneos PE. The prevalence of 'alexithymic' characteristics in psychosomatic patients. Psychother Psychosom 1973;22(2):255-62.*

Jensen et al. analyzed the psychological variables in patients with long-term patellofemoral pain. The group of 25 patients between 19 and 44 years of age with unilateral long lasting PFPS, and a control group of 23 year-old healthy subjects (age range, 18-44 years) participated in the study. Similarly to Carlsson et al. study, estimated groups consisted of males and females. The authors concluded that levels of mental distress were higher in the group with patellofemoral pain syndrome than in the control group, while levels of self-perceived health were lower. The results of the study indicate that the levels of knee pain and knee function correlate closely with the degree of mental distress and self-perceived health in individuals with patellofemoral pain.

*Jensen R, Hystad T, Baerheim A. Knee function and pain related to psychological variables in patients with long-term patellofemoral pain syndrome. J Orthop Sports Phys Ther 2005;35(9):594-600.*



Thomee et al. evaluated the way in which patients with patellofemoral pain syndrome experience their pain, coping strategies they use to control pain, and the degree of their well-being. Fifty patients, both women and men, 15-52 years old, were assessed with the multidimensional pain inventory (MPI), coping strategies questionnaire (CSQ) and Spielberger state trait anxiety inventory (ST AI). The data revealed high scores reported for the coping strategy “catastrophizing”, which should be specially considered when planning the surgical treatment for these patients.

*Thomee P, Thomee R, Karlsson J. Patellofemoral pain syndrome: pain, coping strategies and degree of well-being. Scand J Med Sci Sports 2002;12(5):276-81.*

Witoński et al. evaluated the psychological characteristics of patients with the anterior knee pain syndrome. The mean age of patients was 18.8 years, ranging from 15 to 23 years. All of them were females, with the same activity level, without any special sports discipline practised. The history of pain had lasted for a minimum eight months to a maximum of five years. There were only minor differences in educational and social background between the subjects in the study groups. The evaluation was performed by means of the Minnesota Multiphasic Personality Inventory test (MMPI).

*Witoński D, Karlińska I, Musiał A. Personality characteristics in patients with the anterior knee pain syndrome. Med Sci Monit, 1998; 4(6): 1019-1023.*

*Witonski D. Anterior knee pain syndrome. Int Orthop 1999;23(6):341-344.*

# The psychological characteristics of patients with anterior knee pain syndrome

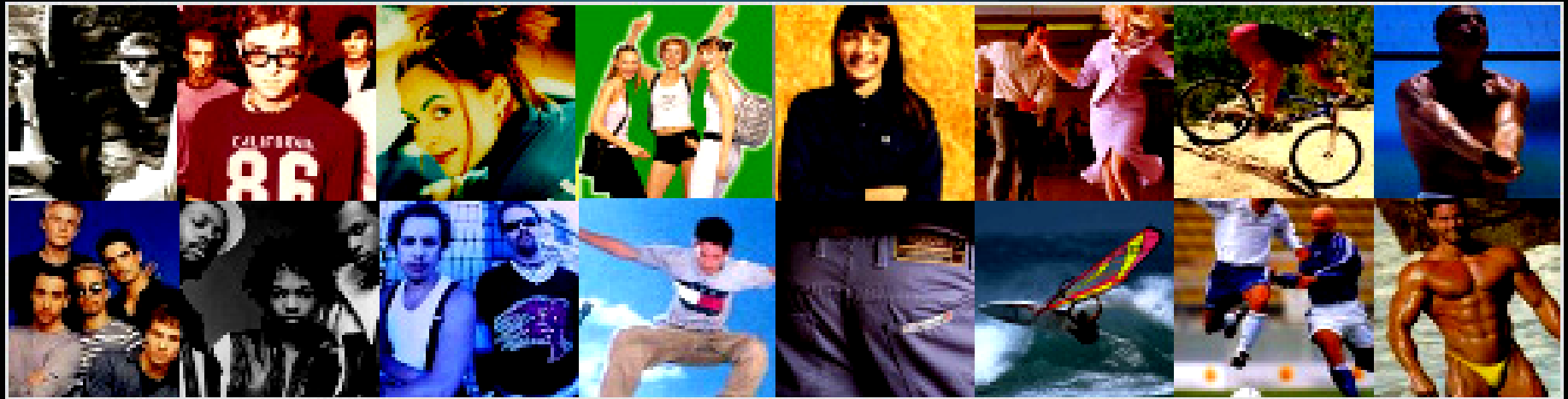


*HOS – Hostility scale  
ORG- Organic Symptoms  
R-S – Repression-Sensitization  
ES – Ego Strength scale  
MAS – Manifest Anxiety scale*

*SI5 – Social Introversion subscale  
SC2C – Schizophrenia subscale  
Pa2 – Paranoia subscale  
Hy4 – Somatic Complaints  
Pa - Paranoia scale*

Blumer D, Heilbron M. Chronic pain as a variant of depressive disease. *J Nerv Ment Dis* 1982; 170: 391-406.

Leavitt F, Garron DC. Rorschach and pain characteristics of patients with low back pain and "conversion V" MMPI profiles. *J Pers Assess* 1982; 46:18-25.



*Romano JM, Turner JA. Chronic pain and depression: does the evidence support a relationship? Psychol Bull 1985; 97:18-34.*

## **MENTAL CONDITIONS**

*Intense concentration or  
distraction or  
Involvement and interest in live  
activities*

## **PHYSICAL CONDITIONS**

*Medication  
Counterstimulation, eg massage*

## **EMOTIONAL CONDITIONS**

*Positive emotions  
Relaxation  
Rest*

**CLOSE  
GATE  
OPEN**

## **PHYSICAL CONDITIONS**

*Extent of the injury  
Inappropriate activity level*

## **MENTAL CONDITIONS**

*Focusing on the pain  
Boredom*

## **EMOTIONAL CONDITIONS**

*Anxiety or worry  
Tension  
Depression*

*“One leg is pharmaceuticals, another is surgery, and the third is what you can do for yourself. Mind/body medicine is strengthening the third leg, integrated with the other two legs”*

Benson 1975



*Benson, H. (1975). The Relaxation Response. New York: Avon Books.*