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CONTINUOUS MEDICAL EDUCATION (CME)

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Recommendations of the Polish Society of Physiotherapy, Polish Society of Family Medicine and College of Family Physicians in Poland in the scope of physiotherapy in painful shoulder syndrome in primary healthcare

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A – Study Design, **B** – Data Collection, **C** – Statistical Analysis, **D** – Data Interpretation, **E** – Manuscript Preparation, **F** – Literature Search, **G** – Funds Collection

Summary The objective of these guidelines in the scope of physiotherapy in primary healthcare is to suggest simple, uncomplicated and more cost-effective physiotherapeutic activities in patients experiencing pain due to painful shoulder syndrome. A general practitioner should decide whether the treatment undertaken within primary healthcare, including the process of physiotherapy, is effective and sufficient, or whether it requires more advanced activities, such as advanced diagnostics and further specialist treatment. The authors of the recommendations, apart from massage, also include procedures in the scope of kinesiotherapy, physiotherapy and orthopedic equipment. According to the authors, the aim of recovering the correct spatial system, called structural homeostasis, in the shoulder girdle, is, first of all, normalization of muscle tension and then inclusion in a rehabilitation program covering the methods to recover and consolidate the correct models of motor activity. The starting point for determining a rehabilitation program should be the ability to prepare a simple assessment of the patient's condition. This may result from a palpation examination to determine the incorrect distribution of resting tension in the area of the muscles and tendons engaged in the pathology and causing pain. The authors believe that such a solution contains the key to reducing the costs of treatment, providing access to physical therapists and quick assistance in the scope of improvement of a patient's clinical condition. At the same time, they emphasize the need to correct the previous healthcare model, so that it becomes a more effective tool in maintaining health.

Key words: general practitioners, shoulder pain, rotator cuff, shoulder injuries, shoulder impingement syndrome.

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Background

Pain associated with the musculoskeletal system is one of the most frequent causes of consultation in primary healthcare and usually affects more than one area of the body [1–3]. The third most frequent type of pain [4, 5], after back and hip pain, is painful shoulder syndrome, which constitutes a common problem in adults and has a negative effect on the ability to work, to perform everyday activities (driving, getting dressed, combing one's hair, preparing meals, eating), on sleeping and on the general quality of life [2, 6–9]. According to observations, the pains associated with painful shoulder syndrome are often chronic and recurring, and 40–50% of patients report persistent symptoms after 6 to 12 months, while 14% of patients continue treatment after 2 years [9].

Furthermore, it has been recorded that 10% of all referrals to physical therapists are associated with pain in the area of the shoulders [7]. With an ageing society and the relationship between more shoulder pain and age, according to estimates, more and more people with this diagnosis are going to report to their general practitioners [10].

As follows from a data analysis conducted in New Zealand, shoulder pain causes 14.7 persons per 1000 patients [11] to seek medical attention from family physicians, while in the Netherlands – 34 per 1000 [4].

Chester et al. indicate that the period of 2011–2012 was the first in Great Britain to record more cases of upper limb pain than cases of pain of the lumbosacral area [12].

In the Netherlands, clinical guidelines for general practitioners in the scope of treating patients with shoulder pain and recom-

mendations issued by the Dutch Society for Physical Therapy for patients with suspected pain in the subacromial area are applicable. Physicians jointly determined a classification of patients with non-specific shoulder pain into three subgroups: the first subgroup is patients with pain during abduction (located in the subacromial space), the second one – patients with passive movement limitation (pain of the shoulder joint), and the third one – patients with pain during abduction and passive movement limitation (instability, pain of the acromioclavicular joint or neck) [4].

A tendency for chronic shoulder pain lasting over 6 months has been observed in working people [3]. Half of the patients reporting this problem to their general practitioners manage to recover in half a year, and just 60% – in a year [13]. The results of the lengthiness and poor effectiveness of treatment of painful shoulder syndrome are long periods of absence from work, and even cases of losing one's job, as well as rising costs of treatment [1, 14, 15]. The costs associated with treating and diagnosing shoulder pain in primary healthcare are not known in detail. According to estimates (based on Swiss and Swedish data), 47–87% of the costs of treatment are associated with absence from work. It has also been observed that patients with direct access to physical therapists incurred lower costs related to healthcare [12]. In 2000, in the United States, the annual cost of treating patients with shoulder pain amounted to USD 7 billion [16]. The outcome of the therapy is affected by the period between the first incident of pain and the introduction of treatment, as painful shoulder syndrome is associated with pain in the area of the neck, and if lasting too long, it results in unsatisfactory results of primary care treatment [17]. Similar conclusions were included in a systematic review of 2013, which indicated that working patients aged 45–54 with chronic shoulder pain of significant intensity demonstrated worse results in the scope of physical therapy [12].

In the USA, ca. 4.5 million patients a year report to their physician, usually because of shoulder pain and incapacity resulting from rotator cuff impingement syndrome [16].

Shoulder pain, in particular the pain associated with rotator cuff impingement syndrome, is a common pain reported to a general practitioner. It follows from the research available that the general success ratio of conservative treatment is ca. 75% [18]. Research conducted on cadavers and radiological analyses demonstrated rotator cuff impingement syndrome in at least 10% of people aged 60 in the USA [19]. The estimated number of surgeries in this country resulting from rotator cuff impingement syndrome every year is between 75,000 and 250,000 patients. This number indicates that less than 5% of the patients in the USA with this type of damage were treated surgically [20].

On the basis of available literature, the authors noted that the key aspect of treating patients complaining about pain of the musculoskeletal system is cooperation between general practitioners and physical therapists [8, 9, 21–23]. The application of specialist diagnostic tests (MRI, ultrasound, arthrography, MRA) [24] should be proposed only at a later stage of treatment if physical therapy is not effective and if surgery is taken into account. [8]. As a result, it seems necessary to introduce systemic changes in diagnosing and treating patients with painful shoulder syndrome at the level of general practitioners. The recommendations include simple solutions, taking into account acting at the stage of first contact between patients and physicians. The authors present diagnostics of painful shoulder syndrome with diagrams supplemented with physiotherapy procedures, including massage, physical therapy, kinesiotherapy and orthopedic equipment, as well as emphasize the role of education and self-therapy.

Objectives

The objective of these guidelines in the scope of physiotherapy in primary healthcare is to suggest simple, uncomplicated and more cost-effective physiotherapeutic activities in patients experiencing pain due to painful shoulder syndrome.

Methods

Experts from the Polish Society of Physiotherapy, Polish Society of Family Medicine and College of Family Physicians in Poland conducted a detailed review of published scientific evidence associated with application of physiotherapy in painful shoulder syndrome in the years 1998–2018, published in the following databases: Pub Med, Cochrane Library. The search for articles was based on the following keywords: shoulder pain, pain, rotator cuff impingement syndrome, epidemiology, etiology, risk factors, guidelines. Of the articles found, the authors selected those that are comparable with the Polish primary healthcare system. A model of physical therapy procedure in patients with pain in the area of the shoulder was presented.

Definitions

As diagnostics of painful shoulder syndrome are complex, literature lists several conditions associated with pain in the shoulder joint, and the classification is mainly based on Codman's publication "The Shoulder". The following were differentiated:

- rotator cuff impingement syndrome,
- tendinopathy musculus biceps brachii,
- disorders in the area of the acromioclavicular joint,
- adhesive capsulitis (frozen shoulder),
- injuries of the shoulder joint (dislocations, fractures),
- non-specific shoulder pain [23, 25, 26].

Below can be found definitions useful in diagnosing pathologies connected with painful shoulder syndrome:

a) rotator cuff impingement syndrome (RCIS). Lädermann et al. considers rotator cuff impingement syndrome to be a condition in which at least two tendons are completely torn. Apart from torn tendons, at least one of the two tendons must be located behind the apex of the head of the humerus bone [27]. The clinical advancement in this diagnosis is determined by the number of injuries of the shoulder joint rotator tendons. Collin et al. classified impingements of the apex into 5 categories, A–E, depending on the location and number of damaged tendons. In turn, Cofield based his clinical classification on the size of damage. He listed: small (up to 1 cm), medium (1–3 cm), large (3–5 cm) and massive (over 5 cm) impingements of the tendon [27].

b) tendinopathy musculus biceps brachii. The most typical symptom is pain in the intertubercular groove of the arm, intensifying during compression [28]. Singajaru et al. claim that the main cause of pain in the anterior part of the shoulder is pathology of the LHBT (long head of the biceps tendon) [29].

c) subacromial impingement syndrome (SIS), commonly referred to as subacromial conflict. Pains are defined as pain in the shoulder joint radiating to the area between the neck and the elbow. A gradual deterioration of the motion range and intensification of pain during movements of the upper limb over the head is observed [25].

d) frozen shoulder syndrome (FSS). The current definition used by American surgeons, specialists in pathology of the shoulder and elbow joints, associated with adhesive capsulitis is as follows: "a condition of uncertain etiology, characterized by significant limitation of the active and passive movements of the shoulder, appearing in the absence of a known unequivocal internal dysfunction of the shoulder-blade" [30]. Le et al. define frozen shoulder syndrome as a pathological process caused by inflammation of the joint capsule and its arthrofibrosis caused by excessive scar tissue or adhesion in the area of the whole shoulder joint, leading to rigidity, pain and dysfunction [31].

Epidemiology

Painful shoulder syndrome appears in 18–31% of the total population [7]. According to estimates, in Great Britain, this

affects 14% of the British population [23]. In Europe, shoulder pain appears in 19% of the total population [32]. Of all the reported complaints of this area, SIS is the most frequent disorder and appears in 89% of all the reports submitted to general practitioners and physical therapists [33].

Complaints of the arm, neck or shoulder constitute a large proportion of work-related musculoskeletal disorders. It follows from research conducted on the Dutch population that after 12 months, 58% (n = 404) of persons suffering from chronic pains used the assistance of a general practitioner, specialist or physical therapist [34]. Medical advice associated with chronic CANS was provided to females more often than males (7.0% and 4.1%, respectively). What is more, the rate of using medical assistance by persons with chronic CANS is higher in the working population than among the unemployed [34]. It should be emphasized that CANS results from multiple factors. Predispositions include: psychosocial properties, personal and environmental factors. The significance of every element in causing pain is different and depends on the character of work [25, 34].

A review of literature indicates a significant correlation between pain of the musculoskeletal system and the type of work (work-related musculoskeletal disorders) [35, 36]. The high-risk group includes persons working with computers and manual workers. According to studies conducted on 513 office workers, 50.5% of them reported shoulder pain [37]. In this group of patients, the pain correlates to age and work experience [38]. It should be noted that, in most cases, their pain was non-specific [26]. Painful shoulder syndrome also often appears in healthcare professionals. The most exposed groups are nurses, physical therapists and dentists, of whom 23.5% report shouldered pain [39]. According to other reports, the above problem appears in 40% of nurses, midwives and physical therapists [40] and 18% of dentists [41]. It follows from the latest research that 52.39% of nurses above the age of 26 experience shoulder pain, mainly resulting from working over 40 hours a week [42]. Of those operating ultrasound equipment, 66.1% reported the above-mentioned issue on the left side of their body [43]. It follows from research into location of the pain in the musculoskeletal system and analyzing its occurrence in terms of frequency and prevalence that the percentage of patients with painful shoulder syndrome changed between 38% and 58% in the examined population, depending on the source [44]. Under the 2018 meta-analysis, the issue related to rotator cuff impingement appeared in 18% (300 of 1,513) of surgeons. The researchers emphasized the lack of awareness of the risks and the need for promoting knowledge of work ergonomics [45].

3–5% of the population is diagnosed with "frozen shoulder syndrome", usually people with diabetes and hyperthyroidism aged 40–59 [31, 46]. The pains may appear suddenly and progress gradually.

Shoulder pain may also be associated with certain sports disciplines. Of 340 athletes, this was experienced by 43.5% of people, of whom the highest ratio was people training at handball and judo [47]. It follows from other research that 40% of female volleyball players experienced non-traumatic shoulder pain, but only 33% of them took a break from training to treat it [48]. Other athletes exposed to shoulder joint injuries are tennis players [49] and disabled athletes in wheelchairs (16–76%) [50].

Etiopathogenesis

Due to the complexity of the causes of shoulder pain, the process of diagnosing them sometimes requires detailed diagnostics. Pain in this area may appear in the course of: diseases of blood vessels, nerve diseases and injuries, internal diseases, developmental disorders [28].

Painful shoulder syndrome constitutes a complex diagnostic issue for general practitioners. When determining treatment, structural lesions are noticed only in some cases, and if they are not – they result in further progression of the dysfunction (rotator cuff impingement) [51]. Chronic, non-specific shoulder pain is a more and more frequent problem requiring medical advice [52]. The causes include psychosocial factors, such as stress at work, relationships with colleagues, somatization, anxiety, depression or depressive disorders [3, 26, 53]. Attention is paid to the relationship between the incidence of painful shoulder syndrome with an uncomfortable body position, a high degree of motor monotypy associated with the upper limb and excessive physical exertion of the upper limbs combined with lifting heavy items or lifting items above the head [51, 54, 55]. Other causes include: age, female gender, obesity, marital status, smoking, hypercholesterolemia, fibromyalgia, rheumatoid arthritis, multiple sclerosis, genetic factors and vibrations resulting from work-related requirements [10, 14, 26, 56].

Shoulder pain should be examined not only in terms of the shoulder joint itself, but of the whole shoulder girdle. The pathology may refer to anatomic joint connections (acromioscapular joint, sternoclavicular joint, acromioclavicular joint), functional connections (scapulothoracic joint, subacromial joint), as well as muscles, tendons, nerves and vessels. Due to the degree of complexity of the above-mentioned structures that are interdependent in biomechanical, anatomic and functional terms, diagnostics and differentiation between pains may sometimes prove unsuccessful or prolonged [2, 57].

Due to the extent of the pathomechanisms causing dysfunctions in the area of the shoulder girdle and the associated limitations, the authors of these recommendations emphasize certain pains of the shoulder caused by orthopedic pathologies and agree that, apart from physical therapy, in justified cases, more technologically advanced diagnostics and specialist treatment should also be used, e.g. in the scope of neurology, internal diseases, neurosurgery, vascular surgery, orthopedics. However, they emphasize that, regardless of the more or less complex causes or pathomechanisms of the shoulder, the clinical joint symptoms appearing even at the initial stage of development of painful shoulder syndrome, include pain, disrupted the distribution of resting tension in the soft tissues, limited functionality. A general practitioner should decide whether the treatment undertaken within primary healthcare, including the process of physiotherapy, is effective and sufficient, or whether it requires more advanced activities, such as advanced diagnostics and further specialist treatment. The authors believe that such a solution contains the key to reducing the costs of treatment, providing access to physical therapists and quick assistance in the scope of improvement of a patient's clinical condition. Below we refer to the most frequent clinical diagnoses leading to shoulder pain.

Rotator cuff impingement syndrome (RCIS) refers to the following muscles: supraspinous, subspinous, subscapular and teres minor muscles. Structural lesions are usually observed in people in their 50s and are associated with ageing. The pathology usually appears in the tendon of the supraspinous muscle. Imbalance in muscle tension in the area of the rotator cuff not only results in inflammation of their attachments, but also in instability of the shoulder joint. Rotator tendons may be damaged as a result of: degenerative lesions, recurring microinjuries or significant injuries (falling on a stretched arm, pushing or pulling of the limb with significant power, displacement of the shoulder resulting from excessive movements), atraumatic irritations (e.g. repetitive movements) and secondary dysfunctions [58].

Effects may include inflammation of the musculus biceps brachii. The cause of inflammation in that area may also be a past injury or excessive strain [26, 59, 60]. Physicians recommend an MRI to diagnose the causes of rotator cuff disorders. It follows from observations that 40% of persons without symptoms after the age of 50 demonstrate irregularities in such an image [58].

Tendinopathy musculus biceps brachii. This diagnosis rarely occurs as an individual clinical problem. The pain is often re-

lated to dysfunction of the supraspinous muscle [60, 61]. The joint occurrence of lesions is especially justified, as the research conducted by Braun et al. confirms the anatomic and functional relationships between the listed structures [62]. Tendons of the above-mentioned muscles are engaged in stabilization of the head of the humeral bone, and damage to one tendon may affect the functionality of the other [60]. The most frequent causes of LHBT tendinopathy include inflammatory, traumatic and degenerative factors [60].

Subacromial impingement syndrome. A lot of factors are associated with potential development of SIS, including: anatomic irregularities in the coracohumeral arch or the head of the humeral bone, ischemia associated with tension overload, recurrent eccentric overloads, incorrect kinematic patterns caused by debilitation of rotator cuff muscles and dysfunction of the scapula stabilizer muscles and body posture disorders [63]. It has been demonstrated that four independent risk factors are related to SIS [64]. The first one is cigarette smoking (7 times higher risk of development of SIS in comparison with non-smokers). Cause: debilitated vascularization and extended healing time caused by consumption of nicotine. The second one is sleeping position (sleeping on the side was demonstrated as causing a 3.7 times higher risk of development of SIS than sleeping in the supine position). The third one is the shape of the acromion (the risk of development of SIS increases 6.3 times in the case of the hook shape in comparison with the flatter shape). The fourth one is profession, sports and daily activities which may increase the risk of development of SIS (in particular movements of the limb that are repetitive, uncomfortable, overburdening or leading to improper posture) [65]. The dysfunction usually causes pain of the anterio-lateral part of the shoulder joint. Other authors believe the cause of pain is pathological overloading and microinjuries of the supraspinous muscle. Another etiology is balance disruption during activity of the deltoid muscle and rotator cuff muscles, leading to destabilization of the connection between the head of the humeral bone and the joint socket. In the advanced stage of the disease, the rotator cuff is partly or completely damaged, and joint arthritis appears. [66]. In 50% of patients with acute symptoms of SIS, after medical intervention by a general practitioner, the pain sometimes disappears after 6 months, and in 40% – after 1 year. These results suggest that the condition in 10% of patients suffering from acute pain will not improve satisfactorily. Furthermore, 50% of patients with SIS and chronic pain may expect a relapse after 10, 12 or 18 months of the occurrence of the first symptoms [14].

Frozen shoulder syndrome. The etiology is usually idiopathic, and symptoms appear without a recognized cause [31]. The symptoms that accompany pain include: debilitation, rigidity, crepitation, edema, fear of movement, sometimes imbalance [2]. The predisposing diseases include hyperthyroidism, diabetes, hyperlipidemia and cerebrovascular diseases. Trigger factors include: immobilization, emotional experiences, mental strain [31, 66]. The incidence frequency is also higher in patients with Dupuytren's disease and Peyronie's disease and in patients after surgery of the heart or of the cervical spine [67]. It usually appears in females aged 40–60 and affects the dominant hand [66]. Other researchers record higher predilection in white patients, patients with a positive family history and with a positive HLA-B27 antigen [68]. The course of the disease may be acute (< 6 weeks), subacute (6–12 weeks) or chronic (> 6 months). There are 3 stages of the disease: freezing, frozen and thawing [2, 67]. Some researchers indicate four phases in the course of adhesive capsulitis. The first phase may last between 3 and 6 months and is characterized by acute pain, usually while resting. In the next phase, the pain subsides, but the result of the first phase is stiffness and further limitation of movement in all directions. The third phase is characterized by limitation of passive and active movements in every plane. In the last part of the course of the disease, there is observed a smaller level of pain and stiffness and gradual recovery of lost functionality, but as many as 50% of the patients never regain full mobility as was before the disease [26].

In their publication, Georgiannos et al. refer to formal diagnostic criteria, which include: 1. pain and progressive stiffness of the shoulder joint for at least 4 weeks; 2. strong shoulder pain making daily activities or work difficult; 3. night pain; 4. painful limitation of the range of shoulder movements, both during passive and active operation (height < 100°, limitation of external rotation by 50%); 5. untypical radiological image [69].

Clinical picture

Shoulder pain may significantly affect the functioning of the whole upper limb. The initial pain comes from the tissues supporting the structure of the shoulder joint [2]. They usually appear in the superior-lateral part of the shoulder, which may radiate to the neck and elbow. It appears in the shoulder joint during passive and active movements and may appear at night [14].

a) Interview

During the interview with the patient, attention is paid to such information as: course of the disease, history of injuries, dominant side, pain location, direction of movement that provokes pain, character of pain, type of work, effect of pain on sleep, co-existing diseases [23].

b) Functional assessment and clinical tests

The most frequent tool for assessing pain is the visual analog scale (VAS) concerning general feeling, during active movement and while sleeping. The active range of movement is then measured (flexure, extension, abduction, adduction, internal and external rotation) using a goniometer or tape measure [52]. Functional assessment usually consists of a Constant-Murley Score (CMS) questionnaire and a Shoulder Pain and Disability Index (SPADI) [70, 71]. Another useful test for identification of rotator cuff damage is a scapula stability test and a test of passive abduction in the patient's shoulder joint. Pain during movement means the result of the test is positive [72]. Damage to the tendon of the biceps brachii muscle is demonstrated in difficulty with flexure while lifting items to the height of the chest and pain in the anterior part of the shoulder [73]. Adhesive capsulitis is characterized by pain during passive external rotation movement of the shoulder [31, 74]. Detailed diagnostics associated with choosing a specific test for examining shoulder joint dysfunctions and the methods of performing them exceed the main purpose of this study.

c) Palpitation examination

During palpation examination of patients with shoulder pain, it is important to understand the anatomical connections and relationships in the discussed area. The basic anatomic structures include: proximal part of the humerus, the clavicle, scapula and ribs, the cortical and thoracic areas of the spine, as well as the muscles, tendons and ligaments surrounding and stabilizing these structures [2]. Assuming that the basic therapeutic objective of a general practitioner is reduction of pain in the shoulder, recovering the range of movements and improving functionality, it is necessary to conduct a palpation examination in order to obtain information on which muscles demonstrate intensified tension and tenderness and which limit movements. This may be conducted by checking the pressure sensitivity in the areas of their attachment, as presented in Table 1 [75–77].

Table 1. Palpation examination of pressure sensitivity of muscles and tendons – painful shoulder syndrome [76–81]

Muscle/tendon/nerves	Examination area	Commentary
longissimus muscle levatores costarum muscles 1–5	transverse processes of the thoracic vertebra $Th_{1–4}$	in order to exclude irritation of the top five intercostal nerves: additional palpation examination on costal cartilage 1–5 in the area of the sternum (if pressure sensitivity appears in this place, it may indicate irritation of intercostal nerves and thus increased sensitivity of the top five ribs with the muscles attached to them: serratus anterior muscle, pectoralis minor and major muscles, intercostal muscles; this is why it is accompanied by painfulness on the upper part of the scapula, coracoid process of the scapula and the greater tubercle of the humerus. In this case, we should start by normalizing the resting tension of the levatores costarum muscles and by eliminating pressure tenderness in costal cartilage 1–5
serratus anterior muscle levator scapulae muscle rhomboid minor muscle supraspinatus muscle	superior angle of the scapula	the examined muscles are attached in this spot; pain of the posterior part of the shoulder
pectoralis minor muscle coracobrachialis muscle biceps muscle – short head	coracoid process of the scapula	pain in the superior-anterior area of the chest and problem with lifting and abducting the upper limb
supraspinatus muscle infraspinatus muscle teres minor muscle	greater tubercle of the humerus	point in the anterior area of the shoulder and problem with abducting and lifting the upper limb
scalene muscles	transverse processes of cervical vertebra $C_{3–6}$	possibility of occurrence of irritation of the brachial plexus (between scalene muscles), which may be demonstrated by disruption in feeling in the whole hand
teres minor muscle	lateral side of the scapula in 1/3 of its central part	increased tone of the teres minor muscle may cause reduction of the quadrangular space housing the axillary nerve and the posterior circumflex artery of the arm, thus disrupting the functionality of the deltoid muscle
pectoralis major muscle	crest of the greater tubercle of the humerus	point in the anterior area of the shoulder and problem with horizontal abduction of the upper limb
latissimus dorsi muscle	lateral area of the spinous processes $Th_{5–7}$. External lip of the iliac ala at its highest point	spot pain between the scapulae at the height of $Th_{5–7}$ and difficulty with lifting the upper limb
trapezius dorsi muscle: ascending part transverse part descending part	triangular beginning of the scapula spine; upper border of the scapula spine; upper border of the shoulder end of the clavicle	difficulty with lifting the upper limb, pain between the scapulae, pain in the temporal area of the head caused by increased tension of the temporal fascia being in structural contact with the galea of the head and with the descending part of the trapezius dorsi muscle
deltoid muscle: anterior part central part posterior part	upper arm protuberance of the humerus	difficulty with abducting and lifting the upper limb

Table 2. Physiotherapy in painful shoulder syndrome [31, 33, 57, 63, 69, 70, 87–93, 96–100, 103–109, 113]

Muscles/ligaments/ /fasciae	Automassage	Massage	Auto-physiotherapy	Physiotherapy	Auto-kinesiotherapy	Kinesiotherapy	Orthotic equipment
longissimus muscle, levatores costarum muscles 1–5	rubbing in the area of the intermediate line of the sacral bone at the attachment of the lateral side of the longissimus muscle and on the nuchal line of the lower occipital bone – at the place of attachment of the longissimus muscle	flexor halluces longus, tibalis posterior (spot rubbing on terminal attachments), semitendinosus and semimembranosus muscle, gluteus maximus, longissimus capitis, levatores costarum muscles 1–5 until disappearance of pressure pain on the cartilaginous elements of the ribs (1–5)	hot or cold compresses (depending on patient's condition – acute, subacute or chronic condition, and on tolerance of thermal stimuli), application of painkilling ointments or creams or non-steroid anti-inflammatory drugs after warming the place of application up, Biopron lamp or led therapy or IR, TENS currents using small battery-powered devices, – an outstanding supplement is brine baths with mud extracts and baths with special inserts that generate water pearling or even ozone, – as a preventive or autotherapeutic element – also use of the sauna or bathhouse, many patients have access to magnetic mattresses, on which they can only sleep or take treatments twice a day	the objective of treatments using physical stimuli is to fight pain, to increase muscle flexibility and movement range, to improve trophy, to recover functionality and to generally improve life quality, after eliminating the contraindications, the physical therapist will act using its equipment (the same effects may be achieved through different procedures), the application may be local or based on the distribution of segmental innervation or peripheral nerves; one may combine physical stimuli from various groups (electrotherapy, light therapy, low-frequency pulsed magnetic field, UD, high-frequency electromagnetic field) in order to make the stimuli complementary and adequate to the reported symptoms and objectives of therapy	program of exercises to be performed at home (autotherapy), muscle tension normalization using simple techniques: TEM, stretching, re-learning correct posture	– special exercises: deep stabilization of cervical spine, – exercises improving correct alignment in the shoulder joint, – immobilization in some cases, – exercises increasing flexibility of the shoulder girdle muscles, spine muscles, upper limb, – exercises supporting rotator cuff muscles, – exercises in activating assisted movement (active with support, passive exercises, active exercises with support and with resistance), – exercises aimed at improving the range of movements (ROM) of the shoulder girdle (active exercises, active exercises with resistance), – mobilization techniques (TEM), – home exercise programs, – dynamic scapula stabilization exercises (using closed and open kinematic chains for the shoulder girdle), – exercise the ability to position and recreate the correct movement patterns – motor control exercises (kinetic control)	– braces for the shoulder joint for early intervention in preventive treatment and physical therapy of the shoulder, – flexible stabilization brace, incomplete support, short, – regulated stabilization brace, incomplete support, short, – flexible stabilization brace, incomplete support, long, – rigid stabilization brace with capacity for movements, incomplete support, – full support brace of the character of a sling
m. serratus anterior muscle levator scapulae muscle rhomboid minor muscle supraspinatus muscle	displacement and rubbing of the thoracolumbar fascia, middle part of the deltoid muscle	displacement and rubbing of the thoracolumbar fascia, middle part of the deltoid muscle, supraspinatus muscle, rhomboid muscle, levator scapulae muscle					
biceps muscle – short head coracobrachialis muscle pectoralis minor muscle	displacement and longitudinal kneading of the biceps muscle, rubbing of the coracobrachialis muscle	stroking of the biceps muscle, of the coracobrachialis muscle and at the end of the pectoralis minor muscle					
supraspinatus muscle infraspinatus muscle teres minor muscle	kneading and rubbing on the lateral edge of the scapula	stroking of the supra- and infraspinatus muscle and of the teres minor muscle, stroking of the lateral quadrangular space in order to normalize the functioning of the axillary nerve and posterior circumflex artery of the arm					

Table 2. Physiotherapy in painful shoulder syndrome [31, 33, 57, 63, 69, 70, 87–93, 96–100, 103–109, 113]

Muscles/ligaments/ /fasciae	Automassage	Massage	Auto-physiotherapy	Physiotherapy	Auto-kinesiotherapy	Kinesiotherapy	Orthotic equipment
scalene muscles	rubbing on the dorsal surface of the sacral bone, stroking and displacement of the neck fascia	gluteus maximus, biceps femoris, semitendinosus, semimembranosus muscle, erector spinae muscle, neck fascia, scalene muscles					
teres minor muscle	rubbing on the lateral edge of the scapula until disappearance of pain	stroking of the supra- and infraspinatus muscle and of the teres minor muscle, stroking of the lateral quadrangular space in order to normalize the functioning of the axillary nerve and posterior circumflex artery of the arm					
pectoralis major muscle	displacement on the scalenus anterior muscle in order to recover correct functionality of the internal thoracic artery, displacement on the anterior-inferior part of the chest, kneading of the pectoralis major muscle	stroking of the scalenus anterior muscle, stroking of the thoracic fascia in the inferior-anterior part of the chest, and then of the pectoralis major muscle					
latissimus dorsi muscle	no access	stroking of the latissimus dorsi muscle					
trapezius dorsi muscle	access only to the transverse and descending parts; rubbing and displacement of the muscle using the opposite hand	stroking of the trapezius dorsi muscle					
deltoid muscle	rubbing and displacement of the deltoid muscle in a sitting position, with the forearm resting on a table or a desk, so that the shoulder is slightly away from the body and decompressed	before stroking the anterior part of the deltoid muscle, in order to increase effectiveness of the massage, one may first stroke the descending part of the trapezius dorsi muscle; as for the posterior part of the deltoid muscle, one may stroke the transverse part of the trapezius muscle					

Physical therapy strategy

The main objective of physical therapy within primary healthcare is to use it in patients that most frequently use that form of treatment and to deal with so-called low-risk patients. This approach is proactive and aims to increase patients' responsibility for the process of therapy for current pains and prevention of relapse. The main emphasis is placed on preventive physical therapy, i.e. forms of broadly-understood education, access to finished studies and understandable selection of physical therapy activities that may be performed by the patient on his/her own at home, as well as preparation of descriptions of exercises and automassage, drawings, recordings, advice. Another important element should be education in ergonomic principles in everyday life and in protection against excessive overloading during regular everyday activities, thus eliminating the factors that maintain the risk of relapse of pain and developing useful motor strategies. Therapy should concentrate on the following tasks:

1) normalization of resting tension of muscles and fasciae (massage and poisometric muscle relaxation);
2) recovery of correct trophy in the tissues and organs of the motor system (inflow of arterial blood and effective discharge of venous blood and lymph), which provides conditions for correct regeneration or repair processes (in the case of tissue damage – past trauma or inflammation);
3) withholding of atrophy processes in muscles and connective tissue elements (ligaments, tendons, fasciae) – recovery of their structure and thus capacity (massage, physiotherapy, kinesiotherapy);
4) re-learning of correct movement patterns through targeted motor exercises of various degrees of complexity (kinesiotherapy), individualization of the rehabilitation program;
5) application of proper orthotic equipment and technical aides, as needed.

a) Massage

Available literature usually lacks details on the power of the respective stimuli used during various massage techniques, on frequency parameters, duration and depth of penetration and location of the massaged structures. The above reservations constitute a serious obstacle to comparing the results of own studies with the publications of other researchers [81]. A review of twelve studies of high methodological quality demonstrates the short-term effectiveness of massage in reducing pain of the shoulder, lack of significant functional improvement of the upper limbs or of a long-term painkilling effect [85]. As painful shoulder syndrome affects multiple structures, and previous studies were based on local work, the recommendations are going to include massage based on the principles of tension shifting in the areas of groups of muscles and fasciae in structural contact with each other, taking into account vessel and nerve connections [86]. Therefore, the structures in distant body parts, with structural relationships with the muscles and fasciae of the area of the shoulder, are also going to be massaged. As a result, it will be possible to recover correct innervation of the shoulder area, mainly from intercostal nerves, the brachial plexus and axillary nerve, as well as normalization of blood circulation from the anterior and posterior circumflex humeral artery and from the internal thoracic artery.

b) Physiotherapy

The selection of physical stimuli in skeletomuscular dysfunctions is based on symptoms. In painful shoulder syndrome, the main objective of physical treatments is to fight pain, to increase muscle flexibility and movement range, to recover functionality and to generally improve quality of life [70].

Based on a literature review by Page et al., it is known that using low-level laser therapy (LLLT), high-intensity laser therapy (HILT), therapeutic ultrasound, transcutaneous electrical nerve stimulation (TENS) and pulsed electromagnetic field therapy (PEMF) require further placebo-based research in order to confirm their clinical effectiveness [70].

In turn, the team of White et al. claim that other non-conventional methods of pain treatment are losing out in light of opiate epidemics and concentration by the medical community on pharmacotherapy. They indicate clinical trials describing the advantages of using electrotherapy and laser therapy as adjuvant treatment in treatment of both acute and chronic pain. According to the FDA, "non-pharmacological attitudes to pain treatment have been considered an urgent priority" [87]. It follows from the prepared literature review that TENS demonstrates poor evidence for effectiveness of pain relief in patients with fibromyalgia and is much less effective than electroanalgesia in the form of electro-acupuncture (EA) or percutaneous electrical nerve stimulation (PENS) [87]. As regards laser light therapy, what has been indicated has been a higher effectiveness in elimination of pain through the use of HILT in comparison with LLLT in the treatment of rotator cuff pain (pain and disability minimization, improvement of movement range) [87, 88] and in muscle and fascia pain of the trapezius dorsi muscle [89]. A short-term painkilling effect using HILT was confirmed in patients treated for subacromial conflict, frozen shoulder or inflammation of the lateral epicondyle of the humerus. However, the authors emphasize that it is necessary to conduct research on a greater scale in order to verify the advantages of HILT in comparison to LLLT and electrotherapy in reducing acute and chronic pain, as well as observations of the long-term effects of therapy [87]. It follows from the observations by other authors, however, that LLLT is more effective than a placebo or ultrasound in subacromial conflict syndrome, just like shockwave therapy is more effective than placebo therapy in the case of persistent shoulder tendonitis [90].

It follows from a literature review prepared by the team of Page et al. that 80% (16/20) of participants reported success in treatment of frozen shoulder using LLLT in comparison with 10% (2/20) of participants from the placebo group. Similar observations were made for pulsed electromagnetic field therapy (PEMF). Due to poor quality, evidence for the effectiveness of this therapy is uncertain. However, after a two-week cycle of treatments, a more effective improvement was observed, in terms of pain and functionality, than in the placebo subgroup. 75% (15/20) of participants reported a decrease in pain by 30% in comparison to 0% (0/12) from the placebo group [91].

The authors studying the impact of physical procedures (low-level laser therapy and ultrasound) on reducing myofascial pain syndrome (MPS) observed that laser therapy is the preferred type of therapy in reducing the myofascial pain of that area [92].

In another article, the authors reported the effectiveness of application of UD in the treatment of calcerous shoulder tendonitis, but they emphasized that there is little evidence for the significant clinical effectiveness of this method [93]. The positive effects of treatment of calcerous shoulder tendonitis using shockwaves were discussed in an article by the Yu team. At the same time, the authors emphasized that a review of literature demonstrated a lack of unequivocal evidence for the effectiveness of shockwave treatment in SIS [90].

In a randomized clinical trial, the team of Gomes et al. studied the impact of interference currents on pain related to SIS. It follows from analyzing the obtained data that adding interference currents to the subgroup with exercises and manual therapy, despite reducing pain, did not significantly improve the result in the NRS (Numeric Pain Rating Scale) [94].

It follows from another study (evidence level 1b) conducted by Rabini et al. that in patients with rotator cuff tendinopathy, the impact of local microwave diathermy on disability, arm functionality and pain was equivalent to the effects caused by subacromial injections of corticosteroids [95].

c) Kinesiotherapy

Shoulder pain is a frequent problem, in particular among adults. What is most important in making the decision on which therapy to choose is a diagnostic conclusion based on a systematic (subjective, objective taking into account functional tests) study that allows one to find and specify the actual causes of pain [96].

However, regardless of the etiology of pain, therapy based on pain control and rehabilitation using therapeutic exercises are applied in almost all of the above-mentioned clinical trials, as well as physical procedures and elements of manual therapy. The complexity of causes of shoulder dysfunctions results in continuous discussions as to the manner of pain control and functional recovery of movement range [97]. The obvious aim of the proposed therapies is fast recovery achieved through regained mobility (proper flexibility of soft tissues), muscle strength, pain elimination and recovery of lost or limited functionality in the shoulder joint. In the case of lack of unequivocal causes of pain, some shoulder-related problems may result from incorrect posture and disrupted distribution of muscle tension in the upper and lower parts of the back and neck, and this should be taken into consideration in therapy planning [98].

Work-related skeletomuscular disorders of the upper limbs and neck are some of the most frequent work-related disorders in the world. It follows from the randomized research conducted by Zebis et al. that high-intensity strength training, based on the principles of progressive loads, may be implemented among employees (working in static positions with a curved neck) and result in a clinically significant reduction in neck and shoulder pain in this group. Employee training included dynamic high-intensity muscle work with gradual load progression [99].

Other authors, before planning therapy procedures, analyzed in detail both the range and course of movements. Analysis of the scapulohumeral rhythm allowed one to assess shoulder joint alignment and quality of scapula movement (direction and range) and to follow the irregularities resulting from disruption of motor control of the muscles (in particular the trapezius dorsi muscle and the serratus anterior muscle) [101].

Rotator cuff conflict

The treatment plan in rotator cuff impingement in primary healthcare depends on several critical variables. The following factors should be taken into account in therapy planning: age, profession, pain level, initial functional capability and co-existing diseases. Proper pain control is important for motivating patients to participate in rehabilitation [18].

According to numerous authors, the exercises improving movement of the shoulder joint and girdle (in the scope of flexion, abduction, external and internal rotation) and recovering shoulder girdle flexibility and muscle strength include: posture exercises, pendulum exercises using the upper limbs, slow active exercises (e.g. raising shoulders), active exercises with support (suspension), active exercises with support and resistance, exercises with a prop (e.g. a cane) to support active movement, exercises with flexible resistance (TheraBand) or dumb-bells. During therapeutic sessions, isotonic exercises, as well as static loads and isometric muscle work, were used. Furthermore, an important element of the kinesiotherapeutic program of rehabilitation is exercises stabilizing the scapula, performed in a lying position with and without load, with control of the scapula activity model [33, 97, 101, 103].

Kuhn suggests, in order to maintain shoulder fitness, reinforcing the therapy effects by applying, in home therapy, daily exercises improving muscle flexibility and range of movement in the joint and to use muscle strengthening exercises 3 times a week [97]. In order to improve flexibility of pectoral muscles and external rotators of the shoulder joint, it is recommended that autotherapy include stretching [103, 104].

In earlier publications, the authors emphasized that so far there is no convincing evidence for the effectiveness of physiotherapy in long-term improvement or in preventing a relapse of shoulder pain. It also follows from randomized controlled trials that there are no premises for applying physical procedures and various combinations thereof. Although motor therapy is considered to be the "cornerstone" of physical therapy, there has only appeared limited evidence for its effectiveness, which requires further research [105].

LHBT tendinopathy

It follows from the observation of a small group of patients (n = 10) by McDevitt et al. that exercises of an eccentric-concentric character applied in patients with chronic LHBT tendinopathy may be useful in fighting pain, but this requires further observation [106].

SIS

In the case of shoulder pain caused by SIS, physical therapy is often the first choice for therapy. However, the therapeutic effectiveness of the applied methods is not always confirmed in literature. For this reason, people continue to look for new solutions [101].

The results obtained by Worsley et al. suggest that 1 week of exercises, including motor control training for the scapula, strengthening of the trapezius dorsi muscle and serratus anterior muscles, manual techniques recovering the flexibility of shortened muscles (e.g. stretch, trigger point therapy), may improve functionality and reduce pain in younger people with signs of subacromial conflict [100]. However, according to the authors, the research should be repeated on a larger population, with randomization.

Another randomized trial conducted by the Scandinavian team of Engebretsen et al. compared the effectiveness of supervised exercises to shockwave in patients experiencing pain in the subacromial area. After 18 weeks, 64% of patients (32 persons) in the exercising group experienced reduced shoulder pain and improvement of disability in comparison with 36% (18 persons) in the subgroup treated with shockwaves. It was demonstrated that a significantly higher percentage rate of patients in the subgroup with supervised exercises experienced an improvement (odds ratio 3.2, 95% confidence interval = 1.3 to 7.8). In the exercising subgroup, significantly more patients returned to work (p = 0.016) [107]. Similar results were demonstrated by the above-mentioned research group in a publication from 2011. 29 (60%) participants in the SE (supervised exercises) subgroup supervised by a physical therapist, in comparison with 24 (52%) participants in the rESWT (radial extracorporeal shockwave therapy), demonstrated clinical improvement. Fewer patients in the SE subgroup required additional treatment in the period between 18 weeks and 1 year [107].

In the rehabilitation program proposed by other authors, in the first period, the objective of therapy was to relax the tense muscle, and then start manual and flexible resistance for the muscles cooperating with the scapula, thus improving joint movement. The therapy included the rehabilitation program used in the trials of other authors [101, 102].

In their research, Moezy et al. assumed that the potential cause of subacromial conflict may be dysfunction in the biokinematic chain caused by debilitation of the scapula stabilizers (levator scapulae muscle, rhomboid muscles, serratus anterior muscle, trapezius dorsi muscle). Lack of synergy among muscles, disrupted timing, a decrease in nerve-muscle coordination, debilitation, changed activity result in untypical loads, thus leading to subacromial compression [63]. In the proposed therapy, a team of researchers compared the impact of the applied therapy on improvement of movement range, the painkilling effect and scapula movement control in two subgroups. The first

subgroup (ET – Exercises Therapy) underwent a 6-week cycle of supervised exercises, and the other subgroup (PT – Physical Therapy) underwent 6 weeks of physical procedures (Solux lamp, TENS, UD) together with exercises. The resultant analysis indicated that despite reduction in the level of pain on the VAS scale, no significant statistical differences were achieved. However, the ET subgroup demonstrated considerable different mobility of the shoulder joint. The authors believe that effect is a result of exercises reducing the tension of the shoulder joint capsule and the recovering flexibility of the pectoralis major muscle. Therefore, in SIS, inclusion of scapula rehabilitation exercises in the program seems to be justified [64]. The Swedish authors who presented the algorithm for physical therapy in treating shoulder pain agreed with these conclusions. An expert panel consisting of physical therapists agreed on the main principles of using motor therapy in shoulder pain (limited number of exercises, performed with proper scapular-humeral coordination, alignment of the humeral joint, gradual introduction of exercises without causing shoulder pain). The algorithm emphasizes that decisions regarding physiotherapy should be based on the results of clinical assessment and not on structural pathology. Furthermore, it was confirmed that the main physiotherapeutic intervention in treatment of shoulder pain and dysfunction is associated with active motor therapy. Available data suggests that a supervised program of exercises brings about clinical benefits in short- and long-term observation in comparison to no treatment or a placebo. Despite the growing evidence for the significance of physiotherapy (in particular motor therapy) in the treatment of shoulder pain, there is no consensus regarding the most effective exercise strategy [5].

The results demonstrated by the team of Aytar et al. indicate that a rehabilitation program with scapula mobilization did not significantly affect functional improvement, increased range of movement, reduced pain or satisfaction of patients with SIS syndrome [57].

The article by Gebremariam et al. was equally skeptical regarding the effectiveness of physiotherapeutic methods in subacromial impingement syndrome. Although the authors argue that some methods, despite moderate evidence of their effectiveness, seem promising in the treatment of SIS. At the same time, they emphasize that further research based on a higher class of evidence is required [65].

It follows from the research conducted by the team of Abdulla et al. that the effectiveness of supervised exercises, conducted independently or in combination with exercises performed in home conditions, is similar to invasive surgery in subacromial conflict syndrome [108]. It follows from a systematic review of literature prepared by other authors that there is little repeatable evidence to confirm the effectiveness of corticosteroid injections in treating rotator cuff subacromial conflict [109].

Frozen shoulder

Le et al. emphasize that treatment of frozen shoulder continues to be an unresolved clinical problem. So far, no universal conservative treatment algorithm has been developed; therefore, therapy should be adapted to the patient [31]. Adhesive capsulitis is often considered a self-limiting disease that subsides between the 1st and 3rd year of existence. However, various research has demonstrated that 20–50% of patients may develop chronic symptoms [31]. Three types of methods are possible in frozen shoulder treatment: conservative, pharmacological and surgical treatment in lack of progress from non-invasive treatment.

As for physiotherapy, there is no consensus as to the type, frequency or intensity of exercises. It follows from analyzing the research results published in the Cochrane Collaboration of Systematic Reviews that the effects of manual therapy and physical exercises are comparable to the therapeutic results of glucocorticosteroid injections and arthroscopic subacromial decompression, but these conclusions are based on evidence of poor quality [70].

The selection of the approach to treatment depends on the patient's functional status at the time of clinical examination. Principally, some researchers believe that conservative therapy should be continued for 6 months, with the level of pain monitored over this period [69].

Conservative treatment includes oral pharmacotherapy with nonsteroidal anti-inflammatory drugs (NSAID), intraarticular injections of hyaluronic acid and corticosteroids, as well as physical therapy.

However, Calis et al., in a comparative study, demonstrated that intraarticular injections of hyaluronic acid were less effective than intraarticular injections of corticosteroids or physical therapy in the treatment of frozen shoulder [110].

In turn, in an RCT, Hsieh et al. demonstrated that adding injections of hyaluronic acid to conventional physical therapy did not result in significant benefits in the treatment of patients with FS, and thus such injections may unnecessarily generate additional costs of treatment [111]. It also follows from analyzing the studies published in the Cochrane Library that the effects of annual therapy and exercises may be comparable to injections of glucocorticosteroids and invasive surgical intervention, but this conclusion is based on evidence of poor quality [112].

Although physical therapy is included in FS therapy, there are no unequivocal guidelines for the selection of therapeutic methods. Selection of the most effective option will be determined by the clinical condition for the patient and by observation of progress in pain elimination and functional improvement. In a study by Diercks et al., what was noted was the impact of exercise intensity on the outcome of therapy in patients with FS. The results of two subgroups of patients were compared: undergoing therapy of high and low intensity (including passive stretching and mobilization above the pain threshold vs. actively supported exercises within pain limits). After two years, only 63% of people from the first subgroup and 89% from the second subgroup achieved satisfactory functionality of the shoulder joint [113]. In literature, there is still no consensus as to which therapeutic option is better, mainly due to the absence of high-quality evidence. However, it should be emphasized that, regardless of the stage of disease, the most important objectives are eliminating pain, removing joint stiffness, maintaining correct movement range and recovering functionality [69].

Orthopedic equipment and work ergonomics

In chronic inflammatory conditions of the shoulder, in the cases of light damage to soft tissues of the shoulder joint and in the cases of mechanical overloading and degenerative lesions, flexible stabilization braces (bands) are often used. They cover the acromioclavicular joint, the shoulder joint and the shoulder. They are made of soft and/or flexible materials and are equipped with additional belts bringing the shoulder closer to the chest, and some cover the opposite part of the chest. These types of bands are effective in supporting the shoulder in muscle debilitation conditions and reduce joint loads with various types of pains, improve joint compactness after injuries of capsules and, additionally, stabilize the scapula. Band-type braces work well in early therapeutic interventions and perfectly supplement physical therapy. In inflammatory conditions of the soft tissues surrounding the shoulder, when it is not always necessary to limit mobility, more advanced structures are applied which, in the SICAMMP classification, are called stabilization rigid braces with possibility of movement. We should also take into consideration various other types of braces, such as slings, which are very useful in the therapy of patients with increased muscle tone while resting, in order to consolidate the therapeutic effects after a massage normalizing muscle tone [82, 83].

Summary

The authors of the recommendations note that, apart from an injury-related dysfunction, each of the above-mentioned pains demonstrate a similar mechanism of development. Incorrect distribution of muscle tone in the shoulder area causes disturbance in innervation and blood supply, which manifests in a feeling of disruption, tingling, local feeling of cold, debilitation of muscle strength and, in the long run, structural lesions, thus translating to more or less abrupt lesion dynamics resulting in gradual loss of local mobility. According to the authors, the aims of recovering the correct spatial system, called structural homeostasis, in the shoulder girdle, is, first of all, normalization of muscle tension (regardless of the etiopathogenesis of the pain) and then inclusion in a rehabilitation program covering the methods of recovering and consolidating the correct models of motor activity.

As a result, the authors suggest starting with a massage for the purpose of recovering proper resting muscle and fascia tone as the foundation for further recovery of disrupted functionality of the shoulder complex. According to the authors, while looking for effective and cost-effective solutions for patients with painful shoulder syndrome, massage should be supplemented with the procedures in the scope of kinesiotherapy, physiotherapy and orthopedic equipment, while emphasizing the significance of patient education and autotherapy after instruction. The basis for deliberations in the search for the most effective model for treating patients with shoulder pain is the guidelines included in the article entitled: "Consensus for physiotherapy for shoulder pain". The authors of this publication emphasize the significance of clinical assessment in determination of the cases of functional deficit. Authors of the publication emphasize the importance of clinical evaluation in diagnostics causes of functional deficits. The more so that the analysis of imaging studies sometimes indicates the presence of structural changes in the shoulder in people without clinical symptoms, and sometimes shows a weak relationship between the level of shoulder pain and disability and the level of structural deficit detected during imaging. These observations challenge the validity of imaging procedures for the purposes of determining the source of symptoms in the shoulder and emphasize the significance of a detailed clinical assessment as the foundation for determining the aims of treatment [5]. It follows from a review of literature that researchers continue to search for the most effective solutions, supported with evidence, for treating painful shoulder syndrome.

The remarks included in the above-mentioned article, as well as the recommendations for treatment of pain in the spine, hip and now also shoulder in primary care, provide an opinion in the discussion associated with looking for the best practices in treatment of this type of dysfunction on the basis of cooperation between family physicians and physical therapists.

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