

# Competitive Advantages of the Rehabilitation Methods under Development as a Strategic Factor of their Introduction Efficiency (Through the Example of Phytocomplex SMC-Electrophoresis)

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## Abstract

The risk reduction when introducing new rehabilitation methods into practical health care requires analyzing their competitive advantages at the development stage. The goal is to assess the competitiveness and positioning of the rehabilitation methods under development through the example of phytocomplex SMC-electrophoresis, and to substantiate the strategic role of the obtained results for introducing the method into medical practice.

**Materials and methods.** 19 experts participated in assessing competitiveness. Positioning included a survey of 72 patients suffering from knee osteoarthritis. The method of SWOT analysis was used in the work.

**Results and discussion.** Higher competitive advantages of the developed method – phytocomplex SMC-electrophoresis - were determined as compared with traditional SMC therapy and drug therapy. The most important parameters included the method efficiency (rank 17), the duration of remission (rank 16), and regression of clinical symptoms (rank 15). Strengths and weaknesses of the method, opportunities and threats for its introduction into medical practice were revealed and structured.

**Conclusion.** The opportunity of assessing competitive advantages of the developed rehabilitation methods by using results of clinical and preclinical researches is shown. Recommendations on forming a strategic plan for introducing a new method on the market are given.

**Key words:** marketing of medical services, rehabilitation, electrophoresis, phytotherapy, knee osteoarthritis.

## INTRODUCTION

The creation of new rehabilitation methods under the current market conditions is associated with the risk of a limited demand for them in practical public health. It is known that the largest cost item when developing new technologies is the cost of dead-end projects that for various reasons cannot be implemented in practice [1]. As a rule, this is due changes in the marketing environment, development trends and conduct of the target market rather than medical aspects of new methods [2-4].

According to the authors, the assessment of competitive advantages of new rehabilitation methods at various stages of their development will allow minimizing the degree of risk and will play a strategic role in their further implementation in medical practice.

The analysis of competitive advantages includes assessment of the new rehabilitation methods competitiveness and positioning. There are various approaches and methods for analyzing the competitive advantages of services and goods that use the M. Porter's model, benchmarking, BCG matrix [5, 6]. According to the authors, the Delphi method (individual or group) and the prioritization method are the most efficient and effective ones for the analysis of new rehabilitation methods [7].

The marketing research was conducted through the example of the developed method of rehabilitation of patients suffering from knee osteoarthritis – phytocomplex SMC-electrophoresis.

Osteoarthritis is the most wide-spread joint disease in the world. It is observed in 10-20% of the adult population and continues to grow steadily [8]. The osteoarthritis cannot be treated only by using medicines. That is why there is a need to search for new methods and technologies of multilevel impact to achieve maximum therapeutic effect [9-11]. This can be contributed by the comprehensive use of phyto- and physiotherapy, including phytocomplex SMC-electrophoresis together with the drug treatment.

The assessment of competitive advantages of new rehabilitation methods should be implemented systematically

when developing and introducing new technologies in a highly competitive environment [12].

The goal of the work is to show the possibility of assessing the competitiveness and positioning of the developed rehabilitation methods through the example of phytocomplex SMC-electrophoresis, and to substantiate the strategic role of the obtained results for the further introduction of the method into medical practice.

## MATERIALS AND METHODS

The object of the research was a new method of rehabilitation of patients suffering from knee osteoarthritis – phytocomplex SMC-electrophoresis [13]. Traditional methods of rehabilitation were considered as competitors, including SMC therapy and drug therapy that included “basic” chondroprotective drugs, nonsteroidal anti-inflammatory drugs, drugs that reduced stasis and improved microcirculation, as well as general tonic drugs and vitamins.

The competitiveness was analyzed by using the Delphi method (individual expert evaluation method) with the subsequent calculation of integral indicators [7]. Parameters for assessing competitiveness were offered. They included particular and general indicators of the rehabilitation efficiency that were used when conducting clinical research of phytocomplex SMC-electrophoresis [13]. For example, these parameters included particular criteria of clinical symptoms regression offered by the American Rheumatology Association (ARA): pain score, amplitude of movements and its limitation, joint index, knee joint score, swelling index; the criteria adopted by the European Agency for the Evaluation of Medicinal Products (EMEA), U.S. Food and Drug Administration (FDA) supported by the EULAR, the British Society of Rheumatology (BSR), the Association of Russian Rheumatologists and recommended by OARSI: the pain indicator by the WAS, the WOMAC index: the pain syndrome index (PW), the stiffness index (SW), daily activity index (FW), the Leken index, the activity indicator of the IA; criteria of the

patients' life quality according to the HAQ questionnaire; indicators of the state of microcirculation in the affected joint: the level of capillary blood flow, vasomotor activity of microvessels, the intensity of microcirculation; biochemical indicators of the exchange of connective tissue, electrolyte metabolism, metabolic parameters; the general international OMERACT-OARSI criterion; and indicators of late results for maintaining the curative effect. Competitiveness assessment parameters also included contraindications, side effects, equipment and material procurement of the method, level of complexity when preparing for the procedure, its cost, the required professional level of the medical staff, commodity indicators of the phytocomplex (consumer properties, quality, raw materials), the convenience of the drug form of phytocomplex (dry extract), rationality of its packaging, possible phytocomplex sales volume, its cost, the possibility of implementing the method on the Russian market, the size (capacity) of the target segments, possible growth rates of the target segments, the level of competition in the target segments, possibility of using advertising to attract patients, the incidence of osteoarthritis, and technological variables in physiotherapy.

Experts assessed the parameters in physiotherapy (26%), rehabilitation (32%), rheumatology (21%), pharmacy (5%), pharmacognosy (5%) and marketing (11%). Previously, the level of every expert candidate's competence was defined. The competence was assessed by calculating the competence coefficient ( $C_c$ ) taking into account professional characteristics of the candidates and the calculated indicator (the argumentation coefficient) [7]. The level of competence was considered sufficient if  $C_c \geq 0.25$ . It was desirable for the experts to have working experience in the area for at least 5 years. The competitiveness was assessed on a 5-point scale. The final assessment for every parameter was calculated as a weighted average taking into account the experts' competence [7]. Some experts assessed not all parameters, but only those where they were competent. In total, 19 people took part in assessing the competitiveness of the new rehabilitation method – phytocomplex SMC-electrophoresis.

Positioning was carried out by the quantitative method of individual points' estimates (on a 5-point scale) [14]. A questionnaire that made it possible to determine the target segments and a blank for positioning were created for patients. The list of positioning parameters and their estimated indicators was made. The list included the indicators reflecting the main complaints of patients suffering from knee osteoarthritis: joint pain, discomfort, morning stiffness, joint stiffness, mobility restriction and meteorosensitivity. The following parameters were also included in the list: general efficiency of the method, quality of life, side effects, the sustainability of the rehabilitation results, availability of medical services, the possibility of obtaining a paid medical service, its cost, quality of service, comfort in providing the services, wait time for the service, and location of the medical institution in relation to the place of residence.

72 patients having a diagnosis of knee osteoarthritis of stage 1-2 (33% and 67%, respectively) participated in the survey. Women predominated (72%). All patients underwent a course of rehabilitation by using the new method – phytocomplex SMC-electrophoresis. Clinical researches were conducted in accordance with the fundamental ethical principles of the Helsinki Declaration, good clinical practice (GCP) and the current regulatory requirements. Clinical researches of the phytocomplex SMC-electrophoresis in the rehabilitation of patients suffering from the knee osteoarthritis were allowed by the Intercollege Ethics Committee of the Association of Medical Pharmaceutical Higher Educational Institutions of Russia. All patients obtained drug therapy; 86% of patients had previously undergone a course

of SMC therapy. Positioning was assisted by nurses studying according to specialty *Nursing* at the *Sechenov First Moscow State Medical University*.

In order to identify and structure opportunities and threats for the introduction of the new rehabilitation method into medical practice, the quantitative method of SWOT analysis was used [7]. The parameters were assessed on a 5-point scale.

The results were statistically processed by using the SPSS.Statistics.v17. Multilingual-EQUINOX (SPSS Inc) software.

## RESULTS AND DISCUSSION

The assessment of the competitiveness of the new rehabilitation method was preceded by the determination of the significance of parameters by ranking them by experts. Table 1 shows a fragment of assessing the competitiveness of the phytocomplex SMC-electrophoresis as an example of calculating the main indicators.

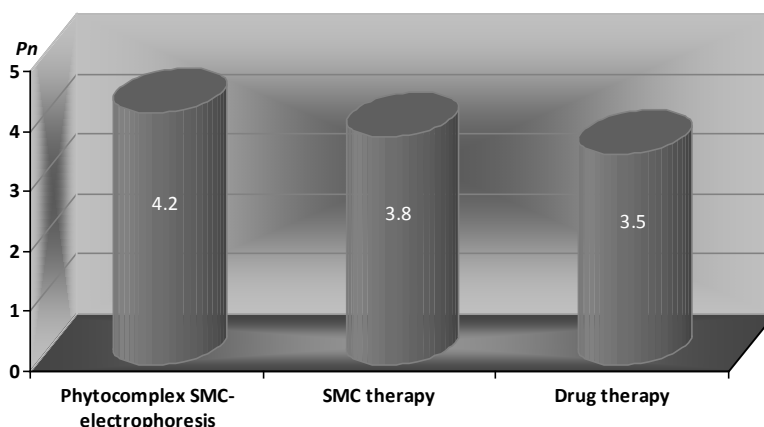
A general analysis of the competitive advantages related to the researched methods of rehabilitation of patients by 38 parameters showed that the most competitive was the phytocomplex SMC-electrophoresis ( $P_n = 4.2$ , Figure 1). Traditional methods of treatment were inferior to the new technology in terms of parameters characterizing therapeutic efficiency (for example, according to the OMERACT-OARSI criterion: SMC+PhC –  $P_i=0.23$ ; SMC –  $P_i=0.20$ ; DT –  $P_i=0.11$ , table; by the duration of remission (SMC+PhC –  $P_i=0.21$ ; SMC –  $P_i=0.17$ ; DT –  $P_i=0.13$ , table), by the level of competition in the target segments (SMC+PhC –  $P_i=0.03$ ; SMC –  $P_i=0.01$ ; DT –  $P_i=0.01$ ); and by their growth rate (SMC+PhC –  $P_i=0.02$ ; SMC –  $P_i=0.01$ ; DT –  $P_i=0.01$ ). It is necessary to note that the phytocomplex SMC-electrophoresis was behind competitors according to the parameters "Convenience of the medical form of phytocomplex" (SMC+PhC –  $P_i=0.04$ ; SMC –  $P_i=0.05$ ; DT –  $P_i=0.05$ ); "Complexity level when preparing for the procedure" (SMC+PhC –  $P_i=0.04$ ; SMC –  $P_i=0.06$ ; DT –  $P_i=0.07$ ; table 1); and "Required professional level of medical staff for the physiotherapeutic procedure" (SMC+PhC –  $P_i=0.05$ ; SMC –  $P_i=0.06$ ; DT –  $P_i=0.077$ ). It is related to the need to *ex tempore* prepare the spray material of phytocomplex for electrophoresis. After introducing the new method to the market and increasing the volume of the phytocomplex sales, it will be possible to expand the range of drug forms (in the form of a ready-made solution), which will increase the competitiveness of the new technology. The parameters characterizing the commodity features of the phytocomplex were estimated only for the phytocomplex SMC-electrophoresis according to the results of preclinical researches. The remaining methods were marked with the maximum score. Parametric indices of the traditional methods of rehabilitation prevailed over the integral indicators of the new method according to the capacity of the target segments (SMC+PhC –  $P_i=0.01$ ; SMC –  $P_i=0.03$ ; DT –  $P_i=0.07$ ). When introducing the phytocomplex SMC-electrophoresis into medical practice, it is necessary to expect an increase in the number of patients due to attracting not only the "innovators" of rehabilitation, but also the labile part of the "conservatives". Marketing motivation of sales based on principles of ethical norms should play an active role in this process.

The new rehabilitation method – phytocomplex SMC-electrophoresis – was positioned in two target segments. Patients of the first segment differed from patients of the second segment by age: the first segment included patients aged from 45 to 60 years (36 people), the second segment – people aged from 60 to 75 (36 people).

**Table 1. Fragment of Assessing the New Method – Phytocomplex SMC-Electrophoresis**

Parameter	Rank ( $R_i$ )	Rank value ( $C$ ) <sup>*1</sup>	Parameter value ( $W_i$ ) <sup>*2</sup>	Rehabilitation method					
				Phytocomplex SMC-electrophoresis (SMC+PhC)		SMC therapy (SMC)		Drug therapy (DT)	
				$(A_i \pm a)$ <sup>*3</sup>	$P_i$ <sup>*4</sup>	$(A_i \pm a)$ <sup>*3</sup>	$P_i$ <sup>*4</sup>	$(A_i \pm a)$ <sup>*3</sup>	$P_i$ <sup>*4</sup>
OMERACT-OARSI criterion	38	0.00135	0.0513	4.46± 0.06	0.23	3.85± 0.04	0.20	2.11± 0.06	0.11
IA activity indicator	34		0.0459	4.42± 0.03	0.20	4.36± 0.02	0.20	4.32± 0.02	0.20
Duration of remission	37		0.0500	4.25± 0.08	0.21	3.46± 0.06	0.17	2.65± 0.09	0.13
WOMAC index	36		0.0486	4.31± 0.04	0.21	4.18± 0.05	0.20	3.95± 0.04	0.19
Level of complexity when preparing for the procedure	11		0.0149	2.65± 0.04	0.04	3.88± 0.06	0.06	4.96± 0.04	0.07
Target segments' capacity	12		0.0162	1.08± 0.02	0.02	1.62± 0.02	0.03	4.89± 0.03	0.08
...									
Combined parametric index ( $P_n$ ) <sup>*5</sup>				4.2		3.8		3.5	

Note. <sup>\*1</sup> -  $C=1/\sum R_i$ ; <sup>\*2</sup> -  $W_i=C \cdot R_i$ ; <sup>\*3</sup> -  $(A_i \pm a)$  - average assessment, point; <sup>\*4</sup> -  $P_i$  - parametric index,  $P_i=A_i \cdot W_i$ ; <sup>\*5</sup> -  $P_n=\sum P_i$ .



**Figure 1. Results of Assessing Competitiveness of the New Rehabilitation Method – Phytocomplex SMC-Electrophoresis ( $P_n$  – a Combined Parametric Index)**

The positioning form included 17 parameters to be assessed. Patients ranked them depending on the degree of criterion significance. The integrated indicators were calculated similarly to the data presented in the table.

The analysis of competitive advantages showed that for almost all patients the most important parameters were the method efficiency and the duration of the therapeutic effect after the rehabilitation course ( $R_i = 17$  and  $R_i = 16$ , respectively). The comparative analysis of the combined parametric indices ( $P_n$ ) determined that the phytocomplex SMC electrophoresis held a more favorable position in the patients' consciousness as compared to the traditional treatment methods in target segment 2 and only slightly exceeded the latter in target segment 1 (Figure 2). Consequently, when introducing the phytocomplex SMC-electrophoresis into medical practice, the patients of target segment 2 should be considered as the reference consumers of this medical service, and to a greater extent the whole complex of marketing activities should be focused on target segment 2.

It is necessary to note that patients of segment 2 preferred the new method because of considerable therapeutic efficiency of the rehabilitation course (SMC+PhC -  $P_i=0.48$ ; SMC -  $P_i=0.43$ ; DT -  $P_i=0.37$ ) expressed by clinical symptoms regression (for example, joint pain: SMC+PhC -  $P_i=0.44$ ; SMC -  $P_i=0.40$ ; DT -  $P_i=0.34$ ); higher quality of life after the treatment (SMC+PhC -

$P_i=0.32$ ; SMC -  $P_i=0.29$ ; DT -  $P_i=0.23$ ), and the longest duration of the achieved remission (SMC+PhC -  $P_i=0.46$ ; SMC -  $P_i=0.42$ ; DT -  $P_i=0.35$ ). There were almost no side effects after the course of physiotherapy. That is why the patients of two segments assessed this parameter approximately similarly for all treatment methods. All respondents underwent a course of rehabilitation including the phytocomplex SMC-electrophoresis and SMC therapy free of charge. That is why the parameters "Possibility of obtaining a service on a paid basis" and "Rehabilitation course cost" were not actual for them. This explains the low rank of these parameters ( $R_i=4$  and  $R_i=6$ , respectively). The phytocomplex SMC-electrophoresis was behind the traditional methods of treatment according to the parameter "Availability of the medical service" (for example, in segment 2: SMC+PhC -  $P_i=0.05$ ; SMC -  $P_i=0.21$ ; DT -  $P_i=0.25$ ). This criterion depends on a number of indicators used for analyzing the competitive advantages of the rehabilitation method under development and is of fundamental strategic importance for the introduction of the new method into practical medicine.

The obtained results of assessing the competitiveness and positioning of the phytocomplex SMC-electrophoresis made it possible to identify and structure the existing and projected opportunities and threats for the introduction of the new rehabilitation method into medical practice. To assess them, the

quantitative method of SWOT analysis was used. It was determined that by the level of favoring for introducing the phytocomplex SMC-electrophoresis, the strengths of the new method considerably exceeded its weaknesses ( $P_n=4.6$  and  $P_n=-3.7$ , respectively), and favorable opportunities of the environment only slightly exceeded the threats ( $P_n=4.1$  and  $P_n=-3.9$ , respectively) (Figure 3). In the situation when prospects and dangers are close, the introduction of the new method is considered risky. When developing a strategic plan for

introducing the new method to the market, it is necessary to use principles of the differentiated marketing, and for target segment 2 that complies with the goals and opportunities of introducing the method into medical practice most of all, to create a separate version of the marketing complex that fully takes into account the strengths of the new technology. Ideally, the strategic plan should take into account all opportunities to be used, and threats to be neutralized.

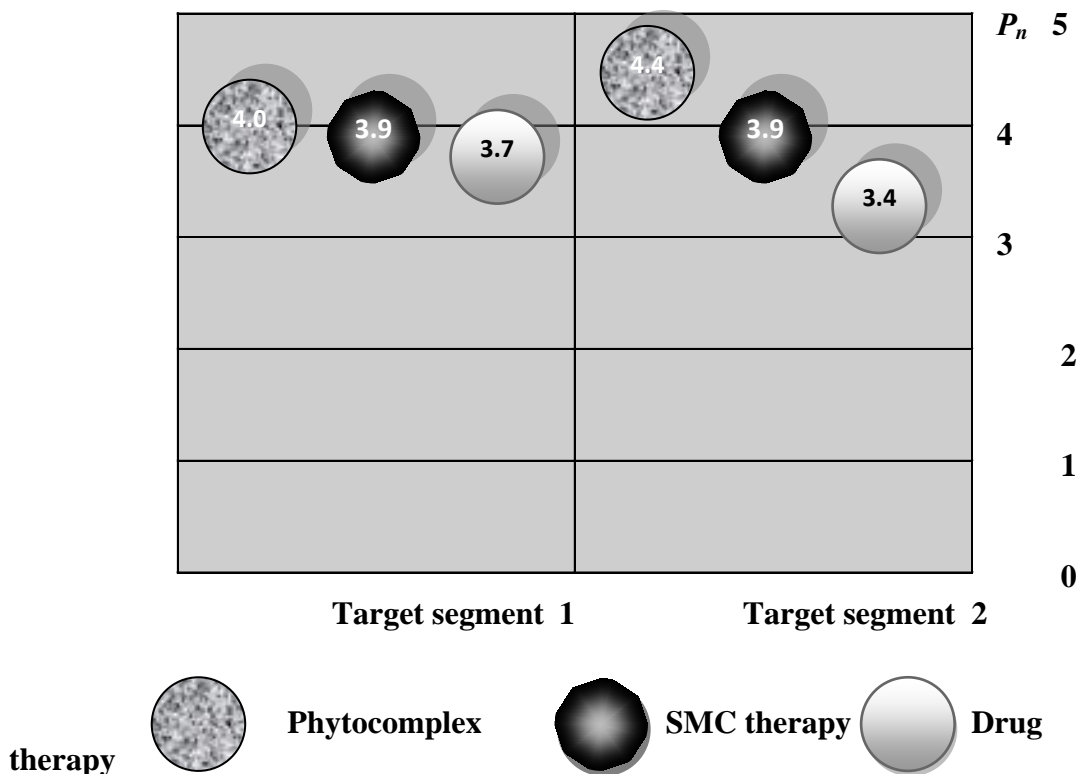


Figure 2. Map of Positioning a New Rehabilitation Method – Phytocomplex SMC-Electrophoresis in Two Target Segments ( $P_n$  – a Combined Parametric Index)

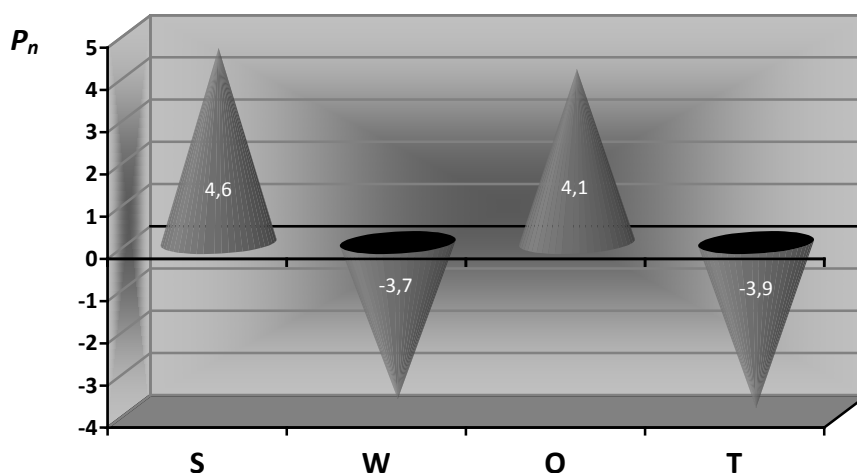


Figure 3. Results of SWOT analysis by the degree of favoring the introduction of the new method of rehabilitation in medical practice – phytocomplex SMC-electrophoresis ( $P_n$  – composite parametric index, S – strengths, W – weaknesses, O – opportunities, T – threats)

### CONCLUSION

1. The possibility of an expert assessment of the competitiveness of the rehabilitation methods under development by using the results of clinical and preclinical researches is shown through the example of the phytocomplex SMC-electrophoresis. It is recommended to include not only doctors but also pharmacists and marketers in the expert group. Possible parameters for assessing competitiveness, including market indicators, were defined. Higher competitiveness of the new method - phytocomplex SMC-electrophoresis - was determined as compared with SMC therapy and drug therapy ( $P_n = 4.2$ ,  $P_n = 3.8$ ,  $P_n = 3.5$ , respectively).
2. The results of positioning confirmed the high competitive advantages of the new method –phytocomplex SMC-electrophoresis - as compared with the traditional methods of rehabilitation. The most important parameters included high efficiency of the method ( $R_i = 17$ ;  $P_i = 0.46$ ); longer remission ( $R_i = 16$ ;  $P_i = 0.43$ ); and prominent regression of clinical symptoms (for example, joint pain:  $R_i = 15$ ;  $P_i = 0.42$ ). It was determined that the new method was preferred by patients aged 60-75 (segment 2).
3. Based on the results of assessing competitiveness and positioning, strengths and weaknesses of the new method of rehabilitation – phytocomplex SMC-electrophoresis – as well as opportunities and threats for its introduction into practical health care were defined and structured. SWOT analysis showed the considerable prevailing of the method strengths over weaknesses ( $P_n = 4.6$  and  $P_n = -3.7$ , respectively), and minimal prevailing of favorable environmental opportunities over threats ( $P_n = 4.1$  and  $P_n = -3.9$ , respectively). It is recommended to use the principles of differentiated marketing when developing a strategic plan for introducing the new method to the market, and to create a separate version of the marketing complex that fully takes into account strengths of the new technology for target segment 2.

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