



## A MULTI-MODAL INTEGRATIVE FACIAL PROTOCOL: CLINICAL EVALUATION OF A 10-STAGE SYSTEM COMBINING MECHANICAL, ENZYMATIC AND OXYGEN-BASED THERAPIES

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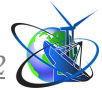
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**Abstract.** *The article is devoted to the clinical evaluation of the author's multi-component protocol for facial skin care, which combines mechanical, enzymatic and oxygen-oriented therapies within a 10-step system. The purpose of the study is to consider innovative protocol approaches to facial skin care, which are based on a combination of different therapy approaches. During the scientific study, general scientific methods of cognition were used: analysis, synthesis, systematization, comparison, modeling and empirical observation. The results of the study show that modern non-surgical skin care methods, in particular innovative multi-component protocols, demonstrate high efficiency in correcting the signs of photoaging, improving microrelief, tone and complexion. It is proven that the combined Hollywood Facial Signature protocol, which includes enzymatic exfoliation, micro- and hydrodermabrasion, oxygen therapy, LED therapy, atraumatic cleansing and the use of individualized cosmetic formulas, provides a consistent, controlled and multifactorial effect on the skin. Within one session, deep cleansing, stimulation of regeneration, normalization of sebum secretion, improvement of microcirculation and increased hydration are achieved. It has been shown that microdermabrasion promotes renewal of the stratum corneum, increases skin permeability to active substances and stimulates neocollagenesis in the dermis. Of particular value are oxygen mesotherapy and oxybrasion, which activate cell metabolism, provide an antibacterial effect and reduce inflammatory manifestations without prolonged recovery. The complex action of these technologies allows you to achieve a quick aesthetic result, including reducing puffiness, improving the oval of the face and even skin tone. The practical significance of the study is to create an effective, adaptive and commercially viable skin care protocol that can be implemented in aesthetic medicine institutions.*

**Keywords:** *microdermabrasion, enzymatic peeling, oxygen therapy, care protocol, rejuvenation.*

### Introduction

Trends in skin care services in recent years show a steady increase in the popularity of cosmetic procedures among women and men, which determines the active development of the aesthetic medicine market and the introduction of innovative technologies to improve the quality of results. According to the American Med Spa Association [10], about 88% of medical SPA clients in the USA are women, while the share of men remains smaller, but shows an annual trend of increase. As of 2025, the number of medical cosmetology institutions in the USA will reach about 10,000, and their annual growth rate is approximately 19%, which confirms the high rates of development of this area [10]. Financial indicators indicate its high economic



performance: the average monthly income of one medical SPA exceeds \$ 120,000, and the annual turnover is about \$ 2 million, which indicates a stable demand for professional cosmetic services. Thus, the aesthetic medicine market shows growth not only in the number of institutions and their profitability, but also in the speed of technological innovations.

The reasons for such rapid dynamics are ambiguous. On the one hand, the demand for beauty services is growing, as the rule that a beautiful woman has a higher social status and is happier is taking root in society. On the other hand, the growth in demand is due to the growth of skin problems and diseases. According to studies by Heng A.H.S., Chew F.T. [7], the increase in the frequency of cases of problematic skin, in particular acne, is due primarily to a combination of uncontrolled factors - hereditary predisposition, increased body mass index and skin type. In the studied populations, overweight/obesity was associated with an increased risk of acne, and the presence of acne cases in parents - with an increased risk for offspring.

Economic development of the industry contributes to the search for effective and innovative technologies for providing skin care services. In particular, modern skin care protocols are increasingly being implemented as integrated complexes that combine mechanical, enzymatic, oxygen, and other types of therapies, providing a more personalized and highly effective approach to correcting aesthetic imperfections.

### **Literature Review**

The issue of skin care is widely described not only in the special cosmetology literature, but also sufficiently studied at the scientific level. Important are general review articles, in particular the study by Farber, S. E., Chim, H., & Brown, E. N. [4], articles devoted to evidence-based methods, among which the work of Hari-Raj, A., Barlow, R. J., & Al-Niaimi, F. [6] is of particular value. In the scientific literature, there is a clear thematic differentiation of modern skin care methods, which can be conditionally grouped into several main areas. Area No. 1: physiological and physicochemical methods of skin cleansing, among which microdermabrasion [3], oxybrasion [2], and the effect of enzyme peels [5], [11]. Area No. 2: hardware rejuvenation techniques, which include intense pulsed light and fractional non-ablative



laser resurfacing [8]. Such procedures, as shown by clinical studies, allow achieving a noticeable effect without surgical intervention, which is consistent with the general trend towards a non-invasive approach in cosmetology. In this context, the analysis of modern protocols presented in [4, 6] is relevant.

The use of oxygen in local procedures attracts special attention, which is considered a promising direction of therapy [1], although it requires further clinical confirmation and standardization. Expert industry literature, including modern online publications such as the report “The 2022 Medical Spa State of the Industry Executive Summary in Context” [10], which outlines market trends, changes in demand for procedures and new customer requests, serves as a supplement to scientific sources.

Despite the sufficient amount of literature on this topic, there is a lack of systematic material on the use of combined technologies, and therefore, using various methods of scientific knowledge, innovative methods were analyzed that combine different technologies into one in order to obtain a better effect.

***The purpose of the article*** is to consider innovative protocol approaches to facial skin care, which are based on a combination of different therapy approaches.

### **Research Results**

Non-surgical rejuvenation and improvement of skin condition is rapidly spreading as a main service of cosmetology establishments. This approach now encompasses a wide range of technologies that work with different skin structures by stimulating regeneration, increasing collagen synthesis, improving the quality of the extracellular matrix, and controlled tissue damage/remodeling [4]. The level of evidence in the field of non-surgical facial procedures remains heterogeneous and limited: botulinum toxin injections are the most studied, for which there is a significant number of randomized controlled trials, which allows for reasonable conclusions about efficacy and safety. Other injection techniques, including dermal fillers and deoxycholic acid, have a smaller evidence base: most studies have small samples and uncontrolled designs, and the use of deoxycholic acid outside the submental area has been practically not studied. Regarding chemical peels, laser and energy-based remodeling, microneedling and PRP therapy, although they are characterized by a good safety profile and broad clinical



indications, standardized protocols, unified outcome criteria and long-term RCTs are still lacking, which complicates the formation of evidence-based clinical guidelines in these areas [6].

The main methods of non-surgical procedures include: basic topical care (sunscreens, antioxidants, retinoids, acids), medical exfoliation procedures (hydrodermabrasion, microdermabrasion), chemical peels of various depths, laser remodeling (ablative and non-ablative, fractional and non-fractional systems), as well as methods of tightening and compacting soft tissues – radiofrequency (RF) and ultrasound technologies (see Table 1.)

Table 1 – Overview of methods of non-surgical facial rejuvenation

Type of method	Clinical features
Sunscreens	Prevent further photoaging; do not reverse existing changes; mineral filters (ZnO, TiO <sub>2</sub> ) with high photostability and broad-spectrum protection are the most optimal
Antioxidants (vit. C, E, polyphenols)	Reduce oxidative stress, stimulate collagen synthesis and epidermal renewal; effectiveness depends on the stability and concentration in the formula
Retinoids (tretinoin – the “gold standard”)	Increase the thickness of the epidermis and dermis, improve texture and wrinkles; erythema and peeling may occur at the beginning of treatment; effects are dose-independent, so even minimal concentrations are effective
AHA / “acids” (glycolic, lactic, citric)	Exfoliate surface layers and stimulate collagen remodeling; the effect depends on the concentration, irritation is possible; should not be combined with ascorbic acid to avoid its inactivation
Medical facials / hydrodermabrasion	Combine mechanical exfoliation, vacuum extraction, and infusion of active agents; improve skin thickness, hydration, reduce pores and hyperpigmentation; minimal risks and comfortable procedure
Microdermabrasion	Mechanical resurfacing with mild effects on wrinkles and dyschromia; safe for darker phototypes; enhances the penetration of topical products; requires repetition
Chemical peels: superficial, medium, deep	Allow controlled damage at various dermal depths: from correcting mild texture irregularities to improving scars; the effect and recovery period are directly related to the depth
Laser resurfacing (CO <sub>2</sub> , Er:YAG, IPL, Nd:YAG)	Stimulate neocollagenesis and improve tone and texture; ablative methods are the most effective but involve the longest downtime; fractional techniques offer shorter recovery but require a series of sessions
Radiofrequency lifting (monopolar/bipolar, RF microneedling)	Heats the dermis to tighten and lift tissue, with minimal risk of hypo-/hyperpigmentation; gradual effect with peak results visible within 6–12 months
Ultrasound lifting (MFU, Ultherapy®)	Focused heating of deep structures (up to the SMAS), resulting in tissue lifting; best suited for mild to moderate ptosis; discomfort may occur during the procedure

Note: Systematized based on research [4]



In general, all methods demonstrate effectiveness in correcting signs of aging, however, maximum and stable results are achieved by a combination of topical therapy, regular photoprotection and hardware techniques, taking into account the individual characteristics of the skin and the patient's tolerance. Let's consider the most common methods. Let's start with mechanical care.

Mechanical care. There are several options for mechanical skin care used to correct its condition and maintain healthy functioning. One of the most common methods is microdermabrasion – mechanical exfoliation (controlled removal of the superficial layers of the stratum corneum of the epidermis). The main essence of this method is that it is performed according to a standardized protocol and acts as a basic mechanical stage of cleansing. The procedure is aimed at correcting the manifestations of photoaging, improving the microrelief of the skin, as well as significantly increasing its permeability for active ingredients used during or after the procedure. Microdermabrasion is performed using hard abrasive particles, such as aluminum oxide crystals, which allow for precise control of the depth of exfoliation and evenness of the skin surface without damaging its deeper structures. Clinical data demonstrate that patients aged 40–65 years with photodamage after a weekly series of procedures show an improvement in texture, reduced dryness, increased smoothness and brightness of the skin, as well as a decrease in the severity of fine wrinkles. In the dermis, increased microcirculation and stimulation of neocollagenesis are observed, which indicates the activation of regenerative processes. Thus, microdermabrasion provides a comprehensive clinical effect, combining mechanical renewal of the skin surface with enhanced action of topical agents, and is an effective component of modern non-surgical rejuvenation protocols [3]. In addition to microdermabrasion, mechanical skin care methods also include enzymatic therapies based on controlled biological exfoliation of the surface layers of the epidermis. One of the most developed and described approaches is the enzymatic peeling protocol, presented in a professional article by S. Gonçalves [5]. This procedure is aimed at breaking down the protein structures that hold the corneocytes of the stratum corneum, which ensures the delicate removal of non-viable cells and uniform renewal of the skin surface. The basis of the



method is the use of plant proteolytic enzymes – papain from papaya fruits, bromelain from pineapple and ficin from figs, which have high specificity of action, low antigenicity and are well tolerated by the skin, including sensitive or high phototypes. The procedure is implemented according to a clear protocol using a powdered enzyme mask, which includes plant enzymes, sorbent and indifferent components - in particular rice starch, lactose, kaolin, titanium dioxide, as well as approximately 1% papain as an active agent. Before starting the care, the skin condition is assessed to exclude contraindications. After cleansing the face with a mild cleanser, the powder is mixed with a small amount of water to the consistency of a cream, which allows it to be evenly applied with a brush to the treatment area. The enzyme mixture remains on the skin for up to fifteen minutes, during which the intercellular proteins of the stratum corneum are hydrolyzed and the corneocyte adhesion is softened. After the exposure time, the mask is removed with warm water, avoiding mechanical trauma to the skin surface [5].

Unlike chemical peels, the enzymatic method does not require long recovery and can be used even during periods of increased insolation, which expands its capabilities in complex protocols for the care of photodamaged or sensitive skin. Thus, enzymatic exfoliation is a rational mechanical-biological approach that provides a safe and effective improvement in skin quality without aggressive intervention in its structure [5].

Let's move on to enzymatic types of therapy.

Enzymatic exfoliation is considered a modern approach in cosmetic science that provides physiological skin renewal due to the ability of proteolytic enzymes to break down bonds between corneocytes. Unlike acidic agents that require aggressive pH conditions, enzymes act selectively on the protein structures of the stratum corneum, without injuring the living layers of the epidermis. That is why such formulas demonstrate high tolerance, allow use for sensitive and reactive skin, as well as during periods of active insolation. Advanced stabilization technologies, including microencapsulation, nanodelivery, and polymer protection of enzymes, ensure the preservation of their activity and prolonged action in cosmetic products. Hence the trend towards the creation of multi-enzyme formulas that combine exfoliating, anti-



inflammatory, antioxidant, and antimicrobial effects, providing a comprehensive effect on the skin barrier properties [11].

Table 2 – Features of the use of enzymatic therapy

Enzyme	Action and application
Bromelain (from pineapple)	Breaks down proteins in the stratum corneum, promoting gentle exfoliation; has anti-inflammatory effects by modulating cytokines; shows antibacterial activity against <i>P. acnes</i> , making it beneficial in protocols for oily and inflamed skin.
Papain (from papaya)	Possesses strong proteolytic activity and promotes deeper renewal of the stratum corneum; helps reduce hyperkeratosis and post-inflammatory pigmentation; supports dermal healing and remodeling; commonly used in products targeting pronounced texture and photo-damaged skin.
Ficin (from fig latex)	Provides gentle exfoliation without irritation; offers antioxidant and antimicrobial potential; ideal for sensitive skin, including rosacea and reactive conditions where other methods may be too harsh.

Note: Systematized by the author based on the source [11]

In modern cosmetic formulas, proteolytic enzymes are considered as a high-tech tool for restoring the skin barrier properties, controlling textural disorders and maintaining an even tone without the risk of irritation [11].

Oxygen-oriented methods are another effective direction for skin improvement. These technologies are taking an increasingly important place in modern aesthetic dermatology, as they provide a non-invasive effect on cellular metabolism, microcirculation and inflammatory processes.

Topical oxygen therapy ensures the delivery of high-purity oxygen – up to 96% – to the surface layers of the skin, where it is absorbed by the epidermis and dermis. As noted by Bennardo et al. [1], this approach activates cellular metabolism, promotes faster skin healing, reduces irritation and has a pronounced anti-inflammatory effect. Oxygen stimulates neoangiogenesis by inducing VEGF, increases blood supply and provides antibacterial effect through the formation of reactive oxygen species that destroy pathogenic microorganisms. From a practical point of view, the therapy enhances the effectiveness of traditional dermatological agents and is used as an additional component of the treatment of androgenic alopecia, telogen effluvium, mild and moderate forms of acne, psoriasis and atopic dermatitis. Oxybrasion, on the other hand, combines mechanical exfoliation with local oxygen exposure, providing a double effect: cleansing the superficial stratum corneum and creating an oxygen environment



unfavorable for *Cutibacterium acnes*. According to Chilicka et al. [2], the procedure is performed with a jet of saline solution (0.9% NaCl), supplied under oxygen pressure, while cooling the skin and minimizing discomfort. Additionally, there is stabilization of the secretory activity of the sebaceous glands, improvement of microcirculation and a moderate anti-inflammatory effect. Studies have shown that regular oxyabrasion in patients with mild to moderate acne helps reduce the number of inflammatory elements and improves the overall condition of the skin without a long rehabilitation period. In addition to treating acne, oxyabrasion can be used for post-acne scars, excessive keratinization and age-related skin changes.

Topical oxygen therapy and oxyabrasion are methods with different mechanisms of action, the first mainly enhances the healing properties of topical agents and tissue regeneration, while the second expands the spectrum of effects through mechanical exfoliation and normalization of sebum secretion.

Chemical peels remain one of the key methods of non-invasive skin rejuvenation, demonstrating a steady increase in clinical use despite the advent of laser technologies. According to Pathak A.K., Mohan R., Rohrich R.J. [9], modern peeling protocols are based on significant dermatological advances that have provided higher safety, predictability and the ability to clearly control the depth of exposure depending on the clinical goal - correction of wrinkles (rhytides), skin tone evenness and treatment of dyschromia. The evolution of techniques proposed by leading researchers has allowed the use of superficial, medium-deep and deep peels with an optimal efficacy profile and minimal risks.

The innovative development of aesthetic dermatology is increasingly based on combined care protocols that provide a simultaneous effect on various clinical manifestations of photoaging. Such protocols combine different energy-oriented technologies in order to achieve a comprehensive rejuvenating effect without a long recovery period. The study by J. Knight and R. Koutsoukos [8] demonstrated the effectiveness of the combined use of intense pulsed light (IPL) and non-ablative fractional laser (NAFL), which is implemented within a single procedure and allows you to simultaneously correct pigmentation, telangiectasias, wrinkles and loss of skin



elasticity. According to the evaluation results, more than 90% of patients noted an improvement in texture, a decrease in the severity of wrinkles and pigmentation manifestations already one month after the course of procedures, and approximately 70% assessed the result as “very good”.

A separate advantage of this approach is minimal trauma: the procedures are characterized by low pain and a short period of social recovery, which is on average about 1.5 days, after which the patient fully returns to the usual rhythm of life. Thus, the combined use of IPL and NAFL, proposed by Knight & Koutsoukos, demonstrates the high clinical feasibility of modern integrated rejuvenation technologies, providing a safe, effective and scientifically based mechanism for improving the qualitative characteristics of the skin in the conditions of modern cosmetology [8].

Combined protocols in modern aesthetic dermatology can be both standard clinical schemes and completely original methods that integrate several technological approaches at once. One such example is the Hollywood Facial Signature technique, developed by O. Zhenzherukha. It combines mechanical, enzymatic, hardware and oxygen stages of exposure, supplemented with professional cosmetics of its own design, which provides deep cleansing, stimulation of regeneration, even skin tone, improvement of lymphatic drainage and an immediate "red carpet" effect.

The procedure includes 10 consecutive stages, adapted to the individual needs of the client's skin, which ensures control of the intensity of each stage and a high level of safety, consider them in Table 3

Table 3 – Hollywood Facial Signature - author's protocol (O. Zhenzherukha)

Step	Name	Key feature
1	Double Cleanse	Personalized “skin mapping cleanse” technique
2	Enzyme Exfoliation	Gentle enzymatic renewal without irritation
3	Microdermabrasion	Controlled depth of mechanical exfoliation
4	HydroDermabrasion	Simultaneous cleansing, infusion, and hydration
5	Extractions	Atraumatic “soft pressure” cleansing
6	Oxygen Mesotherapy	Oxygen pressure for active ingredient delivery
7	LED Therapy	Customized light spectrum
8	HydroJelly Mask	Enhanced hydration and moisture retention
9	Face & Shoulder Massage	Lymphatic drainage combined with facial sculpting
10	Targeted Serums + Moisturizer + SPF	Proprietary cosmetic product formulations



The technique is distinguished by the fact that it combines 10 technological effects in one protocol, provides minimal trauma, no long-term recovery and a pronounced aesthetic effect after the first session, including reducing swelling and improving the oval of the face. The use of proprietary dermatocosmetic formulas increases the stability and predictability of results, while the ability to adapt to any skin type makes the protocol universal. The commercial value is confirmed by the implementation of the technique by other salons and the availability of training programs for specialists.

**Conclusions** The multi-component integrated facial skin care protocol is a modern comprehensive approach that combines various therapeutic technologies to achieve maximum clinical effect without invasive intervention. Such a protocol is based on a multifactorial effect on the skin - from the correction of dyschromia and textural disorders to the stimulation of neocollagenesis and improvement of barrier properties. Mechanical, enzymatic and oxygen techniques are key components of such protocols. Microdermabrasion provides controlled removal of the stratum corneum and increases the permeability of active substances, demonstrating a pronounced improvement in microrelief and stimulation of neocollagenesis in patients with photoaging [3]. Enzymatic peels based on proteolytic enzymes (papain, bromelain, ficin) provide delicate exfoliation and a high safety profile, including for sensitive skin [5], [11]. Oxygen techniques, in particular topical oxygen therapy and oxybrasion, improve cellular metabolism, reduce inflammation, contribute to the normalization of sebum secretion and reduce the bacterial load on the skin [1], [2]. The combination of these approaches allows for comprehensive correction of the manifestations of photoaging and inflammatory processes of the skin.

The author's protocol Hollywood Facial Signature (O. Zhenzherukha) is an example of the practical implementation of an integrated approach, combining 10 consecutive stages of mechanical, enzymatic, hardware and oxygen exposure using its own high-tech cosmetic formulas. This protocol is characterized by universality in terms of skin types, a high level of safety, a minimal recovery period and a guaranteed aesthetic result after the first procedure, which confirms its clinical and commercial effectiveness in modern cosmetology.



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