

Table IV-2-3. Skincare treatments to prevent and treat acne

OBJECTIVE	TOOLS AND TREATMENTS
Removal of comedones (deep cleansing)	<ul style="list-style-type: none">• Comedone extraction
Removal of surface impurities (superficial cleansing)	<ul style="list-style-type: none">• Cosmetic cleansers• Brossage• Desinkrustation• Ultrasonic cleaning• Gas-liquid peeling
Normalization of keratinization process	<ul style="list-style-type: none">• Chemical peeling
Restoration of the rlocal egulation of sebum production	<ul style="list-style-type: none">• Cosmetic products (phytoestrogens, retinol and its esters, azelaic acid, zinc preparations)• Mesotherapy (regulatory peptides)• Placentotherapy• PRP therapy
Modulation of skin immunity, anti-inflammatory effect	<ul style="list-style-type: none">• Cosmetic products (regulatory peptides, nicotinamide, beta-glucan, pro- and prebiotics, topical carboxytherapy)• LLLT (low-level laser radiation in the red and infrared spectrum)• Mesotherapy (regulatory peptides, amino acids, nucleic acids, antioxidants, and anti-inflammatory substances)
Antibacterial effect	<ul style="list-style-type: none">• Cosmetic products (herbal extracts with antiseptic action (chamomile, calendula, celandine, gammamelis, arnica, etc.), essential oil of tea tree; benzoyl peroxide)• Ozone therapy• Phototherapy (blue light)

large cysts, it may be necessary to curettage the cavity remove the pus. After cleansing, the skin is treated with antiseptics for several days to avoid infection around the removed comedon.

As for **vacuum extraction**, it understandably cannot guarantee the complete extraction of comedones, and the risk of damaging the surrounding tissue remains high. In addition, it cannot be used with couperose and increased vascular fragility.

Removal of comedones provides rapid clinical improvement. This simple method gives the most splendid result both in the initial stages and in the later ones. Except, of course, for nodules and cysts, when you have to resort to surgical methods to evacuate the pus.

Superficial cleansing (exfoliation)

The surface of oily skin is more contaminated than skin with normal or reduced sebum production. It's not just excess sebum and dirt buildup but also conglomerates of horny flakes that didn't leave the skin surface in time.

Special cleansers with mild surfactants and pH 4,0–5,0, used both in the procedure and at home (see Part IV, section 1.2.1), have been developed to clean oily and acne-prone skin. They can be presented as milk, foam, and mask. For exfoliation, you can use enzymatic cleansers — solutions or liquid gels containing enzymes that break down organic substances (proteins, fats, carbohydrates).

For superficial cleansing of the skin with acne, the following treatments are also used:

- **Brossage:** mechanical exfoliation with special brush heads. It is indicated in the initial non-inflammatory stages of acne.
- **Desincrustation:** pre-wetted with an alkaline solution, skin is treated with a galvanic current. This involves a chemical reaction of saponification of fatty acids, which loosens greasy conglomerates and facilitates their subsequent removal with water;
- **Ultrasonic peeling:** loosens the *stratum corneum* and exfoliates horny scales through the mechanical action of ultrasonic waves. The method is perfectly integrated into any cosmetic protocol, conducted after make-up removal, cleansing milk, and combined with toning. The general effects of the ultrasonic wave (anti-inflammatory, anti-bacterial, defibrotic, reparative and regenerative, hydrating) during the session are poorly expressed because the ultrasonic waves used parameters do not penetrate the depth of tissue and are reflected from the surface.
- **Gas-liquid peeling:** the impact on the skin with compressed gas and an aqueous solution of various active substances. During the

treatment, the skin is treated with finely dispersed droplets, which hit the skin surface at high speed and «knock out» the upper horny scales, helping them leave the skin.

Proper daily cleansing at home is essential for oily and acne-prone skin care. But periodically, it is necessary to carry out a deeper cleansing, and it should be done in a skincare specialist's office. The main thing is to avoid traumatizing the *stratum corneum*, as the skin barrier is already very weakened.

2.3.2. Chemical peeling

Acne-prone skin is susceptible because its defenses are compromised at the *stratum corneum* level and the local immune system. Being a damaging procedure, chemical peeling can worsen the already poor skin's ability to defend itself and resist external influences. Inflamed skin must be treated with particular care. In this case, the chronic inflammatory fire will reignite and cause even more damage, including the appearance of pigmentation spots (post-acne pigmentation).

In addition, inflammatory mediators, particularly histamine, increase sebum production. This makes the need for anti-inflammatory measures in acne therapy and the contraindication of damaging procedures even more apparent.

As for the non-inflammatory acne (comedonal), the chemical peeling is acceptable, but only if it is superficial and not traumatic.

Keratolytic peeling

The following keratolytic substances are used:

- 1) salicylic acid and liposalicylic acid;
- 2) resorcinol;
- 3) trichloroacetic acid (TCA);
- 4) phenol.

Today, TCA and phenol are prohibited for use because of their high cytotoxicity and ability to penetrate the *stratum corneum* rapidly. **Salicylic acid**, on the other hand, although a derivative of phenol, passes poorly through the *stratum corneum*; its main action is concentrated on the surface and within

the *stratum corneum* (see Part IV, section 2.2.2). The concentration of salicylic acid in the peel formulation is between 15–30%. Salicylic peeling is recommended for seborrhea, seborrheic dermatitis, non-inflammatory forms, and mild inflammatory forms of acne.

Resorcinol is another phenol derivative. It is also a keratolytic agent, but its chemical activity and penetration capacity are higher than salicylic acid's. Resorcinol is much less common than salicylic acid because of its higher irritant potential. It can be found in disinfectants at a concentration of around 1%, which is not enough for peeling, but enough to disinfect the surface. Resorcinol is included in Jessner peels at a concentration of about 14%. In addition to resorcinol, salicylic acid (14%) and lactic acid (14%) are present in the classic Jessner peel formulation. The active ingredients are dissolved in ethanol (95%). In modified Jessner peels, resorcinol is changed to citric acid or glycolic acid, for example, to reduce the risk of side effects. Jessner peels are mainly used to correct post-acne.

The current trend is to combine salicylic acid with alpha hydroxy acids (AHAs) in one formulation. This allows you to significantly expand the therapeutic possibilities of salicylic acid.

The exfoliation of horny masses occurs during the keratolytic peeling session: a whitish plaque (frost) appears on the skin — it is denatured proteins and detached horny scales. Sometimes a few days after the treatment, there can be a light scaling, which is a consequence of the inactivation of the horny layer enzymes by the keratolytic agent. However, this secondary scaling is not always; it depends on the concentration of the keratolytic agent, time of the chemical peel exposure, skin condition, and post-peel care.

Acid peeling

Peel treatment performed by acutely acidifying the skin is called an acid peeling. The active components of acid peel products (acid peels) are alpha hydroxy acids (AHAs). These substances contain two functional groups — hydroxy (–OH) and carboxy (–COOH) (**Fig. IV-2-7**), most of them are water-soluble.

Acid peels are aqueous solutions or gels. The action of acid peel is to shock violation of the pH gradient through the *stratum corneum*, resulting in an abrupt halt of all enzymes responsible for keratinization and desquamation (**Fig. IV-2-8**). The exfoliating power of an acid peel is related to its pH: the lower it is, the stronger the skin scaling. To stop the effect of an acid peel, the pH must be restored, and a neutralizer is used for this purpose.

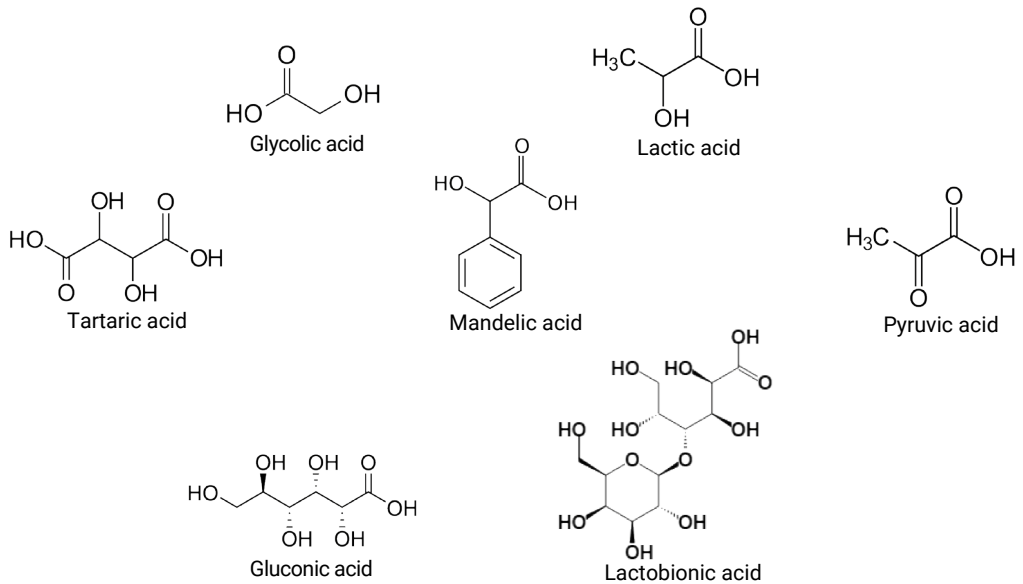


Fig. IV-2-7. Alpha and polyhydroxy acids in cosmetic products for oily and acne-prone skin

The result of enzymatic failure in the *stratum corneum* is the formation of abnormal corneocytes and intercellular lipid structures. The skin tries to shed them as quickly as possible to make space for new normal barrier structures. This does not happen immediately; visible desquamation is noticeable a few days after the treatment.

The following AHAs have proven to be the most popular in the case of acne thanks to their moisturizing ability; primarily, lactic acid saturates the *stratum corneum* with water. This property is required in case of oily skin, which is also dry. The diagnosis of «oily dry skin» at first glance sounds strange. But it is true: skin that «suffocates» from too much sebum often suffers from a lack of water in the *stratum corneum*. In acne, the water-holding and barrier structures of the *stratum corneum* are severely compromised, and, as a result, the *stratum corneum* is poorly hydrated. Lactic acid, a component of natural moisturizing factor (NMF), penetrates the *stratum corneum* and retains within it the water molecules so necessary to maintain the structural and functional integrity of the skin barrier.

Polyhydroxy acids — lactobionic and gluconic acids, as well as gluconolactone, a derivative of gluconic acid — «work» similarly. These large molecules

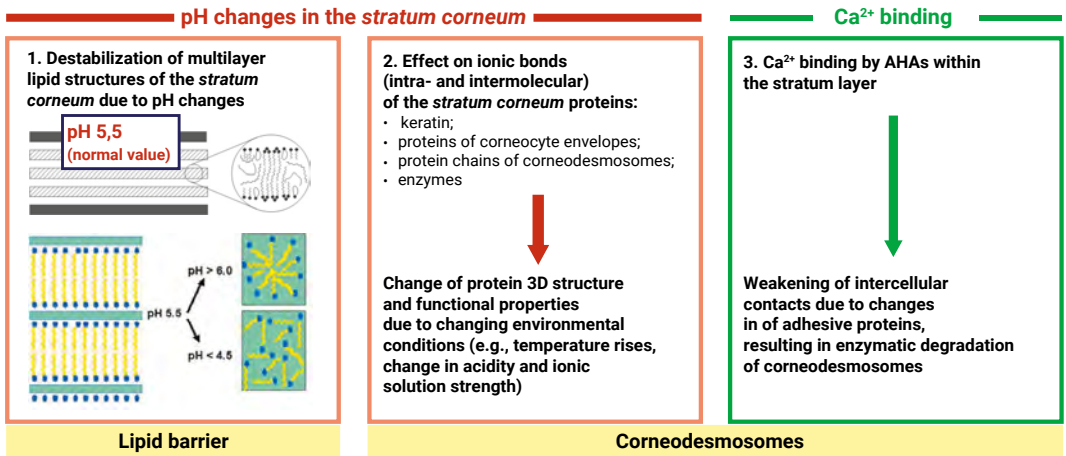


Fig. IV-2-8. Mechanism of action of AHAs

do not go beyond the *stratum corneum* but concentrate in it and moisturize it thanks to the binding of water molecules.

Almond acid, known for its bactericidal properties and keratolytic action, is found in formulations designed for oily skin prone to acne.

You can find **tartaric acid** in formulation for post-acne. It lightens the skin and increases its elasticity.

As **glycolic acid**, the smallest among hydroxy acids, it quickly penetrates through the *stratum corneum* (if it is also damaged, as in acne, penetration occurs very quickly). It reaches the living skin layers, which react with inflammation. Therefore, glycolic peels are not indicated for acne. It is acceptable to use low-concentration (<10%) glycolic acid formulations with a pH of at least 4–4.5 as home care to soften the *stratum corneum* and keratinized sebaceous gland orifices. Still, such products often contain glycolic acid in combination with other AHAs (usually lactic) and salicylic acid.

An alternative to glycolic peels for mild acne characterized by open and closed comedones can be pyruvic acid peels, called Red Peels, because of the intense red color. **Pyruvic acid** is a highly lipophilic keto acid that quickly penetrates the sebaceous glands and is characterized by its keratolytic, sebo-static, bacteriostatic, restructuring, and depigmenting action. In the skin, pyruvic acid can be converted to lactic acid. 50% pyruvic acid (pH is about 1–2) can treat comedonal and papulopustular forms of acne. According to the literature, undesirable reactions and complications of pyruvic acid peeling