Synergy effects: Pre- and aftercare for aesthetic procedures

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Aesthetic operations are booming. It is more or less about modelling the whole body. Skin care plays a decisive role in restoring intact skin after surgery. But even before the operation, the right choice of skincare can ensure good skin condition and thus contribute to an optimal result for patients and clients.

Like clothing and cosmetics, the desire for aesthetic changes to the body is also subject to fashion trends. Role models from film and culture and psychological factors such as self-esteem play a part in this.
Breast augmentations and reductions are very often on the wish list. Tissue tightening and wrinkle removal fulfil the desire for a youthful appearance, especially in old age. Corrections to the lips, nose, eyes, ears, thighs and genitals are also very popular.

Comprehensive offer

For potential patients, the range of services available online is overwhelming, as any doctor who has completed a medical degree can now practise aesthetics and advertise accordingly.
This has prompted plastic surgeons, whose professional title is protected after generally 6 years of specialist training, to present themselves more and more as "specialists in plastic surgery" with the addition "and aesthetic surgery". Without this specialist training, however, aesthetic doctors are limited to non-surgical treatments such as:

- Radiotherapy: Blue light (acne). IR light (warts), cold red light (photodynamic therapy with alpha-aminolaevulinic acid)
- Liposuction, injection lipolysis (fat-away injection)
- Laser treatments: Teleangiectasias, haemangiomas (blood sponges), age spots, fibromas, warts, scars, tattoos, hair removal
- Botulinum toxin A treatments for hyperhidrosis
- Wrinkle injections with botulinum toxin A, polylactic acid, endogenous fat (lipofilling), hyaluronic acid and derivatives
- Skin tightening (facelift)
- Mesotherapy and derma roller treatments
- Peelings with alpha-hydroxy acids (AHA), beta-hydroxy acids (salicylic acid and 2-hydroxy-5-octanoylbenzoic acid) and still trichloroacetic acid.

In individual disciplines such as gynaecology, dermatology and ENT, various specialist aesthetic operations are possible – sometimes in conjunction with around 2 years of additional training.
Regardless of the underlying training of the doctors, there is no defined medical indication for aesthetic treatments and procedures. Therefore, health insurance companies do not reimburse the costs. Sick leave is not permitted under labour law in the case of aesthetic operations.

Preventive skin care

The same principle applies to aesthetic treatments as before indication-specific procedures: the skin should be in as good a condition as possible and prepared accordingly.

- If invasive incisions are to be expected, an intact skin barrier is assumed and an antimicrobial lotion is applied. Lamellar, barrier-active skin care and vitamin creams can be used at least 1-2 weeks beforehand and disinfectant lotions in the form of 60-80% alcohol or isopropanol immediately before the procedure, or alcoholic solutions with antiseptic substances such as Polyaminopropyl Biguanides (INCI). The latter can also be used after the treatment if there is a risk of high alcohol concentrations causing irritation – e.g. during mesotherapy and derma roller treatments.
- Post-inflammatory hyperpigmentation (PIH) is to be expected in the case of cuts and punctures and stimulation of melanin formation in the case of laser treatments. Conspicuous pigmentation can be safely prevented by pre- and prompt post-treatment of the affected

areas with liposomal Ascorbyl Phosphate (INCI).

- Even with perfect disinfection, a balanced microbiome of the entire surrounding skin must be ensured in order to largely rule out subsequent infections with facultative pathogens or external germs. In addition to preservative-free, barrier-active creams, sparingly applied, paraffin-free oleogels are also suitable for this purpose, which contain few or no such counterproductive additives due to the absence of a water phase.
- The use of physiological substances with a regenerative effect such as cell membrane components (phosphatidylcholine, phosphatidylserine) and vitamins (vitamin B_3, vitamin E) is already recommended during pre-treatment.
- Compositions that are similar to the skin barrier, i.e. containing (phyto)sterols, fatty acids and ceramides, are suitable for the cream bases. The fatty acids can be bound to phosphatidylcholine, which physically mimics the lipid bilayers of the skin barrier. Including the minimum number of excipients, these conditions correspond to the requirements of adjuvant corneotherapy in the skin care accompanying the medical indication. If additional topical medications are used in aftercare, the same basic compositions should be aimed for; this eliminates the need for a changeover. Ideally, the ingredients of the creams should correspond to the European Pharmacopoeia (Ph. Eur. 11) and/or the Drug Master Files (DMF) deposited with the health authorities. Combinations of cosmetic and pharmaceutical active ingredients are then also possible.

Aftercare

Aftercare is adapted to the procedure and the expected healing process as well as the individual skin situation. As changing compositions are required for this purpose, modular systems have proven their worth, whose individual components allow for higher concentrations of active ingredients, among other things.

To rule out counterproductive processes, care should be taken to minimise the use of additives and to use physiological components throughout. Aqueous, mostly astringent products such as green and black tea, epigallocatechin gallate (EGCG), witch hazel and D-panthenol are suitable for wounds that are still oozing.

Liposomal formulations are suitable due to their higher penetration rates as such or in combination with non-liposomal, aqueous solutions and extracts. If the skin surface is dry, creams or lipid-rich oleogels can also be used sparingly. Typical skin situations and the associated skin care are listed as examples in Table 1.

When used correctly, pharmaceutical preparations, including their side effects, can be largely or completely avoided during aftercare.

Table 1: Skin care and cosmetic active ingredients (examples) after aesthetic treatment

Skin situation*)	Base used**)	Active ingredients contained in the base	Principle of action***)
Burns (e.g. after laser), chemical burns (e.g. after acid peeling)	Nanodispersion	Vegetable oils rich in linoleic and linolenic acid	Formation of anti-inflammatory fatty acid metabolites
Oozing surfaces	Aqueous lotion or liposomes	Witch hazel extract, epigallocatechin gallate (EGCG) (with low pH value), tannins, gallic acid derivatives	Adstringent
Inflammation	Aqueous lotion, nanodispersion	D-panthenol, boswellic acids, phosphatidylserine, α-bisabolol (active ingredient of camomile), aloe vera, extracts of ribwort plantain, berberine, echinacea	Antibacterial, anti-inflammatory, e.g. through protease inhibition (Boswellia). For further active ingredients see "Burns"
Infection	Aqueous lotion	Azelaic acid (against anaerobes), salicylic acid, rosmarinic acid, betulinic acid (antiparasitic)	Antimicrobial
Oedema	Liposomes or nanodispersion	Kigelia, butcher's broom, horse chestnut and horsetail extracts	The saponins in the extracts stabilise superficial blood vessels and tighten the connective tissue
Barrier disorder	Barrier cream	Amino acids (analogue NMF), superficial film formation with long-chain hyaluronic acid	Regeneration of the bilayer structure and the moisturising capacity of the skin barrier
Connective tissue disorder	Liposomes	N-acetyl-4-hydroxyproline, ascorbyl phosphate, N-acetyl glucosamine	Stimulation of collagen and hyaluronic acid formation. For further active ingredients see "Oedema"
Scarring	Nanodispersion	Vitamin A ester****), in later stages: acid peeling or dermal needling	Stimulation of regeneration, possibly also of microcirculation: caffeine (liposomal)
Hyperpigmentation	Liposomes	Ascorbyl phosphate, tranexamic acid – if necessary, in combination with niacinamide (vitamin B_3)	Inhibition of melanin formation
Hypopigmentation	Nanodispersion	Phosphatidylserine, vitamin A ester****)	Regeneration, e.g. if there is a risk of scarring
Itching	Aqueous lotion and/or barrier cream	Urea, allantoin, monoethanolamides of long-chain fatty acids, ceramides, D-panthenol	Amidic substances have an antipruritic effect
Unwanted hair growth after hair removal	Nanodispersion or barrier cream	Isoflavones	Local oestrogenic effect

Legend:

*) This column also includes unintended, optional side effects of aesthetic treatments.

**) Indication of the optimal penetrating bases in each case. Alternatively, aqueous lotions can be used instead of liposomes (carriers for hydrophilic active ingredients) and oil-in-water emulsions (O/W) or even vegetable oils (e.g. linseed, kiwi, rose hip oil) can be used instead of nanodispersions (carriers for lipophilic active ingredients), although all of these have a slower effect. If emulsifiers are used, attention must be paid to physiological compatibility and degradability – e.g. use of mono- and diglycerides instead of non-degradable synthetic emulsifiers. An emulsifier-free variant of barrier creams are phosphatidylcholine-based oleogels. They have the ad-

vantage that they are more or less free of additives, are only initially occlusive and have good penetration.
***) Dominant effect.
****) Alternatively dermatological: Vitamin A acid.

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