# Skin care before and after surgery

**published in medical Beauty Forum 2015 (1), 34-37**

Adjuvant skin care plays a significant role in the context of aesthetic surgery. Adequately administered it helps accelerate the recovery process, discontinue pharmaceutical medication at an earlier stage and has a lasting positive effect on the surgery results.

Professor Kligman's corneotherapy[1] has shown that clinically significant effects are not only achieved with topical pharmaceuticals but also originate from common skin care ingredients[2] – provided that they are adapted to the respective skin condition. In the context of aesthetic surgery there are two potential applications for corneotherapy alias dermatological skin care:

- Corneotherapy before and after the surgical intervention
- Adjuvant corneotherapy – in addition to the topical treatment with pharmaceutical drugs

Adjuvant corneotherapy has proved successful in the case of inflammatory skin reactions such as neurodermatitis and cheilitis.[3]

## Before surgery: optimizing the skin condition

Skin care with appropriate cosmetic base creams for a period of at least 4 weeks before the surgical intervention helps optimize the skin's condition. Optimal in this context means that the skin barrier is healthy, skin hydration and transepidermal water loss (TEWL) are physiologically balanced and the natural recovery of the skin is working properly. This can be achieved with compounds that are adapted to the natural skin barrier which mainly consists of fatty acids, ceramides and cholesterol. Non-physiological, non-biodegradable emulsifiers and paraffins are not compatible with this concept since they cause a counterproductive wash-out effect or interfere with the natural recovery of the skin. With regard to an absolutely non-irritating skin care, it is important to omit allergenic additives such as the preservatives listed in the annex of the German Cosmetic Directive (KVO) as well as perfumes with their various components.

## Change of preparations: the cream base is essential

Before and after invasive procedures, the cosmetic preparations often are replaced by pharmaceutical formulations. It is obvious that only the respective active agents should be changed but not the cream bases. In the daily practice, however, it is not that easy to stick to this principle since, incredible as it sounds, not a single one of the pharmaceutical cream bases complies with the above mentioned physiological conditions[4]. The dermatological skin care is way ahead of the cream base concept used in the pharmaceutical practice. Nevertheless, the pharmacist also is allowed to use cosmetic base creams with pharmaceutical active agents.[5] Said permission is documented in the German Pharmacy Operations Ordinance (Apothekenbetriebsordnung – ApBetrO) and applies in cases where test certificates and instructions regarding the identity verification are available. Separate test certificates according to the GMP guidelines (Good Manufacturing Practice) are not required since the cream bases are not classified as pharmaceutical active agents according to § 11 of the German Pharmacy Operations Ordinance (ApBetrO).[6] Hence the GMP guidelines for cosmetic products of the German Cosmetic

[1] Lübbe J, Evidence-Based Corneotherapy, Dermatology 2000;200:285-286
[2] Tabata N, O'Goshi K, Zhen YX, Kligman AM, Tagami H, Biophysical assessment of persistent effects of moisturizers after their daily Applications: Evaluation of Corneotherapy, Dermatology 2000;200:308-313
[3] Suvorova K, Korneotherapie der Hautkrankheiten, die von der Störung der Epidermis begleitet werden (in Russisch), Les Nouvelles Esthétiques (Russische Version) 2004;4:28
[4] Lautenschläger H, Synergien nutzen – Wie Wirkstoffe und Cremebasen Kosmetik und Pharmazie verbinden, Kosmetische Praxis 2010;3:10-12
[5] Kresken J, Icke K, Herstellung von Hautcremes in der Apotheke – Die Apothekenbetriebsordnung ist nicht immer als Rechtsgrundlage maßgeblich, DermoTopics 2013 (1)
[6] Apothekenbetriebsordnung, Pharmazeutische Zeitung 2012;12;Supplement:1-54

Directive are sufficient.
Follow-up treatments with cosmetic base creams containing pharmaceutical antibiotics or antiseptics are a typical example in the context of aesthetic interventions – followed by base creams with identical composition and essential and anti-iinflammatory omega 3 or omega 6 fatty acids that are permitted for cosmetic use. Also 5-lipoxygenase inhibitors in the form of specific boswellia extracts (frankincense) are beneficial for this purpose.

**After the intervention: support the natural recovery of the skin**

In order to largely suppress infections and scar formation and abbreviate follow-up treatments, the natural recovery of the skin with the help of dermatological skin care preparations has priority after the intervention. Depending on the condition of the surgical wound it has to be decided whether already lipid-enriched creams as applied before surgery can be administered or whether aqueous active concentrates (sera) should be preferred at first. The second option certainly is useful if tissue fluid still is leaking around the periphery of the wound. In this case, it is suggested to apply phosphatidylcholine based liposomes with water-soluble active agents as well as aqueous nanodispersions with lipophilic active agents – phosphatidylcholine is the main component of the natural plasma membranes. The following cosmetic active agents are suitable:

- **Astringent substances:** witch hazel extract, tannins and gallic acid derivatives
- **Stimulating wound healing and barrier recovery:** D-panthenol, niacinamide (vitamin $B_3$), liposoluble vitamins and their derivatives
- **Stimulating the collagen formation:** vitamin C phosphate, particular peptides
- **Anti-itching substances:** urea, allantoin, long-chained fatty amides such as palmitic acid monoethanolamide
- **Moisturizers:** amino acids of the NMF (Natural Moisturizing Factor) and urea

Liposomes and nanodispersions have an excellent spreading potential and hence can be formulated without respective additives. Due to the perfect penetration and permeation features, a small amount already is sufficient and penetrates rather fast. The sensorial properties are quite convenient due to the watery consistency.
In order to reduce tensions in the wound area, the applied active agents should as soon as possible be complemented with lipids. The simplest way is to apply base creams after the sera have penetrated. The active agents can alternatively be integrated into the base creams.

**Adapting the treatments**

In order to individually and progressively adapt the active agents, their mixtures among themselves or mixtures with base creams to the individual skin conditions, modular systems are needed. Lamellar compounds provide maximum compatibility – this also applies for base creams.[7] They offer a large variety of possible applications in aesthetic surgery, particularly with regard to breast corrections, lip modifications, face liftings and the removal of wrinkles or subcutaneous fat. They also prove beneficial in the treatment before and after the removal of smaller veins, hair and hyperpigmentation as well as after laser-based scar therapy; also curative chemical peelings belong to the potential applications.

The corneotherapeutic procedures have to be adapted to the specific intervention particularly in cases where the above mentioned follow-up treatments for a recovery are accompanied by certain constraints:

- **Infections:** The adjuvant skin care offers a broad range of antimicrobial substances such as azelaic acid (5-alpha reductase inhibitors), clotrimazol (cosmetics is not allowed to promote the antimycotic effect for skin care purposes!), salicylic acid, rosmarinic acid and betulinic acid.
- **Inflammations:** The following substances are beneficial as a preventive measure but also in the follow-up treatment: alpha linolenic acid (linseed and kiwi oil), gamma linolenic acid (evening primrose and borage oil), 3-acetyl-11-keto-ß-boswellic acid (5-lipoxygenase inhibitor from frankincense extracts), α-bisabolol (active agent of chamomile), aloe vera.
- **Scars:** Wounds and sutures may develop atrophic, hypertrophic, sclerotic or fibrous scars and keloids depending on the individual reaction of the skin. Sometimes scars require long-term follow-up treatments in the form of medical peelings, microdermabrasion or dermal needling. In addition to mas-

[7] Lautenschläger H, Biodegradable lamellar systems in skin care, skin protection and dermatology, SOFW-Journal 2013;139 (8):2-8

sages with oils with essential fatty acids and cosmetic peelings with abrasive bodies and fruit acids, the corneotherapeutic treatment focuses on the local application of vitamin A derivatives. Vitamin A esters show high regenerative potential already in low doses due to the enzymatic formation of vitamin A acid (cf. tretinoin) in the skin.
The above mentioned recovery boosting substances have synergetic effects. Caffeine and green tea can help to stimulate the microcirculation.

- **Pigment disorders:** After the surgery, pigment disorders can appear in all their variants, such as for instance as hypopigmention of scars because they lack melanin, or in the form of hyperpigmentations after inflammations[8] or laser treatments. In the case of hypopigmentations, recovery boosting active agents are the preferred cosmetic treatment while in the case of hyperpigmentations tyrosinase inhibitors such as vitamin C phosphate, antioxidative polyphenols and tranexamic acid are administered as a preventive measure and also follow-up treatment. The effect of tranexamic acid which simultaneously helps reduce the redness caused by the superficial blood vessels is enhanced with niacinamide (vitamin $B_3$)[9].
- **Oedema and connective tissue disorders:** Saponins from kigelia, butcher's broom, horse chestnut and horsetail extracts stabilize the superficial blood vessels and tighten the connective tissue.

## Decorative cosmetics

If make-up or lipstick shall be applied after an aesthetic intervention in the facial area, emphasis should be put on a maximum tolerance of the ingredients but also on their compatibility with the base preparations used under the decorative cover. The still on-going recovery process should by no means be affected.[10]
Camouflaging covers for instance should be limited to public appearances of the individuals concerned. They have the effect of adhesive bandages on the skin under which the recovery of the skin barrier more or less comes to a halt. In the cosmetic practice, the perfect camouflage can only be realized with occlusive paraffins or long-chained silicones because high concentrations of pigments have to be stabilized. Frequently a shaded powder or green concealer already can be beneficial in attenuating visible redness.
In comparison to the past, the pigments added in today's decorative cosmetics are no longer a problem in toxicological respect as usually iron oxides, titanium oxide, kaolin and mica are used.

## Conclusion

Dermatological skin care (corneotherapy) - systematically applied - can be a valuable complementary element of aesthetic surgery and efficiently replace conventional topical pharmaceuticals. The treatment is perfectly coordinated: prevention, therapy and recovery.

Dr. Hans Lautenschläger

[8] Lautenschläger H, Haut ohne Makel – Wirkstoffe und Wirkstoffsysteme, medical Beauty Forum 2014;5:32-35

[9] Lee do H, Oh IY, Koo KT, Suk JM, Jung SW, Park JO, Kim BJ, Choi YM, Reduction in facial hyperpigmentation after treatment with a combination of topical niacinamide and tranexamic acid: a randomized, double-blind, vehicle-controlled trial, Skin Res Technol. 2014;20(2):208-12

[10] Lautenschläger H, Dermopharmazie – Dekorative Kosmetik für die Problemhaut, Pharmazeutische Zeitung 2008;8:28-30