

# Crossing borders – on the boundaries of cosmetic skin care

published in Beauty Forum 2010 (8), 27-29

There is only a smooth transition from problem skin to pathological skin conditions. Although it is not the job of professional cosmeticians to diagnose skin diseases, it is essential to know the borderlines. Otherwise there is a risk of getting into conflict with health legislation.

**P**roblem skin or medical indication? That is the question arising in the case of barrier disorders. Dry skin belongs into the category of problem skin and can be identified by a high TEWL (transepidermal water loss) and low skin hydration, easily measurable with the Corneometer® probe. If the barrier disorder already is much more pronounced and shows signs of inflammation and pruritus, it may be atopic skin (neurodermatitis). Both cases demand for an appropriate and individually adapted skin care. In case of neurodermitic skin, it is recommended to seek medical advice as this condition definitely is a medical indication.

The appropriate cosmetic care of dry skin is a lipid-enriched cream enhanced with a NMF (Natural Moisturizing Factor, as e.g. amino acids, urea) and hyaluronic acid. Recommended for the atopic skin also are additional active agents with anti-inflammatory potential (essential fatty acids, boswellia) possibly also components to soothe the itching (as e.g. urea, allantoin and other amides). All these substances sound like medical drugs, however, they still belong to the cosmetic area as long as the cosmetic skin care abstains from ex-

PLICITLY promising the healing and soothing of diseases.

Adequate skin care concepts should go beyond this scope, though: emulsifiers may intensify barrier disorders, for instance. Hence, they should be avoided just as allergenic preservatives and perfumes which easily may penetrate through the disordered skin barrier. Mineral oils also are counterproductive as they form superficial films on the skin and thus impede its natural recovery.

So far, we are still discussing within the principles of corneotherapy. As experience teaches, a systematic selection of cream components and cosmetic active agents will lead to a significant recovery of the skin condition, sometimes even to a freedom from symptoms. The theory is scientifically supported by very successful clinical studies (cf. references hereto).

The following survey shows a summary of medical indications, pharmaceutical active agents and the adjuvant cosmetic skin care based on cosmetic active agents – the list is not intended to be exhaustive, though. It should be mentioned that the target-oriented approach may frequently switch the focus from the pharmaceutical treatment towards an adequate skin care.

Indication	Pharmaceutical active agents (partly also oral applications)	Cosmetic active agents
<b>acne (oily skin)</b> oily skin with efflorescences and comedones	benzoyl peroxide, retinoids, erythromycin and other antibiotics, azelaic acid, linoleic acid, salicylic acid, hormones, fruit acids, zinc oxide	phosphatidylcholine (liposomes) <sup>1)</sup> , linoleic acid, salicylic acid, azelaic acid, betulinic acid, vitamin A, yeast, ribwort, berberine
<b>acne (dry skin)</b> low fat skin with efflorescences and comedones; from the 3 <sup>rd</sup> decade of life	benzoyl peroxide, retinoids, erythromycin and other antibiotics, azelaic acid, linoleic acid, salicylic acid, hormones, fruit acids, zinc oxide.	vegetable triglycerides <sup>3)</sup> , phosphatidylcholine (nanodispersions) <sup>1)</sup> , linoleic acid, salicylic acid, azelaic acid, betulinic acid, amino acids (NMF), vitamin A, yeast, ribwort, berberine, phytohormones (red clover, soybean)

Indication	Pharmaceutical active agents (partly also oral applications)	Cosmetic active agents
<b>actinic keratosis</b> pre-malignant chronic solar damage	diclofenac, 5-fluorouracil, 5-aminolevulinic acid, photodynamic therapy (PDT)	boswellia
<b>allergic contact eczema (contact dermatitis)</b> erythema, blisters, nodules, weeping blemishes after contact with allergens as e.g. nickel	corticoids, antihistamines, local anaesthetics	vegetable triglycerides <sup>3)</sup> and phytosterols to stabilize the skin barrier, avoiding dry skin
<b>couperosis</b> weak connective tissue with vascular dilation	retinoids, antibiotics (minocycline, doxycycline, metronidazole), azelaic acid	vegetable triglycerides <sup>3)</sup> , linseed oil, evening primrose oil, azelaic acid, betulinic acid, phosphatidylcholine (liposomes, nanodispersions) <sup>1)</sup> , echinacea, butcher's broom
<b>decubitus (bedsores)</b>	D-panthenol, antibiotics, anti-inflammatory and re-fattening cream bases (prevention)	non-aqueous base of vegetable triglycerides <sup>3)</sup> , phosphatidylcholine, hydrogenated phosphatidylcholine <sup>1)</sup> , and phytosterols (prevention)
<b>dry skin</b> skin barrier disorder: increased TEWL, low skin hydration	urea, linoleic acid, re-fattening cream bases	vegetable triglycerides <sup>3)</sup> , linoleic acid, ceramides, CM-glucan, amino acids (NMF), phosphatidylcholine (nanodispersions) <sup>1)</sup> , hydrogenated phosphatidylcholine (DMS base) <sup>2)</sup> , aloe vera, hyaluronic acid, CM-glucan
<b>gamma-radiation</b> erythema and dry skin due to radiotherapy	anti-inflammatory and re-fattening cream bases	phosphatidylcholine (nanodispersions) <sup>1)</sup> , evening primrose oil, linseed oil, amino acids (NMF), CM-glucan, urea, aloe vera, boswellia, echinacea
<b>hyper pigmentations</b> increased melanin formation	chemical peelings, hydroquinone	ascorbyl phosphate (vitamin C-phosphate); vitamin A, azelaic acid, phosphatidylcholine (liposomes, nanodispersions) <sup>1)</sup> , extracts: mallow, peppermint, cowslip, lady's mantle, veronica, lemon balm, ribwort
<b>ichthyosis (fish scale disease)</b> disorder of corneocyte desquamation	retinoids, urea (keratolytic)	vegetable triglycerides <sup>3)</sup> , phytosterols, vitamin A, phosphatidylcholine (nanodispersions) <sup>1)</sup> , hydrogenated phosphatidylcholine (DMS-base) <sup>2)</sup>
<b>inflammation (dermatitis)</b> (cf. eczema, dermatoses, neurodermatitis etc.)	antibiotics, antimycotics, antihistamines, immunosuppressive agents, corticoids, chamomile, calendula, D-panthenol	evening primrose oil, linseed oil, boswellia, D-panthenol, phosphatidylcholine (nanodispersions) <sup>1)</sup> , echinacea
<b>laser treatments</b> pre- and follow-up care to impede melanin formation	---	ascorbyl phosphate (vitamin C-phosphate), phosphatidylcholine (liposomes) <sup>1)</sup> , extracts: mallow, peppermint, cowslip, lady's mantle, veronica, lemon balm, ribwort
<b>neurodermatitis</b> inflammatory barrier disorder with pruritus, with varying degree of severity	antiseptics, corticoids, immunosuppressive agents, antihistamines, urea (skin hydration, pruritus), polidocanol (pruritus), evening primrose oil, D-panthenol	vegetable triglycerides <sup>3)</sup> , linseed oil, evening primrose oil, linoleic acid, phytosterols, ceramides, urea, allantoin and other amides, phosphatidylcholine (nanodispersions) <sup>1)</sup> , boswellia, hydrogenated phosphatidylcholine (DMS base) <sup>2)</sup>
<b>perioral dermatitis</b> small red or inflamed nodules/blisters around the mouth	erythromycin, minocycline, metronidazole, azelaic acid, tannins	boswellia, phosphatidylcholine (nanodispersions) <sup>1)</sup> , azelaic acid, green tea, hamamelis, echinacea, butcher's broom

Indication	Pharmaceutical active agents (partly also oral applications)	Cosmetic active agents
<b>perianal barrier disorder</b> sore areas on the buttocks, frequently caused by excessive body hygiene	antiseptics, hamamelis, D-panthenol, anti-inflammatory and re-fattening cream bases	non-aqueous base of vegetable triglycerides <sup>3)</sup> , phosphatidylcholine <sup>1)</sup> , hydrogenated phosphatidylcholine <sup>2)</sup> , phytosterols
<b>psoriasis</b> exfoliative dermatitis with inflammatory skin condition due to increased and accelerated cornification (hyperkeratosis)	dithranol (cignolin), salicylic acid, urea, tar preparations, corticoids, calcipotriol, retinoids, cyclosporin A, psoralen, fumaric acid, fumaric acid ester	evening primrose oil, linseed oil, phosphatidylcholine (liposomes, nanodispersions) <sup>1)</sup> , fumaric acid, urea
<b>rosacea</b> erythema and connective tissue disorder	retinoids, antibiotics (minocycline, doxycycline, metronidazole), azelaic acid	vegetable triglycerides <sup>3)</sup> , linseed oil, azelaic acid, betulinic acid, phosphatidylcholine (nanodispersions) <sup>1)</sup> , vitamin A
<b>scars</b> indurations of the connective tissue with varying degree of severity	retinoids, heparin, chemical peeling	vitamins A, C, E, coenzyme Q10, D-panthenol, phosphatidylcholine (nanodispersions) <sup>1)</sup> , hydrogenated phosphatidylcholine (DMS-base) <sup>2)</sup>
<b>striae</b> scarred tissue caused by hyperextension	vitamin A acid, trichloroacetic acid (chemical peeling)	prevention: rose hip seed oil, linseed oil, vitamin E, coenzyme Q10, phosphatidylcholine (nanodispersions) <sup>1)</sup>
<b>sun burns and burns</b> (erythema)	antiseptics, NSAID, D-panthenol	linseed oil, linoleic acid, D-panthenol, phosphatidylcholine (nanodispersions) <sup>1)</sup> , echinacea, boswellia
<b>toxic degenerative eczema</b> chronic cumulative toxic contact eczema	corticoids, allantoin, hamamelis, antiseptics, D-panthenol, anti-inflammatory and re-fattening cream bases	vegetable triglycerides <sup>3)</sup> , evening primrose oil, linseed oil, phytosterols, hydrogenated phosphatidylcholine (DMS cream base) <sup>2)</sup> , ceramides, urea, allantoin, D-panthenol, hamamelis

Annotations to table:

- 1) Phosphatidylcholine itself is a very effective active agent due to its linoleic acid content. On the other hand, it serves as an intensifying agent for the penetration of polar aqueous agents (in liposomes) and lipophilic agents (in biologically degradable nanodispersions). In particular fat oils as e.g. linseed oil, evening primrose oil as well as fat-soluble vitamins become better available for the metabolism and more acceptable for the customers in terms of sensorial properties.
- 2) Besides triglycerides, phytosterols, squalan and ceramides, hydrogenated phosphatidylcholine is a texturing component of emulsifier and preservative free DMS base creams with skin-related membrane structure.
- 3) Vegetable triglycerides can be neutral oils (medium-chain triglycerides), avocado oil, wheat germ oil, almond oil, or the like. Specific triglycerides like evening primrose oil (main active agent: gamma-linolenic acid), linseed oil (main active agent: alpha-linolenic acid), rose hip seed oil (linoleic acid & alpha-linolenic acid) are listed separately.
- 4) The active agents listed in the table above are used separately or in adequate combinations depending on the specific skin condition.

If the medical treatment with pharmaceutical active agents is combined with an adapted skin care, we refer to adjuvant corneotherapy. Quite often even identical active agents are used,

however, with differing functional properties. But what is to be said against the use of azelaic acid (up to 1 per cent) as a consistency substance in a cosmetic skin care product for the rosacea skin? It can be assumed that specifically in liposomal preparations this component will synergistically contribute to the recovery process. An overview on pharmaceutical active agents in cosmetic preparations has been recently published in *Kosmetische Praxis* 2010 (3), 10-13. There is an optimal interaction, if both pharmaceutical and cosmetic area apply the same base creams. Another alternative may be the use of sera respectively tinctures instead of cream bases, particularly in case of weeping or heavily fattening skin areas.

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