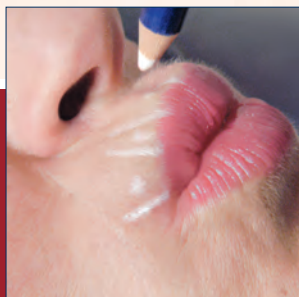
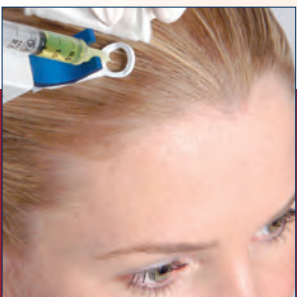


# Illustrated Atlas of Esthetic Mesotherapy

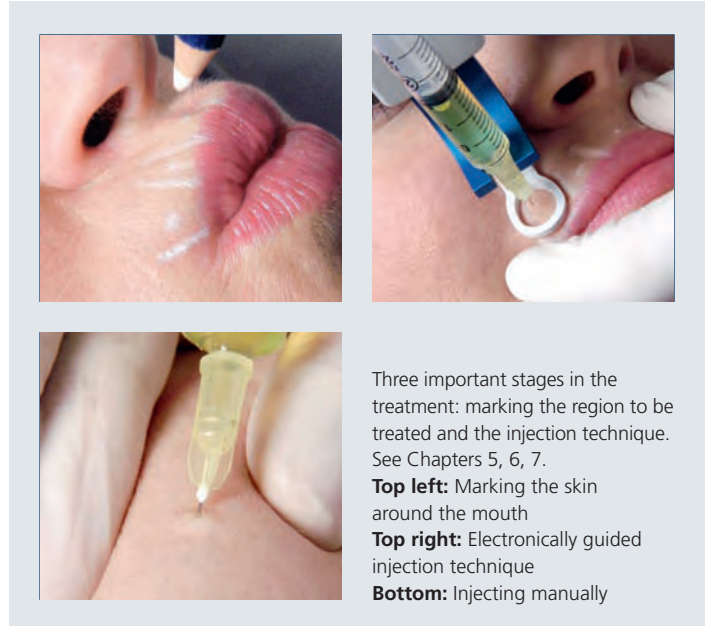
**Active Substances | Dosage | Administration**



**Britta Knoll  
Gerhard Sattler (Ed.)**

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The revitalization cocktail injected into the scalp in MesoHair leads to stimulation and regeneration of the hair roots. See Chapter 9.2.

## The active substances

These days, an individual's general appearance can be optimized without appearing artificial, by combining a variety of individually selected active substances and injecting them locally. European esthetic perception demands a relaxed, naturally youthful radiance. We like to receive compliments, but we do not want people to suspect us of having "work" done. Consequently, there is every reason for a gradual, long-term strategy, where it is preferable to start with a milder mixture, and then, if required, to follow it up with stronger active substances or concentrations later on in the treatment.

### Note

Many years of positive experience and also some study results are available for many of the procedures, such as Mesolift, lipolysis or MesoHair. The choice of materials in this book, be it instruments or injectable agents, does not claim to be comprehensive. The treatment protocols are individually devised; ideally, they address not only the objective pathophysiology of each case, but also the wishes of the patients themselves.

## 2.1 Individual active substances in esthetic mesotherapy

### 2.1.1 Active substances in Mesolift

If the desired skin rejuvenation effect is to be achieved, we need the correct choice and combination of active substances matching the pathophysiology of each case. Knowledge of the pharmacological properties of many of the potential individual agents is therefore an essential prerequisite.

### Description of selected active substances

#### Monomethyl trisilanol salicylate

(E.g. *Conjonctyl® in F, Silicor Toskani*)

Organic silicon is found here in a polymeric structure of silicic acid salts. Silicon is the most important natural semi-conductor; in the body's tissues, it acts as a nanospacer and catalyst in a variety of reactions. Uses include stimulation of collagen synthesis (not in salicylate allergy), tightening and regeneration of the skin, as a possible replacement for procaine and as a universal adjuvant for the improvement of connective tissue structures. It is also available linked to DMAE for skin tightening and firming (DM-silk), improving the latter's local tolerability.

#### Sodium pyruvate

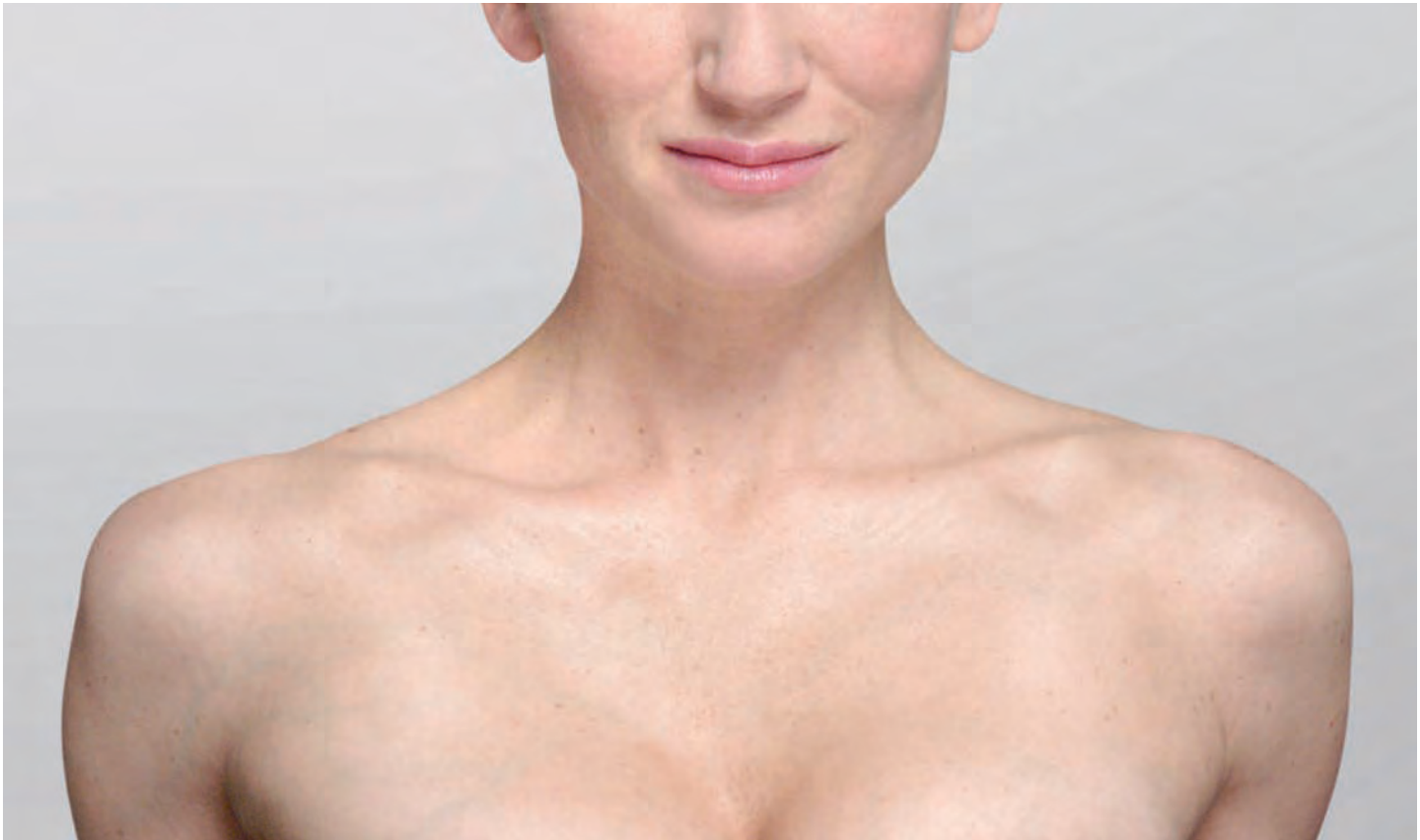
(E.g. *in Cocktail anti-aging Toskani*)

This  $\alpha$ -keto-derivative of lactic acid encourages amino acid and dermal collagen synthesis. It is an antioxidant (ROS destruction) and stimulates cell metabolism.

*Uses:* Particularly for sun-damaged skin, smoker's skin DMAE for skin tightening and firming (DM-silk), improving the latter's local tolerability.

### Overview – active substances in Mesolift

Carrier solutions	PROCAINE 1–2 % or lidocaine 1–2 %, NaCl 0.9% Conjonctyl® (monomethyl trisilanol salicylate)
Biostimulants	Non-cross-linked hyaluronic acid, Na-DNA Collagen, elastin, retinol, glycolic acid
Stem cell activators of plant origin	Proliferation of epidermal stem cells $\uparrow$ , growth factors (IGF-1, bFGF, VEGF, TGF- $\beta$ 1)
Herbal remedies	Ginkgo biloba, Centella asiatica
Vitamins	A, B, C, E, dexpanthenol
Building blocks for protein synthesis	Amino acids for collagen and elastin production $\uparrow$ , e.g. taurine Ubiquinone (coenzyme Q 10), glutathione, pyruvate
Regulation of muscle tone	Muscle tone $\downarrow$ (relaxation): botulinum toxin (POM), argireline Muscle tone $\uparrow$ (stretching): DMAE (anti-sagging)



Mesolift is most frequently used on the face, neck and cleavage/neckline area.



Once the individual components of the treatment have been selected, they are mixed in the correct way immediately before use on the patient.

in for the standard setting. The pressure is built up on continuous mode (C) and the injector then switched to nappage mode for Mesolift. The maximum rate is 300 injections per minute. For infiltration treatments, the machine is left in C mode, which allows parameters such as the injection depth or flow rate to be set. The Pistor 5 is much lighter and quieter to use and also has considerably improved battery technology.

### 5.3 Mesotherapy injection techniques

Injection techniques in mesotherapy differ from other techniques, and their practical application must therefore be learned. The injections are given either manually or with injector guns; the latter should be given preference, particularly for use on the face in Mesolift. The angle of entry of the needle determines the penetration depth. In Mesolift, the skin is merely touched, and the skin stabilizer used only as a visual guide. If the skin stabilizer is fitted vertically, it will not be possible to use the nappage technique, but only one-by-one injections or infiltrations.

Linear or round multi-injectors or Dermojet® devices (in which the liquid is shot into the skin with the aid of compressed air) must never be used in mesotherapy. Work only with sterile, single-use materials.

#### 5.3.1 Intracutaneous injection (depth of injection $\leq 1$ mm)

Doses of  $\geq 0.1$  ml produce a welt (see Figure). Welts cause pain due to overstretching of the epidermal skin layers. They take several hours to several days to subside fully.

#### 5.3.2 Epidermal injection (depth of injection $\leq 1$ mm)

In the epidermal “dragging” or point-by-point technique, doses of only 0.01 ml (single drops) are applied per injection, i.e. no welts appear.

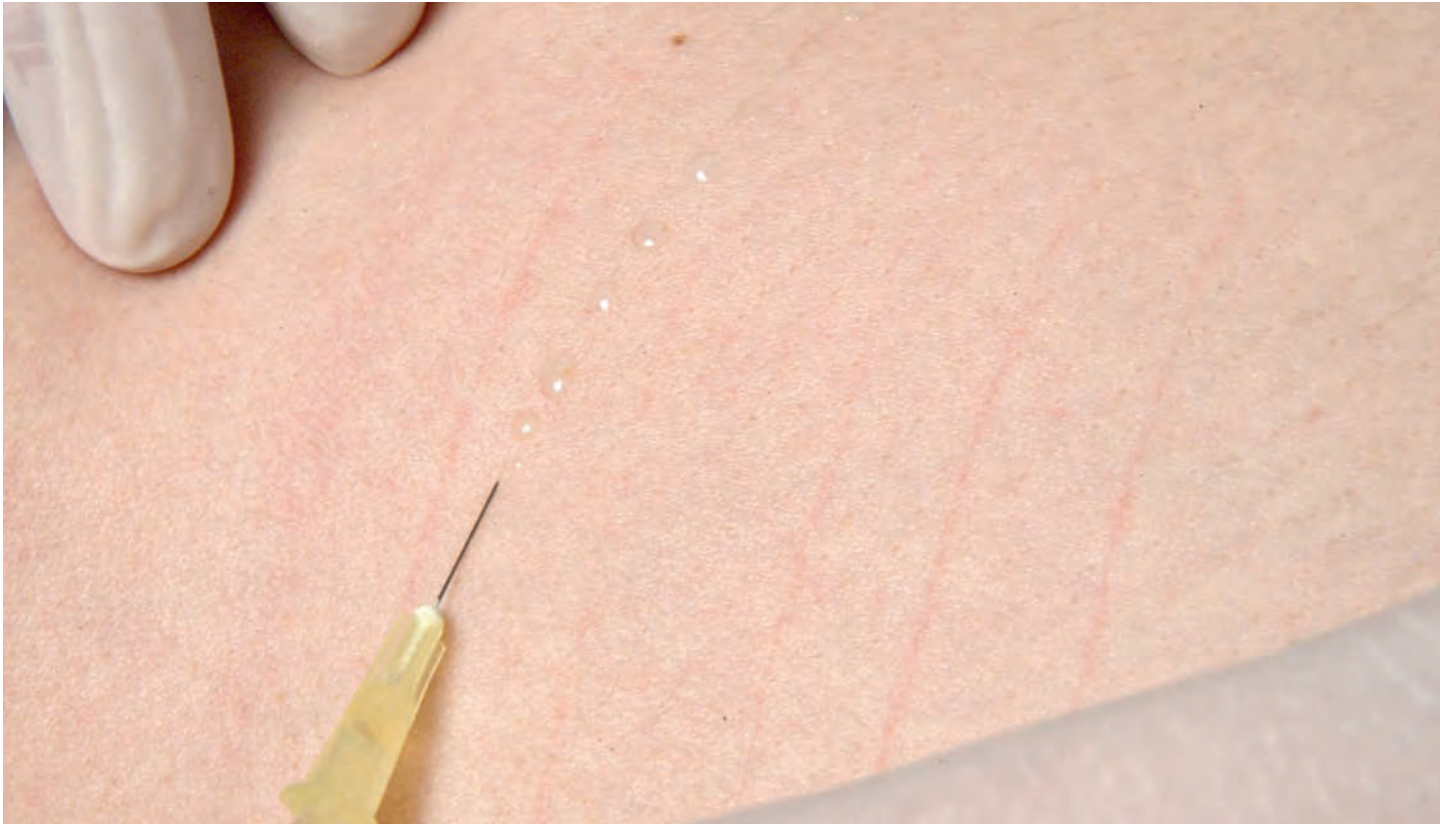
The ultrafine Mesorelle needle makes it possible to administer almost painless injections and it is used particularly on fine, sensitive skin areas, e.g. lips, skin around the eyes, fingers and feet. In sensitive individuals, it is also the preferred needle for Mesolift of the face and neck/cleavage region.

In the epidermal dragging technique, the needle (a BD Micro-lance 13 mm in length is best) is only dragged across the skin with a quivering, “Parkinsonian”, linear movement. The elastic oscillations of the needle are exploited when doing so. This filigree-like technique allows quick coverage of larger areas.

The network-like distribution of injections is another option. This results in a long-term effect of the active substances, e.g. in cellulite treatment or Mesolift.



Epidermal mesotherapy injection technique using an injector gun: the fine droplets are actively absorbed by the skin and disappear within minutes.



5

Manual epidermal technique: the needle is stroked across the skin with very little downward pressure. An even pressure on the plunger applies the liquid uniformly, drop by drop.



The welt represents a superficial skin depot. Active substance transport away from the welt takes place slowly by diffusion.

## The consultation

### 6.1 History, inspection, palpation, marking the skin

When taking the patient's history, it is very important not only to include the usual medical history, but also the patient's particular esthetic history. Unfortunately, any previous treatments are often not documented in a cosmetic record, so that they must be actively elicited from the patient and recorded in writing. Duplication can be avoided if certain diagnostic procedures or laboratory tests have already taken place. Particular importance must be placed on determining if the patient is pregnant, on allergies or drug intolerances, and on any medicines or food supplements the patient may be taking. Thus, for example, aspirin or enzyme products can considerably increase an individual's predisposition to hemorrhages. Oral anticoagulant therapy is not necessarily an obstacle to mesotherapy, but the treatments should be limited to superficial techniques. An adverse family history, autoimmune disorders, HIV, hepatitis or herpes infection should also be considered in the consultation.

For body modeling treatments, it will be necessary to record height and baseline weight, as changes in weight have appreciable effects on the treatment outcome. Current BMI is a key factor in the therapeutic strategy, which should include clarification as to whether a local treatment is to be carried out alone or in combination with weight loss measures. The local treatment may help the patient achieve her desire to lose weight in her specific problem zone, rather than in the face or breasts.

$$\text{BMI} = \frac{\text{body weight}}{(\text{height in m})^2}$$

BMI 20–25	Normal weight	
BMI 25– 30	<b>Grade I: overweight</b>	Must be treated if there is high blood pressure, diabetes, osteoarthritis or an elevated cholesterol level
BMI 30–40	<b>Grade II: obesity</b>	Grade 2 and 3 must be treated (increased risk of diabetes and heart disease)
BMI more than 40	<b>Grade III: severe obesity</b>	

When inspecting and examining the patient, just as much attention should be paid to facial expression and body posture as to overall visual impression. The state and consistency of the skin, connective and adipose tissue and hair must be ascertained. This is followed by an assessment of skin type, perfusion status and any pathological changes. In some cases, there may be some prior damage, e.g. as a result of previously used permanent fillers. Dysmorphophobia (dysmorphic body disorder) may be present in a small percentage of cases, and the physician should be familiar with this syndrome. It is a false, psychopathological perception of one's own body. An esthetically successful treatment comprises all the aspects discussed above, and the better the patient selection process, the choice and the combination of the required measures, the more convincing the eventual treatment outcome will be.

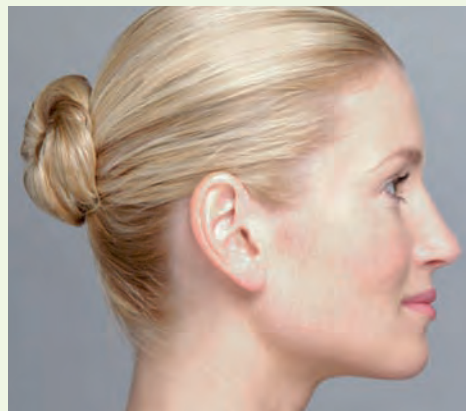
#### 6.1.1 Observation criteria

##### Face, frontal view

- Face shape and asymmetries
- Facial contours and fat distribution
- Assessment of structural and facial expression lines
- Skin quality, skin color
- Hairline and hair structure
- Is treatment of the neck and/or cleavage also necessary?
- Degree of elastosis
- Assessment of the hairline and hair structure.

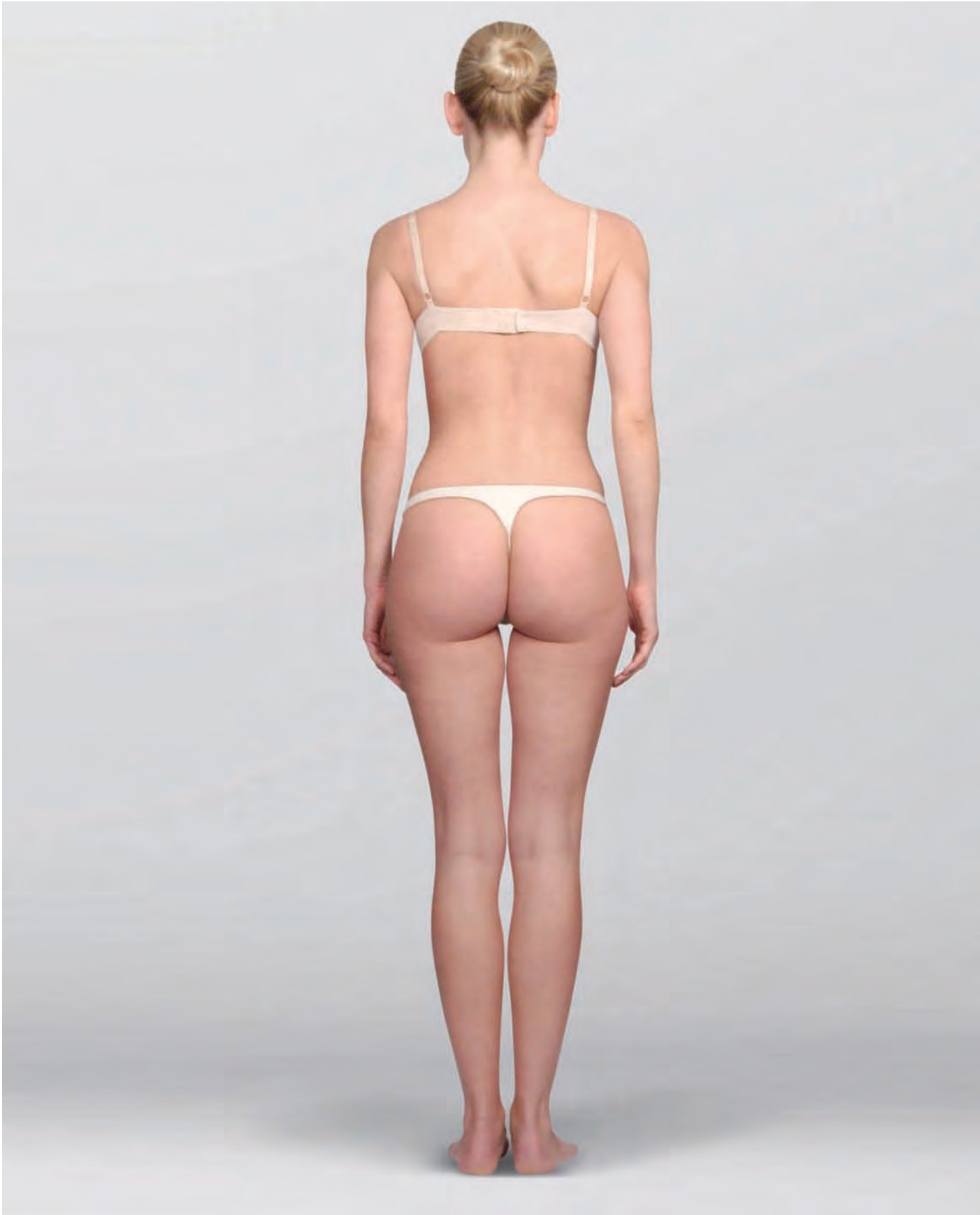
##### Face, side view, profile

- Assessment of the profile
- Structural and facial expression lines
- Fat distribution
- Contours, particularly the transition between chin and neck (double chin, sagging?).



The blurred contours of the mandibular line and the transition between chin and neck only show up in profile.





In the whole-body inspection, the zones to be treated are determined (with the patient standing) and the skin then marked (with the patient lying down) for the subsequent treatment.



In Mesobotox, a combined technique is used to achieve both relaxation of the small superficial skin muscles ...



... and a diffuse and thus discrete effect on the deeper musculature.

## 8.2 MesoHair

Thick, luxuriant hair is a sign of youthful dynamism. A full head of hair communicates a positive impression to our fellow humans. Consequently, both men and women suffer greatly from another typical sign of aging: hair loss.

The daily loss of up to 100 individual hairs is normal. During washing, the only hairs that are lost are those already in the resting phase, that would have fallen out in any case. The most common type of hair loss in men, so-called androgenetic alopecia, has a genetic cause. It develops due to an inherited hypersensitivity of the hair roots to dihydrotestosterone (DHT), formed in the body from the male hormone testosterone. It is typical to see either a *receding hairline* at the front, or thinning of the hair at the back of the head in a *tonsure* pattern.

A certain degree of androgen-related hair loss is also normal in women over 50, particularly in the parietal region, caused by the hormonal changes during the menopause. This also includes a loss of hair volume due to a progressive decrease in hair thickness. However, this type of hair loss is also increasingly found in younger women, for unknown reasons. A periodic increase in hair loss may occur in spring and autumn. This rise in hair turnover is a normal, self-regulating physiological process. Post-partum alopecia, this time caused by hormonal changes following childbirth, is another form of physiological hair loss.

Acute hair loss can be experienced as totally traumatic from the psychological point of view, and rapid and effective intervention is often needed. When the history is taken, the patient will need to be asked about the duration and severity of the hair loss, previous treatments and any medication (taken orally, including food supplements; ask about DHEA and topical treatment, e.g. with minoxidil), exposure to toxins (thallium, arsenic, mercury, chemotherapy), concurrent disorders, e.g. of the thyroid, or iron deficiency (lab tests will be needed).

Mesotherapy should not be recommended in patients with high autoimmune activity, e.g. in (sub)total alopecia areata, in FFA (=frontal fibrosing alopecia with folliculitis and destruction of the hair follicles by scarring) or in patients with long-standing baldness, because of the poor chances of success. If definitive destruction of the hair follicles has taken place, the only remaining option is the *classical* method of autologous hair transplantation, in which so-called micrografts (individual hair follicles or small groups of two to three hairs) are transplanted. However, in all other forms of non-pathological hair loss, there is a very good chance of achieving successful and safe treatment with MesoHair. Prompt intervention is ideal, to prevent atrophy of the hair follicles and excessive apoptosis of the keratinocytes. The aim is to increase the anagen and reduce the telogen phase. This can be demonstrated using a trichogram (see Figure,

page 89). The Trichoscan® is another diagnostic method. Most patients refuse a traction test or a skin biopsy. In contrast, photographic documentation of the treatment course, which is also shown to the patient, is desirable and considerably increases compliance.

### 8.2.1 The hair phases

#### 1 Anagen phase

Duration c. three to seven years, active pigment production, growth c. 1 cm/month, > 80% of all hair on the head.

#### 2 Catagen phase

Duration two to four weeks. The hair shaft detaches itself from its blood supply, hair color is lost; two to three percent of hairs are in this phase at any point in time.

#### 3 Telogen phase

The most severe hair loss, up to 15% of hairs are in this phase. It can last three months.

The revitalization cocktail injected into the scalp in MesoHair leads to stimulation and regeneration of the hair roots. Hair loss of any sort is arrested in most cases. Provided that the hair roots are still vital, it results in renewed and often continuing hair growth, together with improved hair quality. Six sessions at one-week intervals will be needed. This is followed by three treatments every two weeks with subsequent monthly maintenance treatments, if required.

Hair growth in unwanted places or shedding (increased hair loss caused when the telogen hair falls out) is not generally likely. New hair becomes apparent after about two to three months. Patients should wash their hair before the treatment and must not dye their hair or have a perm for the first 24 hours. Incidentally, the scalp is not particularly sensitive to pain, although stimulation of the many acupuncture points is often perceived as unpleasant.

Any other problems, such as dandruff or seborrhea, can also be treated during the MesoHair therapy. In these cases, a homeopathic adjuvant is added to the mesotherapy mixture, in the form of Ferrum Sulfur comp. from Wala or Wiedemann Homöokomplex BH. Contrary to public opinion, the scalp is very well perfused, which is why the antifibrotic agent pentoxifylline tends to be used as a vasoactive agent.

Buflomedil can lead to severe hyperemia of the scalp even at doses of just over 0.2 ml. The purpose of the active substances used in MesoHair is to energize the keratinocytes in the matrix, i.e. to improve the terminal microcirculation, thus improving micronutrition of the hair follicle.



The hair loss treatment may be administered manually or using the mesotherapy injector. Needle length 4–6 mm (Mesojet is best).



Treatment zones and injection technique in frontal hair loss. Tonsure pattern or circular hair loss (alopecia areata) is treated analogously.



Treatment zones and injection technique in hair loss in the parietal region. Epidermal lines are an option only in cases of severe thinning or where a bald spot has formed.

### 8.3.5 Injection methods

After surgical intervention (liposuction, lipo-aspiration), mesotherapy is the most effective medical cellulite treatment method for local accumulations of fat and disruptions in adipose tissue structure. In most cases, repeated treatments lead to targeted reduction in the problem area. Xeroradiography and MRI scans show a marked reduction in adipocyte size and a finer cell structure. If thicker fat stores are present in addition to the superficial cellulite, the most effective method is a combination with so-called injection lipolysis. With these methods, care is needed with the various drug mixtures, injection techniques and depths. The total amount used depends on the extent of the changes. Systemic effects due to absorption are likely if more than 20 ml is used. The treatment is administered directly into the area showing the changes. The active substance quantities depend on the extent of the changes and on the individual constitution of the patient.

## 8.4 Mesotherapy in cellulite

### Examples of drug mixtures

*Mesotherapy, superficial administration 1–6 mm, mixed technique*

M1: Procaine 1% 2 ml + L-carnitine 2 ml + caffeine 10% 2 ml + Buflomedil 2 ml + BH 2 ml

M2: NaCl 2 ml + PPC/DC 2 ml + Asiacen 2 ml + pentoxifylline 2 ml + Cynomax 2 ml

M3: Procaine 1% 2 ml + PPC/DC 2 ml + Buflomedil 2 ml + Silicor 2 ml + Rutinel 2 ml

**Ready-made products:** Cocktail anticellulite (large areas) + Cocktail anticellulite spot (node infiltrations) from Toskani, 5 ml each + vasoactive agent 1 ml + LA 1 ml.

**Injection technique M1–3:** serial injections and nap-page, depth 2 mm (face) – 6 mm (body), treatment interval at least 2 weeks.

## 8.5 Lipolysis for local fat pads

*Lipolysis syringe, subcutaneous infiltrations, depth 4–6 mm (face), 6–15 mm (body)*

Lipolysis injections are in particular demand for small fat pads, e.g. on the abdomen, legs (saddle bags), knees, upper arms, hips, and for small lipomas. This method is also an esthetic aid for the face (nasolabial fat, double chin, hamster cheeks, “moon face”, bags under the eyes).

The lipolysis syringe is suitable for penetrating and dissolving small fat deposits. The active substance combination contains Lipostabil N, which is introduced into the affected regions with fine needles, allowing it to exert the desired effect. The result becomes fully apparent after a few weeks. To achieve optimum results, these injections are repeated some three times at intervals of six to ten weeks. A reduction in the thickness of the fat layers of about 1 cm may be expected per session. The treatment costs and risks of injection lipolysis are a great deal lower compared to surgical liposuction.

The patient needs to be informed extensively and in detail about the universal side-effects: pain and itching, swellings, reddening and hematomas are caused by the active substances and are simply part of the process, even with the best injection technique. The main symptoms subside gradually after three days, while the main effect sets in after the fourth week. The patient must not take part in any sports/physical activity on the day of the therapy and should drink plenty of water or, even better, apple spritzer, to avoid circulatory reactions or dehydration. Vegetable stock or bitter preparations (artichoke, chicory, Bitterstern® drops, Urbitter® Bio Granulate) are recommended and can help boost any additional weight loss that may be desired. A heparin gel or Retterspitz® compresses are recommended for local cooling and against the hematomas.

The active substances are distributed across and into the depth of the subcutaneous tissue by diffusion; they may be either metabolized in situ or transported away by the blood. They leave the body naturally together with the mobilized fat.

Experience has shown that the best results are achieved with special needles (Thiebaud 6 mm with 5-sided bevel or BD Hypoint 0.4 x 13 mm). This ensures that the multiple injections cause little pain and that the formation of hematomas is minimized.

The frequency of the sessions is one every 6 weeks (in winter is best), with a total of 3–10 sessions depending on severity and extent. This is not a treatment for systemic obesity, but for localized fat deposits with and without connective tissue weakness. The greatest advantage of lipolysis lies in the additional firming effect on the skin. The patient needs to be warned that there is a long waiting time of at least 6 weeks before a visible result is achieved. This waiting time may last up to 3 months for those notorious fat pads around the eyes.

If venous and lymphatic insufficiency is also present, then concomitant classical mesotherapy for drainage and toning of the veins is also recommended. The same applies to the commonly seen “stress factor”, which can be treated with the mesotherapeutic anti-stress protocol.



Materials required for lipolysis.



Mixing the two components for lipolysis (aqueous phase 5 ml + PPC/DC 5 ml).



The cocktail is ready to use once the appropriate needle is fitted. It should be used immediately after preparation.

# Illustrated Atlas of Esthetic Mesotherapy

Mesotherapy is a simple and effective treatment method. It involves the targeted administration of active medicinal substances into the skin and connective tissue in the form of microinjections. The method was developed more than 50 years ago by Michel Pistor in France, where it is regarded as an established procedure.

**The author** Dr. Britta Knoll MD is President of the German Mesotherapy Association. More than 25 years ago, as part of her medical training in Paris, she was taught mesotherapy by its founder Michel Pistor. Since then, she has devoted herself to the research, application and teaching of this effective form of treatment.

**The editor** Dr. Gerhard Sattler is President of the GÄCD, the Association for Esthetic Surgery in Germany and Executive Director of the International Society for Dermatologic Surgery. He also belongs to various other professional associations and is Director of the Rosenpark Clinic in Darmstadt. He has recently published the Illustrated Atlas of Esthetic Botulinum Toxin Therapy at KVM Publishing (a Quintessence Publishing Company).

## Expert practical knowledge

This Atlas provides a step-by-step introduction to the practice of mesotherapy, with the help of 165 color illustrations. Topics including skin rejuvenation (Mesolift), treatment of hair loss (Mesohair) and the treatment of local fat pads and cellulite are demonstrated in detail. The basics section of the book describes the active substances, legal issues, materials and techniques, while the practical section goes into regional methods, pre- and post-treatments and combined therapy options. Photographic case histories confirm the authentic benefits and efficacy of mesotherapy.



## Plus points

- **Outstanding illustrations:** Extensive photo documentation sequences visually communicate the systematic aspects of mesotherapy.
- **Unique didactic presentation:** Photographic series and treatment regimens provide a step-by-step guide to the practical aspects of the treatment.
- **Practical aids:** Working aids and information materials (some in the form of templates for copying) that can be used not only for documentation, but also for patient information and consent purposes.

**Britta Knoll**

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