# Content

### 3.3.1 Musculature

The superficial facial muscles radiate into the skin. It is difficult to differentiate between the individual muscles by palpation. However, palpation does make it possible to differentiate between increased or reduced muscle tone. The objective assessment of muscular activity is an important point in preoperative examination in order to chose an adequate dosage for the botulinum toxin injections (cf. Chapter 3.4, p. 25 f.).

### 3.3.2 Bones

The bony prominences palpable on the face, such as the upper and lateral orbital margin, the cheekbone, the mandible and the tip of the chin, provide an anatomical guide for the planned injections.

## 3.4 Functional testing

Besides the wrinkle severity evaluated during inspection, a functional testing of the involved mimic muscle is crucial for proper planning of treatment. Botulinum toxin A injections will lead to a dose-dependent attenuation of the muscle tone.

This is why the present state of muscular dynamics is determinant for an appropriate dose selection achieving natural wrinkle smoothing. Correct adjustment of toxin doses will prevent from overcorrection as well as from an undesired absence of the treatment outome.

A good way to assess the muscular activity involved in wrinkle formation is by palpating the patient's mimic areas in action. This is best done while asking him or her to perform various facial movements – e.g. raising the brows, frowning, closing the eyes tightly, wrinkling the nose or turning down the mouth. The Target of each investigation is the maximal muscular tension that the patient is able to produce while carrying out the facial action. To visualize examples for possible palpable findings, the authors decided to describe the muscle tones by the aid of amplitudes having peaks on a scale of 0–1.

From a clinical perspective, one can distinguish between three levels of activity: the first distinction that is made is between individuals with **hypokinetic** and **hyperkinetic movement types**. The former are characterized by less pronounced facial expressions. In contrast, those with hyperkinetic movements show active facial expressions and sometimes even exaggerated facial expressions.

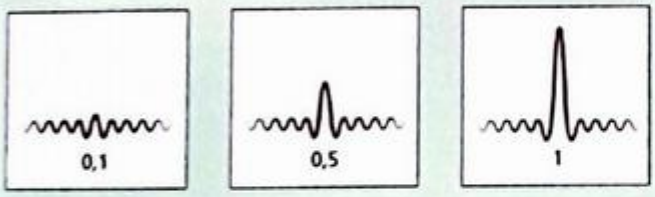
The clinical relevance of this is that people with highly active, i.e. hyperkinetic muscle tone often need considerably higher doses. The dosing recommendations include a so-called correction factor to take account of this. In the end, this will come down to the therapist's instinct and experience with the treatment.

A further type, the **hypertonic type**, also needs to be included here from the clinical viewpoint. In this type, the muscles are constantly in a state of heightened tone, even though the individual in question is not aware of this. Repeated treatments at shorter intervals may be needed where this is the case. The patient should be told about this beforehand, to counter any unrealistic expectations of duration from the treatment.

As a general rule, the amount of muscular dynamic correlates with the age and gender of the patient. Men normally express more dynamic mimic activities than women, particularly with increasing age. The dose recommendations given in this manual mainly refer to women with intact moderate-toned muscle activities (~0.5). Depending on the patient's age and gender and, above all, depending on the individual findings after the functional testing, the practitioner has to consider possible dosage corrections.

**Video: "Examination and functional testing"**
http://www.kvm-tv.de/BTX/btx001.mp4

**Illustration of mucle tones**

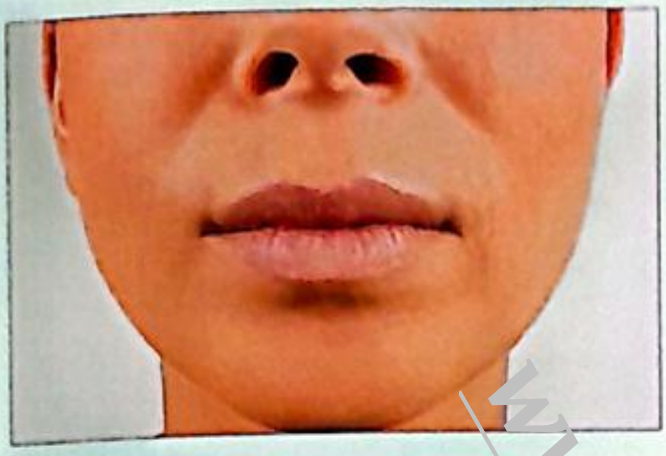


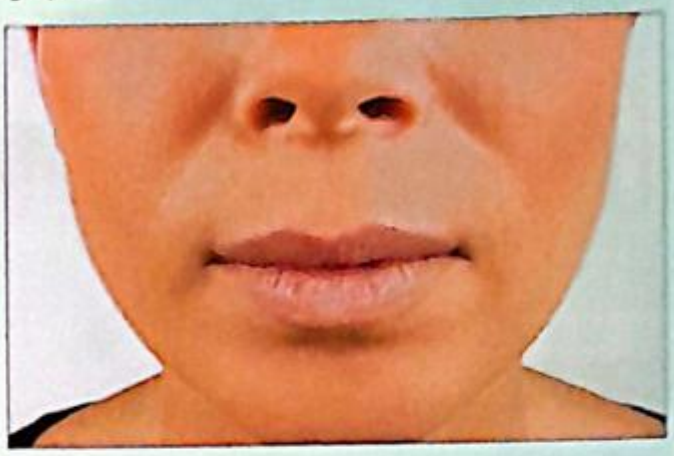

The illustrated amplitudes are representing muscular activities. Each peek shows the maximal amount of muscular tension that the patient is able to produce in conscious contraction of the mimic area. Patients with lower muscular activity (left) have to be treated with lower doses of botulinum toxin than people demonstrating enhanced muscular dynamic (right). The median amplitude represents moderate muscular dynamics commonly occuring in younger female patients.

Patients whose skin elasticity is preserved and whose facial expressions are active and dynamic, are typically the ones who benefit most from a course of treatment with botulinum toxin A. Patients with age-related loss of skin elasticity or those with skin changes due to intense and chronic exposure to the sun will usually have less impressive results. (Cf. fig. p. 26)

An objective evaluation of the muscular tensions involved in the formation of facial lines is elementary for an appropriate dosis selection in wrinkle therapy with botulinum toxin A. A patient with extraordinarily active mimic muscles has to be treated with higher substance doses to achieve the intended weakening. Hypokinetic patients with less pronounced facial expressions require lower doses, as overdosing can cause undesired rigidity.

## Maintaining the correct distance from the area being photographed



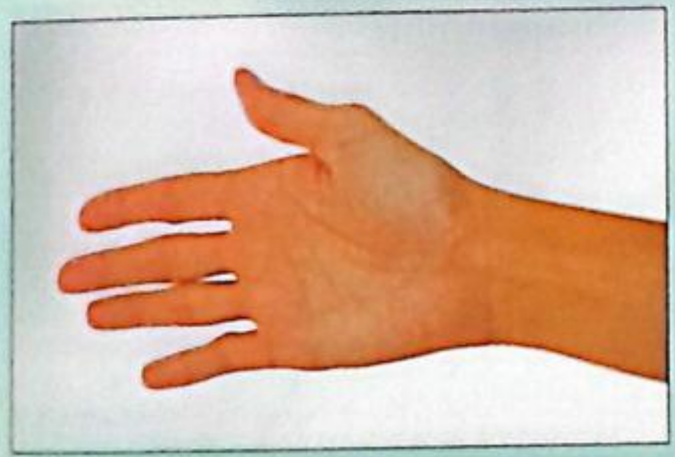


Distortions caused by moving the camera too close to the shot area

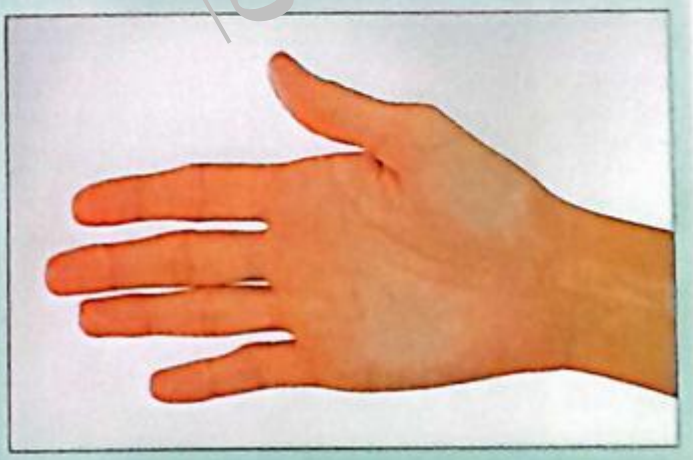
Better: shot taken by zooming in from a distance (100 mm focal length)



## Correct camera angle



"Tipping" the camera causes some areas to be out of focus.



Ensuring that the camera is parallel to the imaging plane delivers sharply focused images.