

## The facial rejuvenation algorithm

Zoe Diana Draelos, MD

*Editor in Chief, Journal of Cosmetic Dermatology*

The cosmetic dermatology approach to facial rejuvenation incorporates both medical and surgical approaches. Medical considerations include the use of pharmaceuticals, nutraceuticals, and cosmeceuticals in combination with surgery designed to resurface, redistribute, and reshape. While the scientific cause of aging is the shortening of the telomere following numerous cell divisions, the dermatology patient characterizes aging as the appearance of wrinkles. Yet wrinkles are eliminated or minimized through corrections to the eroding bony architecture, decreased cartilaginous support, redistributed subcutaneous fat, thinning dermal collagen, decreased epidermal turnover, and the failure of exfoliation to occur in the stratum corneum. Only by considering each of these age-related changes can facial rejuvenation optimally occur.

Discrete rounded features formed by the structure of the underlying facial bone characterize a universally beautiful face. Bone demineralization begins around age 25 in females and increases throughout life with less bony support creating the appearance of wrinkled excess facial skin. Dermatologists should master the art of bone loss prevention through the use of estrogen hormone replacement, biphosphonates, and vitamin D and calcium carbonate supplements. There is no logic to implanting expensive fillers to expand deep folds of the face without preserving the underlying bone from facial osteoporosis.

Once the issues of bone loss have been addressed, then the subcutaneous compartment requires attention. There is no explanation for the observation that fat redistribution with age leads to loss of subcutaneous fat, especially on the face, and increased deposition intra-abdominally. Autologous fat transfer with fat placement on the bone, within the muscle, and beneath the skin can lead to a long-lasting improvement in facial contour, restoring the

gentle curves associated with youth and eliminating the facial angularity seen with advancing age.

Once the bone and subcutaneous fat compartments have been considered, the draping of the skin over this framework is the next focus. Fillers, deep chemical peeling, and ablative laser resurfacing can be used to replace or encourage regeneration of lost dermal collagen. Botulinum toxin can be used to minimize the effect of hyperkinetic facial muscles on the thinning skin. Medium depth chemical peeling and intense pulsed light can be used to improve pigmentation. Generally, a combination of techniques is required to achieve the best result.

Lastly, attention should be paid to the epidermis and the stratum corneum. Microdermabrasion and superficial glycolic or salicylic acid chemical peels can be used to enhance exfoliation while 5-fluorouracil or diclofenac can be used to remove damaged epidermal cells forming actinic keratoses. The appearance of the stratum corneum may also benefit from the use of a moisturizer containing emollients to smooth the skin surface and sunscreens to prevent further photodamage.

Thus, the dermatologic approach to facial rejuvenation crosses many disciplines. We must be skilled at using pharmaceutical preparations, such as tretinoin, 5-fluorouracil, diclofenac, etc. to rejuvenate ill-behaved aging cells. We must be skilled at recommending the use of nutraceuticals, such as oral antioxidants, vitamin D, calcium, etc., to provide the necessary raw materials for the skin and underlying bone to form properly. Lastly, we must understand the world of topical cosmeceuticals, to include moisturizers and sunscreens, such that the skin surface can be protected from damaging UV radiation and the effects of the external environment. Cosmetic dermatology combines pharmaceutical, nutraceutical, and cosmeceutic modalities to achieve state-of-the-art facial rejuvenation.

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Correspondence: Zoe Diana Draelos, MD, 2444 North Main Street, High Point, NC 27726. E-mail: [zdraelos@northstate.net](mailto:zdraelos@northstate.net)

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