

# Treating the Young Aesthetic Patient: Evidence-Based Recommendations

Lauren Meshkov Bonati MD<sup>a</sup> and Sabrina Guillen Fabi MD<sup>b</sup>

<sup>a</sup>Icahn School of Medicine at Mount Sinai, New York, NY

<sup>b</sup>Cosmetic Laser Dermatology, San Diego, CA

## ABSTRACT

**Background:** There is growing demand for cosmetic treatments in the younger population, yet counseling and treating this age group can be difficult to justify.

**Objective:** Chronologic changes that cause noticeable signs of aging are discussed within each age group. Age-appropriate cosmetic preventions and interventions are therefore recommended.

**Methods:** A PubMed search was performed for high quality trials and evidence based reviews on the basic science of aging, as well as on cosmetic modalities and their histological, biochemical, and clinical effects.

**Results and Conclusion:** Specific age-related changes occur with each decade of life. A complete understanding of when these physiologic changes occur helps determine age-appropriate cosmetic counseling, preventions, and interventions.

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## INTRODUCTION

Recent speculation has indicated that it is rarely too early to begin aesthetic treatments.<sup>1</sup> The growing demand for anti-aging in younger populations requires thoughtful and age-appropriate counseling for delivering preventions and interventions. The physiologic, age-related changes that occur with each decade of life may serve as a blueprint for when to start cosmetic treatments.

### Under 20

#### *Photoprotection*

Photodamage begins with childhood exposure to Ultraviolet radiation (UVR). Between the 1st and 9th decade of life, staining for type I and type III collagen has been shown to reduce from 82.5% and 80.4% to 53.2% and 44.1%, respectively, in sun-exposed skin when compared to photoprotected skin ( $P=0.0004$  and  $P=0.0008$ ).<sup>2</sup> Daily UV filters that contain zinc oxide and titanium dioxide are less irritating and recommended for anyone over 6 months old.

#### *Alpha-Hydroxy Acids*

Alpha-hydroxy acid (AHA) cleansers reduce photodamage, wrinkling, roughness, dyschromia, and additionally improve acne that may affect this age group. After months of daily use, histologic benefits include a thickened epidermis, increased papillary mucopolysaccharides, improved elastic fiber quality, and increased collagen density.<sup>3</sup>

#### *Retinoids*

Topical retinoids are a mainstay of anti-aging and a first-line treatment for those with acne. Multiple studies have demonstrated

the beneficial effects of tretinoin on overall appearance, surface roughness, fine and coarse wrinkling, mottled pigmentation, uneven skin tone, and sallowness. Histologically, tretinoin has been shown to increase anchoring fibrils and collagen in the papillary dermis, and to normalize overall structure.<sup>4</sup>

### During the 20s

Daily exposure to UVR, smoking, and pollution causes cumulative damage that results in dyschromia, loss of collagen, reduced elastic recoil, and premature aging. Collagen decline beginning in the 20s reduces from 70% to 50% by age seventy.<sup>5</sup> A similar decline in bony volume starts in the mid to late 20s, resulting in poor resting tone of the mimetic musculature that originates on bone, and results in static rhytides.<sup>6</sup> A stepwise increase in rhytides has been reported by age 33,<sup>7</sup> warranting preventative treatment in younger patients with noticeable fine lines and wrinkles.

### Topicals

#### *Antioxidants*

Topical antioxidants compensate for the declining endogenous response to oxidative photodamage that begins in the 20s.<sup>8</sup> A double-blinded, split-face study of 10 patients who used a daily antioxidant blend found increased Grenz zone collagen and type I collagen mRNA when compared to vehicle control ( $P=0.01$ ).<sup>9</sup>

#### *Growth Factors*

Topical growth factors may help reduce photodamage and wrinkles. Twelve subjects who used twice daily human growth factors for 6 months reported 33% and 25% average improvement in periorbital and perioral wrinkles, respectively.<sup>10</sup> Histological

analyses showed moderate change in epidermal thickness, increased fibroblast density, and new collagen formation on electron microscopy.

## Injectables

### *Neuromodulators*

Botulinum toxin A (BoNTA) blocks acetylcholine release at the neuromuscular junction and is FDA approved for the treatment of rhytides in those over age 18. The superiority of BoNTA versus placebo has been well documented in many randomized, controlled trials with higher satisfaction and increased responder rates seen in younger populations.<sup>11</sup>

BoNTA-induced neocollagenesis improves skin pliability, elasticity, and dermal architecture, softening static lines. Resultant muscle atrophy inhibits muscles of negative expression, slowing future wrinkle development. A multi-center, retrospective study of 207 BoNTA patients followed over 9.1 years reported a drop in perceived age by 6.9 years in 89.7% of patients.<sup>12</sup> Identical twin studies have corroborated the cumulative and preventative effects of BoNTA over a 19-year period.<sup>13</sup>

## Lasers and Light

### *Intense Pulsed Light*

Photodamage, dyschromia, telangiectasias, freckling, and acne in this age group may be treated with intense pulsed light (IPL). Neocollagenesis and elastic fiber proliferation are known benefits, with conversion to a younger pattern of RNA expression after 3 treatments.<sup>14</sup>

### *Lasers*

Acne scars in any age group are effectively treated with resurfacing lasers that offer additional anti-aging benefit. Fractional photothermolysis via ablative (AFL) and nonablative (NAFL) devices are effective alone or in combination for the treatment of rhytides.<sup>15</sup>

## Body Contouring

### *Cryolipolysis*

Cryolipolysis triggers adipocyte apoptosis and is FDA approved in patients over 18 with unwanted fat in the abdominal, flank, thigh, and submental regions. Average fat reduction has been reported between 10.3-25.5%<sup>16</sup> with the additional benefit of improved skin texture, laxity, and cellulite. Younger patients are more likely to have localized fat bulges in the setting of normal body weight, which makes them ideal candidates.

### *High Intensity Focused Ultrasound*

High Intensity Focused Ultrasound (HIFU) ablates subcutaneous adipose tissue and is FDA approved for the waistline. A 2.0 cm reduction in waist circumference was reported in a multi-center, randomized, sham-controlled, single-blinded trial of 180 patients after one HIFU treatment.<sup>17</sup>

### *Deoxycholic Acid*

Submental fullness may occur in all age groups and can be treated with Deoxycholic acid injection, an FDA approved method that triggers adipocyte lysis and cell membrane disruption. In two multi-center, randomized, controlled, double-blinded trials of over 500 patients who received up to 6 deoxycholic acid treatments, 70.0% and 66.5% of subjects saw a 1-grade improvement on the submental fullness score when rated by clinician and subject, respectively ( $P<0.001$ ).<sup>18</sup> An 8-fold improvement was seen on magnetic resonance imaging (MRI) when compared to placebo ( $P<0.001$ ).

### *Cellulite Devices*

Cellulite at any age may be treated by destroying fibrous septae that bind down herniating adipose tissue. A multi-center study of 55 women who underwent 1 treatment with the FDA-approved vacuum-assisted controlled tissue release system, saw 93% improvement of buttock and thigh cellulite in 47 subjects ( $P<0.001$ ).<sup>19</sup> There was 96% improvement after 1 year, 98% after 2 years, and 94% satisfaction rate. Another study of 15 females with thigh and buttock cellulite who underwent Nd:YAG 1,440-nm laser treatment, reported improved contour in 66% of patients and reduced dimple depth by 49% at 6 months.<sup>20</sup>

## 30s and 40s

Signs of aging worsen with accumulated photodamage, continued collagen decline, and significant bony loss in the 30s and 40s, making dyschromia, laxity, rhytides, and accentuated skin folds of particular concern.

## Topicals

### *Hydroquinone*

Dyschromia and mottled hyperpigmentation may be treated with topical hydroquinone (HQ) or a HQ-free formulation used nightly after a topical retinoid. After 12 weeks of HQ or HQ-free lightener, a study of 36 females reported significantly reduced scores on the Mottled Pigmentation Area and Severity Index and improved sallowness.<sup>21</sup>

## Injectables

### *Fillers*

Injectable fillers restore youthful contour and reposition ligaments and vectors when bony volume loss and facial fat pad descent begins in the mid-30s. A 10-degree reduction in the maxillary angle between age 30 and 60 further results in mid-cheek volume loss, sunken hollows, and poor bony projection that may be compensated with soft tissue fillers.<sup>22</sup> Hyaluronic acid (HA) injection was shown to decrease perceived age in 10 patients by 6.1-7.3 years and 7.8-9 years as judged by dermatologists and subjects, respectively.<sup>23</sup>

Injectable fillers are known to stimulate neocollagenesis, resulting in less frequency of treatments needed over time. Persistent

volume was seen in 63 patients at 21.6 months post-HA injection and 2.5 years after calcium hydroxylapatite injection.<sup>24,25</sup> Poly-L-Lactic acid stimulates long-term neocollagenesis beginning 3-6 months post treatment and lasting up to 2 years or more.

## Energy Devices

### Lasers

Skin laxity in this age group may be treated with various fractionated and non-fractionated, ablative and nonablative laser types. Although ablative lasers are known to be most efficacious,<sup>26</sup> laser choice depends on patient budget and tolerance of downtime.

### Microfocused Ultrasound

Skin laxity on the face, neck, chest, and arms may be treated with microfocused ultrasound (MFU), which causes thermal coagulation and neocollagenesis. In a retrospective study of 45 patients, face and neck laxity improved after MFU treatment in 75% and 77.8% of subjects, respectively, at 90 and 180-day follow-up, as per subject reporting.<sup>27</sup>

### Radiofrequency

Monopolar radiofrequency (MRF) causes thermal damage via high-frequency electric current and stimulates neocollagenesis. It is FDA approved for body laxity, facial lines, and cellulite. Upper eyelid tightening and reduced hooding was seen in 88% and 86% of patients, respectively, in a study of 63 subjects who underwent MRF treatment.<sup>28</sup>

## CONCLUSION

The aging process is chronologically predictable, with outward manifestations beginning in the late 20's and progressing with each decade. Appropriate cosmetic counseling, preventions, and interventions for younger populations are justified based on standard physiologic aging and individual concerns.

## DISCLOSURES

Sabrina Guillen Fabi is an Investigator, Consultant, and Advisor for Galderma, Valeant, Allergan, and Merz. Dr Fabi serves on the Speakers bureau for Galderma, Allergan, Merz, Lumenis, and Coolsculpting. Lauren Meshkov Bonati has no conflicts of interest to declare.

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## AUTHOR CORRESPONDENCE

### Lauren Meshkov Bonati MD

E-mail:..... lauren.bonati@gmail.com