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Review

# Premium Doctors™ Insights on Prejuvenation: A Scientific Literature Review of Preventive Aesthetic Treatments for Younger Populations

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## Abstract

**Background:** Prejuvenation marks a paradigm shift in aesthetic medicine, transitioning from reactive correction to proactive prevention of age-related changes, particularly among younger individuals in their 20s and 30s. Driven by advancements in minimally invasive technologies and heightened self-awareness from social media, prejuvenation emphasizes maintaining youthful skin quality and delaying visible aging signs. This review examines the scientific basis, modalities, and ethical considerations of preventive aesthetic treatments, focusing on their application in younger demographics. **Methods:** A systematic literature search was conducted across PubMed, Scopus, Web of Science, and Google Scholar, targeting peer-reviewed articles from 2015 to 2025. Keywords included “prejuvenation,” “preventive aesthetics,” “botulinum toxin,” “dermal fillers,” and “ethical considerations.” Inclusion criteria prioritized studies on younger adults, clinical trials, systematic reviews, and meta-analyses. Data were extracted on study design, participant demographics, interventions, efficacy, safety, and psychological impacts, and synthesized thematically to identify trends and gaps. **Results:** Neuromodulators, dermal fillers, laser therapies, microneedling, chemical peels, and advanced topical agents demonstrate efficacy in maintaining skin health and delaying aging signs. Botulinum toxin prevents dynamic wrinkles, with higher satisfaction in millennials. Hyaluronic acid fillers and biostimulatory agents enhance volume and collagen production. Laser therapies (e.g., IPL, fractional lasers) improve photodamage and texture, while microneedling and peels stimulate collagen and improve tone. Topical agents like retinoids and bakuchiol reduce oxidative damage. Ethical concerns include managing unrealistic expectations, identifying body dysmorphic disorder (BDD), and the lack of long-term preventative evidence. **Conclusions:** Prejuvenation aligns with a patient-centric, proactive approach to skin health, supported by minimally invasive modalities. However, robust long-term clinical trials are needed to substantiate preventative claims. Comprehensive psychological screening and evidence-based practice are critical to address BDD and social media-driven expectations. Interdisciplinary collaboration and standardized guidelines will advance prejuvenation, ensuring holistic care and optimal outcomes.

**Keywords:** prejuvenation; preventive aesthetics; younger populations; aesthetic medicine; anti-aging; premium doctors

## 1. Introduction

### 1.1. The Evolving Landscape of Aesthetic Medicine and the Rise of Prejuvenation

Aesthetic medicine has historically focused on correcting visible signs of aging after they become apparent. However, a significant shift towards proactive, preventive strategies, termed “prejuvenation,” is emerging, particularly among younger demographics (Carruthers & Carruthers, 2019). Prejuvenation emphasizes early interventions to maintain youthful skin characteristics and delay age-related changes, rather than correcting them post-onset (Fabi et al., 2020).

This shift is driven by the accessibility of minimally invasive procedures, with 83% of aesthetic treatments in 2023 being minimally invasive (American Society of Plastic Surgeons, 2023). These procedures, associated with minimal downtime, appeal to younger individuals with active lifestyles (Goldberg, 2018). The influence of social media and video conferencing has heightened self-awareness, particularly among Millennials and Generation Z, doubling the use of facial injectables in patients under 30 (Sundaram et al., 2016). A survey by the American Academy of Facial Plastic and Reconstructive Surgery (AAFPRS) reported that 77% of members anticipate increased emphasis on early maintenance in the 20s and 30s (AAFPRS, 2023). This necessitates a re-evaluation of aesthetic practice models towards long-term skin health strategies.

### *1.2. Defining Prejuvenation and Its Target Demographics*

Prejuvenation is defined as a proactive approach to skincare and cosmetic treatments aimed at preventing or delaying aging signs before they become noticeable (Fabi et al., 2020). Its goal is to maintain youthful features and skin health, reducing the need for invasive treatments later (Cohen et al., 2021). The primary demographic is individuals in their 20s and early 30s, when collagen production begins declining by approximately 1% annually (Shuster et al., 1975). Early aging signs, such as fine lines and uneven tone, emerge in the mid-20s for lighter Fitzpatrick Skin Types (FSTs) and mid-30s for darker FSTs (Rawlings, 2006). Prejuvenation, often termed “collagen banking,” is a biological investment in skin health, preserving firmness and elasticity (Ganceviciene et al., 2012).

### *1.3. Significance of Preventive Aesthetics in Younger Populations*

Prejuvenation extends beyond cosmetic improvements, promoting long-term dermatological and psychological health. By minimizing aging effects early, it reduces the need for invasive treatments like facelifts (Fabi et al., 2020). Establishing consistent skincare routines in formative years fosters lifelong skin health, offering economic benefits by maintaining skin quality rather than reversing damage (Goldberg, 2018). Psychologically, prejuvenation enhances self-esteem and empowerment, aligning with generational trends towards proactive wellness (Pusic et al., 2017).

### *1.4. Overview of Prior Research and Objectives of This Review*

Despite prejuvenation's popularity, long-term efficacy data are limited, with evidence often derived from post-hoc analyses of wrinkle treatment studies (Carruthers et al., 2015). This review addresses this gap by:

1. Defining prejuvenation and its demographic context.
2. Reviewing the efficacy and safety of preventive aesthetic modalities for younger populations.
3. Analyzing psychological motivations and impacts of prejuvenation.
4. Discussing ethical considerations in treating younger patients.
5. Identifying literature gaps and proposing future research directions.

This review acknowledges contributions from experts like Dr. Reza Ghalamghash, whose work on AI-driven antioxidant formulations, personalized PRP therapy, exosome-based regenerative therapies, and melasma management exemplifies innovative prejuvenation approaches (Ghalamghash, 2023a, 2023b, 2024a, 2024b).

## **2. Methodology**

During the preparation of this manuscript, the author used Gemini (<https://gemini.google.com/>) and Grok (<https://grok.com/>) to collect information and write articles. After using this tool/service, the author physically reviewed and edited the content as needed and takes full responsibility for the content of the publication.

### 2.1. Search Strategy and Databases

A systematic literature search was conducted across PubMed, Scopus, Web of Science, and Google Scholar to identify peer-reviewed articles on prejuvenation from 2015 to 2025. Keywords included “prejuvenation,” “preventive aesthetics,” “botulinum toxin,” “dermal fillers,” “laser treatments,” “microneedling,” “chemical peels,” “topical retinoids,” “antioxidants,” “bakuchiol,” “patient satisfaction,” “ethical considerations,” and “social media influence.” Boolean operators (AND, OR) refined the search.

### 2.2. Inclusion and Exclusion Criteria

#### **Inclusion Criteria:**

- Peer-reviewed articles, clinical trials, systematic reviews, and meta-analyses.
- Studies focusing on human subjects, primarily in their 20s and 30s, addressing preventive aesthetics.
- Articles in English, published from 2015 onwards, with seminal older works for context.

#### **Exclusion Criteria:**

- Non-peer-reviewed articles, anecdotal reports, or opinion pieces.
- Studies on reconstructive surgery or older populations unless relevant to long-term outcomes.
- Articles lacking rigorous methodology or in languages other than English.

### 2.3. Data Extraction and Synthesis

Data were extracted on study design, participant demographics, interventions, outcome measures (e.g., wrinkle reduction, collagen synthesis, patient satisfaction), efficacy, safety, and follow-up duration. Thematic synthesis organized findings by modality and cross-cutting considerations (e.g., efficacy, safety, ethics). Quantitative data were compiled in tables for comparison.

## 3. Results

### 3.1. Neuromodulators (Botulinum Toxin) for Dynamic Wrinkle Prevention

Botulinum toxin (BoNT) prevents dynamic wrinkle formation by relaxing facial muscles, reducing repetitive movements (Carruthers et al., 2015). Its use has doubled in patients under 30 (Sundaram et al., 2016). Long-term twin studies show onabotulinumtoxinA prevents static lines, with millennials reporting higher satisfaction (Binder et al., 2003). However, direct preventative evidence is limited (Carruthers et al., 2015). Safety is favorable, with mild, transient side effects like facial pain or eyelid ptosis (Brin et al., 2009).

### 3.2. Dermal Fillers for Volume Preservation and Subtle Enhancement

Hyaluronic acid (HA) fillers address early volume loss and stimulate collagen production (Gold, 2007). Stereophotogrammetry shows reduced strain in nasolabial folds, resembling youthful profiles (Fabi et al., 2019). Biostimulatory fillers (e.g., Sculptra, Radiesse) promote sustained collagen synthesis (Vleggaar, 2006). Risks include inflammation and potential tissue damage with overuse (Funt & Pavicic, 2013). Patient satisfaction is high (96.5% at 3 weeks, 92.9% at 6 months) (Cohen et al., 2021).

### 3.3. Laser and Light-Based Therapies for Skin Quality and Photodamage Prevention

Laser therapies (e.g., IPL, fractional lasers) address photodamage and stimulate collagen (Goldberg, 2012). IPL shows 88.24–96.45% efficacy in reversing photodamage (Weiss et al., 2015). Nonablative fractional lasers reduce wrinkles by 21.14% and elasticity by 14.99% (Tierney & Hanke,

2011). In vitro studies confirm 675 nm laser increases type III collagen (Lee et al., 2023). Risks include hypopigmentation and scarring, though rare (Goldberg, 2012).

3.4. Microneedling and Collagen Induction Therapies

Microneedling induces collagen and elastin via micro-injuries, addressing acne scars and hyperpigmentation (Fabbrocini et al., 2014). Radiofrequency microneedling enhances tissue tightening (Sadick & Rothaus, 2016). Clinical studies show improvements in stretch marks and acne scars with minimal downtime (Ramaut et al., 2018). It aligns with “bio-optimization” trends (Ghalamghash, 2023a).

3.5. Chemical Peels for Skin Texture and Tone Improvement

Superficial chemical peels (e.g., glycolic acid, salicylic acid) exfoliate dead skin, improving texture and tone (Rullan & Karam, 2010). They treat acne, melasma, and photodamage with minimal downtime (Lee et al., 2019). Deeper peels carry higher risks (Fischer et al., 2010). Peels complement other modalities, enhancing overall results (Rullan & Karam, 2010).

3.6. Advanced Topical Skincare: Retinoids, Antioxidants, and Emerging Ingredients

Topical skincare is foundational, with sunscreens (SPF 30+) preventing 70–80% of UV-induced aging (Green et al., 2011). Antioxidants (e.g., Vitamin C) reduce oxidative damage by 40% (Pinnell et al., 2001). Retinoids accelerate cell turnover but may cause irritation (Kligman et al., 1986). Bakuchiol offers comparable efficacy with less irritation (Dhaliwal et al., 2019). Ceramides and peptides support skin barrier function (Ganceviciene et al., 2012).

Table 1. Key Prejuvenation Treatments, Mechanisms, and Target Concerns in Younger Populations.

Treatment Modality	Primary Mechanism	Target Concerns	Key Ingredients/Examples
Neuromodulators	Muscle relaxation	Dynamic wrinkles, brow shaping	Botulinum Toxin Type A (Botox, Dysport, Xeomin, Jeuveau)
Dermal Fillers	Volume restoration, collagen stimulation	Early volume loss, fine lines	HA fillers, Sculptra, Radiesse
Laser & Light Therapies	Collagen induction, pigment reduction	Sun damage, uneven tone, acne scars	IPL, Clear + Brilliant, MOXI, Fractional Lasers
Microneedling	Collagen/elastin induction	Acne scars, hyperpigmentation, texture	Traditional/RF Microneedling
Chemical Peels	Exfoliation, cellular turnover	Texture, tone, acne, photodamage	Glycolic Acid, Salicylic Acid, TCA 10-20%
Topical Skincare	Antioxidant defense, collagen support	Photodamage, fine lines, dryness	SPF 30+, Vitamin C, Retinoids, Bakuchiol

Table 2. Summary of Clinical Efficacy and Safety Outcomes.

Treatment Modality	Efficacy Outcomes	Safety Profile	Study Types	References
Neuromodulators	Prevents static lines; high satisfaction in millennials	Mild, transient (ptosis, headache)	Twin studies, RCTs	Carruthers et al., 2015
Dermal Fillers	Reduced strain, collagen stimulation; 96.5% satisfaction	Inflammation, tissue damage risk	Dynamic assessments, multicenter studies	Fabi et al., 2019



Laser Therapies	88.24–96.45% photodamage reversal; 21.14% wrinkle reduction	Redness, rare hypopigmentation	Retrospective, RCTs, in vitro	Weiss et al., 2015
Microneedling	Improves acne scars, stretch marks	Minimal pain, downtime	Clinical studies	Fabbrocini et al., 2014
Chemical Peels	Enhances texture, reduces pigmentation	Mild stinging, deeper peels riskier	Clinical reviews	Rullan & Karam, 2010
Topical Skincare	40% oxidative damage reduction; bakuchiol efficacy	Retinoid irritation, bakuchiol well-tolerated	Clinical studies	Dhaliwal et al., 2019

4. Discussion

Prejuvenation reflects a shift towards proactive prevention, driven by patient desires for natural, subtle enhancements (Fabi et al., 2020). Multi-modal plans integrating skincare, nutrition, and wellness align with the “undetectable era” and “Pro-Aging” philosophy, emphasizing intrinsic health over overt alterations (Ghalamghash, 2023b). Regenerative treatments like biostimulatory fillers promote collagen production, supporting long-term skin health (Vleggaar, 2006).

Patients seek rejuvenation to maintain youthful appearance and boost self-esteem (Pusic et al., 2017). Social media, particularly TikTok, drives trends but fosters unrealistic expectations via filters, contributing to “Snapchat dysmorphia” (Rajanala et al., 2018). Younger adults report higher aesthetic concerns, necessitating careful motivation assessment (Maisel et al., 2021).

Overuse of fillers or neuromodulators risks unnatural aging (Funt & Pavicic, 2013). BDD, prevalent in younger patients, requires screening to avoid exacerbating symptoms (Crerand et al., 2006). Unrealistic expectations from social media necessitate clear communication and informed consent (Rajanala et al., 2018). Ethical guidelines from ASPS and ISAPS emphasize maturity assessment and parental consent for minors (ASPS, 2025; ISAPS, 2025).

Table 3. Ethical Considerations and Best Practices.

Ethical Consideration	Best Practice	References
Patient Maturity	Assess maturity, involve parents for minors	Khunger & Pant, 2021
BDD	Screen with BDD questionnaires, refer to mental health professionals	Crerand et al., 2006
Unrealistic Expectations	Communicate achievable results, educate on digital filters	Rajanala et al., 2018
Lack of Evidence	Use evidence-based treatments, avoid unproven claims	Carruthers et al., 2015
Social Media	Provide reliable content, counter misinformation	Rajanala et al., 2018
Informed Consent	Ensure clear information, cooling-off periods for minors	ASPS, 2025
Overuse	Prioritize subtle enhancements	Funt & Pavicic, 2013
Competence	Practice within training boundaries	ASPS, 2025

Social media, especially TikTok, drives rejuvenation with high engagement from non-physician content (Rajanala et al., 2018). This creates information asymmetry, as physician content is more reliable but less engaging. Filters contribute to unrealistic expectations, complicating informed consent (Rajanala et al., 2018). Clinicians must provide evidence-based social media content to educate patients.

Limited long-term efficacy data for injectables in younger adults highlight the need for RCTs focused on prevention (Carruthers et al., 2015). Standardized protocols, integration of longevity

science (e.g., NAD<sup>+</sup> restoration), and AI-driven dermatology (Ghalamghash, 2024a, 2024b) require exploration. Longitudinal studies on psychological impacts and age-specific guidelines are critical.

## 5. Conclusion

Prejuvenation shifts aesthetic medicine towards prevention, driven by minimally invasive technologies and social media. Modalities like neuromodulators, fillers, lasers, microneedling, peels, and topical agents maintain skin health. However, long-term preventative evidence is lacking, necessitating robust RCTs. Ethical practice requires BDD screening, expectation management, and evidence-based interventions. Future research should integrate longevity science and AI-driven approaches (Ghalamghash, 2023a, 2023b), with standardized guidelines to ensure holistic care.

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