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VIEWPOINT Women in Facial Plastic Surgery

Perimenopausal Nuances in the Aging Face: A Comprehensive Perspective

Lindsey Pennington, MD,[1,*] Mary Claire Haver, MD,[2] and Sabrina Fabi, MD[3]

Abstract

Introduction: Perimenopause accelerates facial aging through hormonal, structural, and psychosocial changes, presenting unique challenges for facial plastic surgeons.

Objectives: This viewpoint article integrates two key perspectives: (1) psychosocial impacts and patient-centered care, contributed by Dr. Mary Claire Haver, a board-certified obstetrician-gynecologist and menopause specialist; and (2) hormonal influences and strategic interventions during perimenopause as a critical window for rejuvenation, contributed by Dr. Lindsey Pennington, who emphasizes integrated surgical and non-surgical approaches and notes a trend toward earlier interventions.

Conclusions: By combining Dr. Haver's insights on hormonal and emotional contexts with Dr. Pennington's clinical observations experience, and Dr. Sabrina Fabi's research on skin health and tissue regeneration, we provide a holistic framework for addressing perimenopausal facial aging.

Introduction

Perimenopause, typically occurring in women in their late 30s to early 50s, is the transitional phase before menopause, characterized by fluctuating hormone levels, irregular menstrual cycles, and symptoms such as hot flashes, mood changes, and sleep disturbances.[1] While there are over 97,000 articles on menopause, only 6,500 address perimenopause, with none solely focused on treatment. Unlike menopause, defined as 12 months without menstruation with lower but more stable, predictable estrogen levels, perimenopause involves a gradual, irregular estrogen decline, directly impacting skin, fat, and bone structure.[1–3] These perimenopausal hormonal changes accelerate facial aging, creating a complex interplay of physical and emotional challenges.[1] This article integrates psychosocial, hormonal, and structural perspectives to provide a comprehensive approach to perimenopausal facial aging, emphasizing early intervention and patient-centered care.

Psychosocial Impacts and Patient-Centered Care in Perimenopausal Aesthetics

The emotional and physical toll of perimenopause drives many women to aesthetic medicine, not out of vanity, but from a deep desire to reconnect with a version of themselves they fear they've lost. They're not just seeking smoother skin or fuller cheeks; they're seeking recognition. They know something has changed; they just haven't found a provider who can name it.

Perimenopause doesn't happen in a vacuum. It often coincides with peak caregiving years, career pressures, and evolving long-term relationships. Many women are navigating this hormonal upheaval while managing sleep disruption, metabolic shifts, mood volatility, and physical fatigue. Many arrive in aesthetic clinics feeling emotionally depleted, metabolically burdened, and invisibly aged.

Aesthetic providers are uniquely positioned to interrupt this cycle but shouldn't provide oversimplified solutions or beauty-focused interventions that ignore the hormonal causes. It reinforces the stigma and silence they've already endured in traditional health care settings.

Understanding Hormone-Related skin changes

Declining estrogen directly affects skin health: typically commencing with skin dryness from an increase in transepidermal water loss from a decrease in lipogenesis in

[1]*Lindsey Pennington M.D. Facial Plastics, Shreveport, Louisiana, USA.*
[2]*The Mary Claire Wellness Clinic, Galveston, Texas, USA.*
[3]*Dermatology, University of California San Diego, San Diego, California, USA.*

*Address Correspondence to: *Lindsey Pennington, MD, Lindsey Pennington, MD, Facial Plastics, 6030 Line Ave. Ste 110 Shreveport, LA 71106, USA,* Email: surgeon@penningtonfacialplastics.com

KEY POINTS

Question: Can early, integrated interventions (hormonal, non-surgical, and surgical) improve patient satisfaction, outcomes and long-term facial aging trajectories in perimenopause?

Findings: Estrogen decline in perimenopause accelerates dermal atrophy and facial structural remodeling. Hormone-supportive therapy enhances tissue repair and responsiveness to regenerative treatments. Early, hormone-aware intervention may optimize aesthetic durability.

Meaning: Perimenopause provides an ideal window for facial rejuvenation, where a hormone-literate, integrated approach can optimize long-term aesthetic outcomes and patient satisfaction.

human sebocytes, which contributes to moisture retention. This is exacerbated by a decline in mucopolysaccharides and glycosaminoglycans, which improve epidermal barrier function and dermal water retention. A decrease in skin thickness, firmness, and elasticity follows from a loss in collagen production and elastin fiber fragmentation, respectively, which has been associated with impaired wound healing.[2,4–6] Collagen content in the dermis drops by up to 30% in the first 5 years after menopause, contributing to an increase in fine lines and wrinkles.[7] In addition, the presence of estrogen may protect skin cells against oxidative damage, and the dramatic decrease of estrogen levels during menopause could render skin more susceptible to oxidative damage.[8]

As a result, many women develop skin that is visibly aged, more prone to bruising, and slow to heal after aesthetic procedures.[2,9] These are not just cosmetic concerns, as they affect identity, confidence, intimacy, and mental health.

Evidence-Based hormone replacement treatment options

To offer truly patient-centered care, we must move beyond surface-level fixes and address the hormonal shifts underlying these changes. Both systemic and topical hormone therapies have been shown to meaningfully impact skin quality in menopausal women.

Systemic hormone replacement therapy. Estrogen therapy has been shown to increase collagen content and skin thickness, improve hydration and elasticity, and enhance wound healing and barrier function.[3,9–12] Women on systemic home replacement therapy (HRT) had significantly thicker skin and greater collagen density compared to untreated controls.[10] These structural improvements also correlated with subjective improvements in dryness, itching, and resilience.

Although the absolute risk of adverse events remains low, these benefits must be carefully balanced through individualized assessment. Systemic HRT is generally contraindicated for most breast cancer survivors, for example, as studies like HABITS have shown an increased hazard ratio for recurrence.[13]

Other contraindications to systemic HRT, such as a history of VTE or known coronary heart disease, are often less prevalent in perimenopausal women[14] While relative risk of VTE (2.02) and stroke (1.32) are elevated across all groups, subgroup analysis suggests that initiating HRT during perimenopause actually lowers mortality and cardiovascular events, as well as depressive symptoms.[14]

Topical estrogen therapy. For patients unable or unwilling to use systemic hormones, topical estradiol or estriol can offer localized skin benefits with minimal systemic absorption. Topical 0.3% estriol and 0.01% estradiol creams significantly reduced wrinkle depth, improved elasticity, and stimulated new collagen formation over 6 months.[15] Notably, the creams had negligible systemic hormone effects, aside from a slight increase in prolactin. Other studies have supported improvements in skin hydration, epidermal thickness, elastic fiber quality, and pigmentation uniformity.[2,15,16] In a 12-week trial of postmenopausal women not using HRT, once-nightly topical facial application of either estriol 0.3% or estradiol 0.01% versus placebo demonstrated significant improvement in baseline skin dryness, laxity, atrophy, and dullness versus placebo. Several subjects selected for a biopsy study demonstrated increased fibroblast estrogen receptor staining, highlighting again the importance of the hormone on the fibroblast activity.[17]

Because of class labeling, the package inserts for topical estrogen therapies include the same boxed warnings that accompanies all hormone therapy products. Because of minimal systemic estrogen absorption with topical applications, this warning is not evidence-based and adversely affects women's quality of life by discouraging the use of highly effective therapies, with local irritation as the primary adverse event.[18] Low-dose transdermal hormone therapy is not associated with increased thrombotic risk or triglycerides in observational studies, for example.[18] It is also considered on a case-by-case basis for triple-negative breast cancer survivors if perimenopause symptoms are severe. There are also emerging compounds like methyl estradiol propanoate (MEP) which offer estrogen-like effects on the skin without estrogenic activity elsewhere in the body.[19]

Hormonal Influences and Strategic Rejuvenation Interventions in Perimenopause

Perimenopause is the start of the aforementioned skin changes associated with the decline in estrogen.[10] It also

involves subcutaneous fat redistribution leading to mid-face volume loss and jowl formation and bone resorption 10–15% in the maxilla and mandible, deepening tear troughs and softening the jawline.[3] These structural changes, compounded by increasing skin fragility, create a complex aging pattern that accelerates during these perimenopausal years, making it a "tipping point" for facial aging and requiring a multi-faceted approach to address.

Nonsurgical modalities

Medical-grade skincare.

Implementing a medical-grade skincare regimen in early perimenopause is a foundational strategy to mitigate hormonal skin changes. Medical grade products, formulated with higher concentrations of active ingredients, offer superior efficacy compared to over-the-counter options. Prescription retinoids (e.g., tretinoin 0.05–0.1%) stimulate collagen production, increase epidermal thickness by 20–30% over 6–12 months, and improve skin texture, reducing early fine lines.[20] Medical-grade antioxidant serums can help support skin cells that are more susceptible to oxidative stress, such as vitamin C or phytopeptides that bind to the oxytocin receptor, which neutralize free radicals, reducing oxidative stress and further degradation of collagen and elastin.[21,22]

Additional antioxidants like vitamin E and ferulic acid enhance photoprotection and repair DNA damage, with studies showing a 30% improvement in skin radiance and pigmentation uniformity after 12 weeks.[22] Broad-spectrum, mineral-based sunscreens prevent photoaging, critical in perimenopausal skin with reduced repair capacity, preserving skin integrity.[23] Medical-grade moisturizers containing ceramides, glycerin, beta glucan, and hyaluronic acid restore the skin barrier, addressing xerosis caused by reduced sebum production, with trials reporting 40% improvement in hydration after 4 weeks.[24] Novel regenerative treatments, like peptide-based creams containing acetyl tetrapeptide-9 or palmitoyl pentapeptide-4, stimulate collagen and elastin synthesis, with clinical trials showing a 45% reduction in wrinkle depth after 2 months.[25,26]

Complications from skincare introduction are generally minor and include irritation or photosensitivity, particularly with retinoids, requiring graduation introduction and concomitant sunscreen usage.[27] Initiated in the late 30s to early 40s, these interventions delay visible aging, enhance skin resilience, and optimize outcomes of surgical and non-surgical treatments.

Poly-L-Lactic acid.

Despite a 2024 survey noting 82% of surgeons reporting some scarring in facelift patients with prior biostimulator use,[28] a 2024 study in the *Journal of Drugs in Dermatology* confirmed poly-L-lactic acid's (PLLA-SCA's) regenerative effects, enhancing elastin and extracellular matrix components with minimal scarring when properly administered.[29] PLLA is an injectable, biodegradable, non-permanent biostimulator that induces a combination of mechanotransductional and mechanical stimulation resulting in extracellular matrix remodeling and production of collagen, upregulation of elastin, proteo-glycans and multi-adhesive glycoproteins. In addition, PLLA-SCA stimulates adipocyte rejuvenation/adipogenesis and increases the thickness of the dermis and adipose layers following injection.[30] These findings indicate that PLLA-SCA stimulates endogenous regenerative pathways and the array of biostimulatory effects that support overall skin health improvement.

Patients treated with three sessions of PLLA-SCA, spaced one month apart, showed no evidence of scarring or fibrosis 6 months after the final injection compared to baseline biopsies,[31] Studies demonstrate a 66.5% increase in collagen type I within 3 months, along with a 26.1% increase in dermal thickness and a 27% increase in adipose thickness with a doubling of the adipocyte-derived stem cells in the area at six months.[32,33]

PLLA-SCA's gradual results, with 94% of patients reporting sustained wrinkle reduction at 2 years and 95% showing improved skin glow,[31] align with patients' desire for natural rejuvenation, complementing surgical outcomes and supporting early intervention. It should also be noted that the on-label injection of PLLC-SCA should be subcutaneous or supra-periosteal and should not interfere with current deep plane facelift techniques.

Neuromodulators.

Botulinum toxin A is a valuable intervention for perimenopausal patients due to its ability to address dynamic facial lines that often become more pronounced due to the decrease in skin elasticity and collagen production, resulting in the increased visibility of expression lines. Emerging evidence suggests that botulinum toxin A may promote dermal remodeling and enhance overall skin quality over time, supporting its role as a key component of comprehensive aesthetic care during perimenopause. Additionally, a pilot study found that abobotulinum toxin injections in the face, neck, chest, and scalp reduced the intensity and number of hot flashes, as well as associated sweating, in menopausal women.[34]

Energy-Based devices.

Radiofrequency (RF), fractional CO_2, and Erbium lasers stimulate collagen, improving laxity and texture. Fractional CO_2 lasers resurface skin, reducing fine lines and pigmentation, with studies showing 60% improvement in skin texture after 3 sessions.[35] CO_2 laser resurfacing remains the gold standard because of its deep penetration, ablation depth, and

thermal damage. The ultra-pulsed CO_2 specifically, ablates tissue quickly, provides hemostasis, delivers four times more energy per pulse than the super-pulsed lasers, resulting in more new collagen formation than the super-pulsed CO_2 laser.[36] Laser resurfacing can aid in rejuvenating periorbital skin, which is the thinnest skin of the body and most susceptible to the cutaneous changes described above, although it is associated with a long recovery period and more complications. In an attempt to delay blepharoplasty, ultra-pulsed CO_2 is being used to contract periorbital tissue while thickening skin. It also can help with perioral lines that surgery cannot address and where hyaluronic acid fillers are limited without compromising a natural appearance.

Surgical modalities

In the wounds of postmenopausal, estrogen-deficient women, reduced collagen deposition and delayed epithelialization were demonstrated when compared with young women.[37] Furthermore, in elderly females (and males) treated with topical estrogen, increased collagen levels and re-epithelialization were demonstrated at day seven post wounding, coupled with a reduction in wound size, demonstrating the direct impact of estrogen on healing.[37] Early intervention during the perimenopausal window, therefore, can conceivably preserve skin and underlying structures and enhance long-term outcomes when performed when estrogen levels are closest to the premenopausal state. Due to the rapidly changing hormonal and resulting physical landscapes, nuance in surgical technique is often required as well.

Blepharoplasties.

Blepharoplasties address eyelid hooding and under-eye bags, driven by fat redistribution and laxity. Early interventions allow for more transconjunctival lower blepharoplasty approaches, minimizing scarring. Conservative fat excision or fat transposition is required to prevent hollowing, which is critical given the accelerated volume loss of this patient population.[38]

Browlifts.

The increasing demand for browlifts reflects their effectiveness in correcting ptosis, which exacerbates a tired appearance due to collagen loss and bone resorption. Current lateral/temporal and endoscopic brow lift techniques yield longer-lasting, natural results by elevating the brow along anatomically favorable vectors, preserving muscle function, and minimizing tissue trauma, offering a more youthful and expressive appearance compared to traditional coronal or direct approaches.[39]

Rhytidectomy.

In perimenopausal patients, a deep plane approach is preferred over superficial musculoaponeurotic system (SMAS)-based techniques due to its superior ability to address the unique anatomical changes of this population and its ability to age more naturally over time, improving the longevity of the procedure and appeal of early intervention. The deep plane facelift involves dissecting beneath the SMAS, mobilizing a composite flap of skin, fat, and SMAS, which allows for comprehensive repositioning of deeper facial structures, particularly the malar fat pad and nasolabial folds, affected by midface volume loss and fat redistribution.[40] By releasing retaining ligaments, a vertical lift restores cheek volume and improves jawline definition, which is critical in perimenopause, where midface deflation is pronounced. This approach distributes tension across deeper tissues, reducing stress on the fragile, estrogen-deficient skin envelope, minimizing scar widening, and enhancing longevity (10–12 years vs. 5–7 years for SMAS plication).[40,41] SMAS-based techniques, such as plication, primarily address superficial laxity and rely on skin tension, which can lead to earlier relapse in perimenopausal skin with reduced elasticity. The deep plane's shorter incisions and less skin undermining further reduce trauma, supporting natural results and minimizing scarring risk, aligning with patients' desire for subtle rejuvenation.[42] Combining rhytidectomy with fat grafting addresses subcutaneous loss, enhancing outcomes. Fat grafting also introduces adipose-derived stem cells and growth factors, such as transforming growth factor beta, vascular endothelial growth factor, and platelet derived growth factor.[43] These components promote extracellular matrix remodeling, neovascularization, and tissue regeneration, which leads to increased production of Type 1 collagen and elastin.[43] This regenerative effect, particularly noted in nanofat, improves skin quality, reduces fibrosis, and supports long-term volume retention in facial rejuvenation.[43]

Future directions

Hormone literacy for providers should be encouraged and integrated into touchpoints of practice: intake forms that ask about sleep, libido, mood, and menstrual history; counseling around skin and hair changes; and collaboration with menopause specialists when appropriate.

Emerging therapies like stem cell treatments and MEP combined with PLLA and hormonal interventions warrant further study and could enhance outcomes. Longitudinal research on integrating HRT, systemic and topical, with surgical and non-surgical procedures is needed to optimize protocols.

Conclusions

Perimenopausal facial aging requires a multifaceted approach, integrating patient-centered, hormone-literate care with early integrated nonsurgical and surgical interventions to address the multifaceted changes of perimenopause. Surgical procedures like rhytidectomy, browlifts, and blepharoplasties correct significant laxity and ptosis,

while nonsurgical modalities like PLLA, lasers, and medical-grade skin care products restore collagen and skin quality. Combining PLLA with neuromodulators and controlled RF enhances outcomes by addressing volume, texture, and firmness, while hormonal therapies optimize tissue resilience.

This integrated approach aligns with a patient-centered care model, addressing both physical and emotional needs, particularly for patients seeking early intervention. The dynamic hormonal changes of perimenopause also necessitate ongoing treatment adjustments. Regular follow-ups every 6–12 months allow adaptation of surgical and non-surgical strategies, ensuring sustained results as patients transition to menopause. Skin and the practice of aesthetics cannot be separated from psyche. When patients are counseled on short-terms solutions, however, without addressing or at least considering estrogen status, an opportunity is missed to improve outcomes and to make patients feel seen.

Authors' Contributions

L.P. contributed her professional perspective as a double board-certified facial plastic surgeon and expert in facial aging. M.C.H. contributed her expertise in menopause and perimenopause as a board-certified obstetrician and gynecologist and recognized author on the subject. S.F. provided editorial input, drawing on her experience as a board-certified dermatologist with extensive expertise in aesthetics and clinical research. All co-authors and the editor have reviewed and approved the final version of this article.

Author Disclosure Statement

Lindsey Pennington (Consultant/Speaker—Abbvie, Galderma; Investigator/Speaker—L'Oreal); Mary Claire Haver (Founder of The Pause Life™; Chief Agewell Officer with MIDI Health); and Sabrina Fabi (Consultant/Investigator/Speaker—Abbvie, Galderma, L'Oreal, Merz).

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