

Achieving Facial Rejuvenation Through Collagen Biostimulants

Practitioners consider collagen biostimulating injectables and their expanding role in skin rejuvenation

Biostimulating injectables are advanced aesthetic agents, designed to enhance facial rejuvenation by stimulating the skin's intrinsic regenerative processes, particularly collagen, elastin and extracellular matrix (ECM) production.¹ Unlike hyaluronic acid (HA) dermal fillers that provide immediate volumisation, collagen biostimulants promote progressive, biologically driven improvements in skin density, texture, hydration and elasticity.^{2,3}

Common collagen biostimulating materials, such as poly-L-lactic acid (PLLA), calcium hydroxylapatite (CaHA) and polycaprolactone (PCL), stimulate fibroblast activity and promote dermal remodelling, resulting in natural-appearing rejuvenation outcomes.⁴ While all biostimulants promote tissue regeneration, their mechanisms differ; polynucleotides (PNs) and platelet-rich plasma (PRP) provide growth factors and nucleotides to support cellular repair, whereas PLLA and CaHA primarily act as collagen stimulators, gradually enhancing dermal structure and skin quality.^{5,6}

These treatments are increasingly used in modern medical aesthetics to address fine lines, skin laxity and overall skin quality enhancement through minimally invasive methods, with adverse effects typically mild and short-lived.^{2,7} A systematic review and meta-analysis published in the *Aesthetic Surgery Journal* evaluated 25 studies on commonly used biostimulants – including PLLA, CaHA and PCL – and reported a pooled patient satisfaction rate of 91% with low overall adverse-event frequencies.⁸

In this feature, aesthetic practitioner and dentist Dr MJ Rowland-Warmann, and aesthetic practitioners Dr Apul Parikh and Dr Sabika Karim explore the use of collagen biostimulants for facial rejuvenation, outline the key considerations in determining patient suitability and examine how collagen biostimulants may be effectively combined with other aesthetic treatments.

Common skin concerns

Dr Rowland-Warmann observes that in clinic, patients frequently present with dullness, fine lines, reduced radiance and increasing laxity – changes that reflect progressive alterations in dermal structure and function. She notes that around the peri- and post-menopausal stages, skin quality often declines further due to reductions in collagen, elastin and hydration.⁹

Dr Rowland-Warmann explains, “Collagen synthesis decreases by roughly 1% per year from the mid-20s and accelerates after menopause with falling oestrogen levels, resulting in dermal thinning, diminished tensile strength and impaired repair. Collagen biostimulants counter these deficits by inducing neocollagenesis and neoelastogenesis.”¹⁰

Reinforcing the structural focus of these treatments, Dr Karim identifies skin roughness and early to moderate sagging as common clinical indicators of compromised dermal support. She adds, “Biostimulation is also an excellent proactive ageing strategy, supporting ‘collagen banking’ and the long-term maintenance of skin quality.”¹¹

Assessing patient suitability

When assessing patient suitability, Dr Parikh emphasises that chronological age alone is a poor predictor of skin condition. Instead, factors such as genetics, lifestyle and cumulative sun exposure play a far greater role. “You may see patients in their 40s who exercise, use good skincare, avoid sun exposure and maintain a healthy diet, presenting with strong skin quality. Conversely, patients in their late 20s or early 30s who smoke, sunbathe heavily and have poor diets often show significant damage,” he explains.

Additionally, Dr Parikh highlights the importance of assessing skin quality when considering collagen biostimulant treatment for facial rejuvenation. He notes that features such as static lines, dryness and a perceptibly thinner skin texture are key indicators that a patient may benefit from this approach. Referencing the pull test, he elaborates, “When assessing the skin, it may appear drier, and on palpation you'll notice reduced strength and turgor. As you gently pull the skin, it stretches more easily, reflecting diminished collagen and elastin within the tissues.”^{12,13}

While it can be difficult to define a precise age threshold, Dr Parikh suggests that from the mid-30s onwards, collagen biostimulating treatments often become increasingly relevant in clinical practice. Reflecting broader aesthetic trends, he also notes a growing number of male patients seeking collagen biostimulating therapies.

Objective assessment plays a central role in determining suitability. Dr Rowland-Warmann describes evaluating the skin surface, pigmentation and wrinkles using the Glogau scale – which assesses the severity of photoaged skin based on visible wrinkles and overall skin quality – and performing the pinch and push tests.^{12,13}

Dr Rowland-Warmann also highlights the value of collagen biostimulants in patients experiencing rapid weight loss, noting that these treatments can be safely administered alongside GLP-1 medication. She elaborates that in such cases, treatment planning should prioritise patients at risk of significant deflation, using collagen biostimulants – and where appropriate, HA dermal fillers – to help maintain facial volume. This is further supported by a multicentre, open label study of 41 subjects, which found that a combined regimen of PLLA and HA mid-face dermal fillers provided safe and sustained improvements in facial contour, balance and skin quality in patients with facial volume loss after GLP-1 receptor agonist-induced weight loss.¹⁴ “These patients often experience deflation and reduced structural support. Proactive treatment with collagen biostimulators helps maintain facial integrity and supports their new healthy identity,” she explains.

Additionally, Dr Rowland-Warmann highlights that long-term smokers often experience reduced efficacy from collagen biostimulants, highlighting, “The consequence of smoking means collagen is significantly depleted and fibroblast function is reduced.”¹⁵ She also emphasises the relevance of hormonal status in menopausal patients, noting, “Women on hormonal replacement therapy (HRT) show around 10% greater skin thickness due to increased dermal collagen and connective tissue.”¹⁶ This is clinically relevant, as collagen biostimulants depend on functional fibroblasts, so outcomes are typically more predictable in hormonally supported patients than in those who are hormonally depleted.”¹⁶

When assessing patient suitability and unsuitability, Dr Karim notes that all patients are required to complete an Aesthetic Anxiety Inventory questionnaire and are evaluated by a qualified practitioner. She explains that since the outcomes of biostimulatory treatments are significantly influenced by systemic health, her practice also integrates lifestyle and wellness guidance, including hormone optimisation and general health counselling. She says, "Smokers or individuals with excessive sun exposure may experience more modest results," adding, "Patients undergoing weight loss with GLP-1 agonists who are malnourished or have insufficient protein intake are also likely to see reduced outcomes."

When performing biostimulatory treatments, the practitioners advise investing in good quality before-and-after imaging capabilities that can track facial structures, skin quality and volumetric change over time. Dr Karim shares her use of the Aura 3D system, saying, "This approach enables us to establish baseline skin health, track progress objectively and ensure that treatment planning is tailored and measurable – not only through visible improvement, but also through quantifiable biomarkers of skin quality."¹⁷

Product selection

Common collagen biostimulating injectables on the market include Ellansé, JULÄINE, HArmonyCa, Radiesse and Sculptra, which stimulate neocollagenesis and gradually improve skin quality, elasticity and facial volume.¹ The three practitioners below discuss their preferred collagen biostimulant and the reasons for their choice.¹

Dr Rowland-Warmann identifies Sculptra as her collagen biostimulant of choice, referring to it as a "well-established PLLA agent," suitable for patients with thin, dull skin. Highlighting its 25 years of clinical use, she explains, "PLLA-based particles induce a controlled inflammatory response, prompting fibroblasts to generate new collagen over several months. I am guided by the durability and quality of these outcomes."¹⁸

Dr Parikh has used HArmonyCa in his practice for the last five years, highlighting research documenting quantifiable collagen production, including ultrasound-verified increases in dermal thickness.¹⁹ While he also recognises the established role of CaHA and its collagen-inducing properties, he

emphasises that HArmonyCa's inclusion of HA provides the added benefit of immediate hydration and a gentle lifting effect.²⁰ "For me, the evidence-based longevity is what stands out to me," Dr Parikh states.

Dr Karim shares that her choice of collagen biostimulant is PLLA-based product JULÄINE, explaining, "It has a long safety record, and its smooth, densely packed microspheres stimulate long-term collagen in a low-inflammatory way."²¹ She elaborates that her product selection is shaped by safety, predictability and the flexibility to tailor treatment, adding, "It provides the ability to customise dosing across multiple facial zones."

Tailoring treatment plans

Dr Rowland-Warmann explains that Sculptra is administered using a cannula, placed immediately under the dermis where fibroblasts reside, allowing for predictable placement and minimal bruising. She notes that for GLP-1 patients

– who are at risk of significant weight loss – generally require more Sculptra and possibly additional sessions compared to other patients.²² "A general guideline is one vial of Sculptra per 10 pounds of expected weight loss, adjusted throughout the patient's weight loss journey," Dr Rowland-Warmann notes.²² She adds that patients seeking both rejuvenation and contour improvement may benefit from targeted placement along the cheek and lateral face to enhance shape.

Dr Parikh notes that when using his product of choice, HArmonyCa, he employs a 22G cannula, elaborating, "The advantage of a cannula is that with just a few entry points, you can effectively access and treat almost the entire face." Dr Parikh highlights that cannulas are generally regarded as safer than needles because their blunt design allows them to "usually glide around blood vessels and nerves," reducing the risk of bruising and vascular occlusion, although rare intravascular cases have been reported.²³

In practice, HArmonyCa is supplied in a 1.25ml syringe, with one syringe per side typically sufficient for younger patients with minimal collagen loss.²⁶ He adds that additional syringes may be required in areas such as the jawline, with retreatment usually not needed for 15-18 months.²⁷ Reflecting on individual treatment plans, Dr Parikh states that younger or healthier patients may respond well to a single syringe, while those with more advanced signs of ageing may benefit from a structured treatment plan delivered over several sessions.



Figure 1: Patient before and four months after treatment using HArmonyCa, Skinvive and neurotoxin. Images courtesy of Dr Parikh.



Figure 2: Patient before and seven months after treatment using three vials of JULÄINE. Images courtesy of Dr Karim.

Dr Karim elaborates on her individualised approach to treatment planning. She notes, "Each plan is fully tailored to the patient. JULÄINE is typically reconstituted with 5ml of bacteriostatic saline, which allows controlled allocation across areas such as the periorbital region, forehead, cheeks, jawline, nasolabial folds, marionette lines, perioral area and the neck."

Dr Karim continues to discuss dosage in correlation with age groups, saying, "I rely on internal, off-licence protocols that guide dosing according to age and collagen status. For patients in their late 20s to 30s, I usually administer three vials in a single session for early intervention." Further outlining her approach, she adds, "In those in their 40s to early 50s, three vials are used for the face, with additional treatment for the neck when indicated. From the late 50s onwards, up to six vials may be required across multiple sessions."

Outlining her use of a 25G or 27G cannula, Dr Karim addresses aspiration, explaining, "Aspiration is not required with JULÄINE, as the technique is retrograde linear threads with a cannula. If I am injecting HA or other gel like substances with a needle I will always aspirate, slowly and steadily and wait to 10 seconds at least prior to injecting."

Combining collagen biostimulants with other aesthetic treatments

Reflecting on combination treatments, Dr Rowland-Warmann says the correct treatment stacking can trigger the body's regenerative potential. She continues, "This means maximising synergy between modalities by targeting different tissues to amplify collagen stimulation for lasting results." Whilst discussing her use of Sculptra in clinic, she shares her combined approach with Plinest PNs and Restylane Skinboosters to promote comprehensive rejuvenation, noting, "There is no hard and fast rule here," when discussing the order of treatment stacking. Dr Rowland-Warmann also reflects on volume replacement with collagen biostimulating treatment, highlighting, "Although treatment plans are no longer as HA heavy as they used to be, I still supplement volume with HA injectables from the Restylane portfolio to provide a complete plan to patients."

Dr Parikh notes that both combination treatments and staggered methods can achieve good outcomes, but he prefers a comprehensive single-session approach – most often treating with HArmonyCa and HA injectable Skinvive on the same day. On Dr Parikh's preference, combination treatments deliver multiple interventions in a single session for immediate synergistic effect, whereas staggered treatments space interventions over time to allow individual assessment and optimisation.²⁸ He says, "Alongside collagen stimulation with HArmonyCa, Skinvive enhances results by delivering HA into the superficial layers of the skin, providing a significant boost in hydration. Clinical studies show these results can last for up to nine months."²⁹

Dr Parikh further explains that combining collagen biostimulants with neuromodulators integrates effectively, as the two modalities together help soften crease lines and wrinkles.³⁰ He also highlights the value of combining collagen biostimulants with microneedling, sharing, "You're stimulating collagen levels, whilst improving pigmentation and scarring." He clarifies that there is no prescribed order for these treatments. Additionally, Dr Parikh expresses his appreciation for light-emitting diode (LED) therapy following collagen biostimulating treatment, recommending 20-30 minutes of red LED exposure to support collagen and optimise outcomes.³¹

Dr Karim explains that the most effective facial rejuvenation relies on a multimodal approach, as ageing affects all skin layers and underlying structures. She notes that injectable treatments are now commonly combined with exosome-based therapies and medical-grade skincare to enhance skin health and regeneration.

Elaborating on this combined approach, Dr Karim shares that exosomes are applied topically and never injected, and may be used either before collagen biostimulating treatments or three months afterwards. She continues, "While volume loss from bone resorption and fat-pad depletion can be addressed with HA dermal fillers, skin quality and regeneration are optimised through collagen biostimulants such as PLLA, alongside exosome therapies that support cellular signalling and repair."³²⁻³⁴ Dr Karim adds that long-term results are best supported by personalised skincare regimens and regular clinical facials.

Considering complications

In regards to complications, Dr Rowland-Warmann says common side effects include bruising, swelling and bleeding, with infection risk minimised through post-procedure hygiene. She suggests that nodule formation is rare when PLLA is properly prepared, injected and massaged. Dr Rowland-Warmann further elaborates on vascular occlusion, noting, "Vascular occlusion with Sculptra is uncommon due to its liquid form and subdermal injection plane. If it occurs, it is managed using standard vascular occlusion protocols, including the use of hyaluronidase to promote vasodilation and improve blood flow, despite the product not being HA."



Figure 3: Patient before and 12 months after treatment using a multimodal treatment plan with Sculptra, Restylane Skinboosters and energy-based devices. Images courtesy of Dr Rowland-Warmann.

Analysing the safety of JULÄINE, Dr Karim confirms, "Vascular occlusion with JULÄINE is extremely rare due to its liquid consistency and retrograde linear threading technique. If suspected, injection is stopped immediately and managed with saline flushing, massage, warmth and vasodilatory measures." She further elaborates that expected side effects include temporary injection-site reactions, while serious complications are uncommon and minimised through careful assessment, appropriate training, sterile technique, correct dilution, anatomical awareness and adherence to scope of practice.

Discussing potential complications, Dr Parikh notes that the primary adverse effect associated with HArmonyCa is bruising, explaining, "It needs to be massaged to smooth it out and prevent lumps from forming." He further adds that Skinvive presents similarly, with some bruising and occasional minor lumps, which typically resolve within two to five days.

For clinical integration

As collagen biostimulating treatments have become more common in clinical practice, it is important for practitioners to consider the factors associated with their use. When combined with other treatment modalities, they may contribute to improved patient outcomes. Their effects are typically subtle and develop gradually, which should be taken into account during treatment planning and patient consultation to ensure alignment with treatment goals.