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REVIEW ARTICLE

InMode Evoke radiofrequency hands-free facial remodeling for skin rejuvenation

Aleksi J. Hendricks MD[1] | Sheila Z. Farhang MD[2]

[1]University of Arizona Department of Medicine, Division of Dermatology, Tucson, Arizona, USA

[2]Avant Dermatology & Aesthetics, Oro Valley, Arizona, USA

Correspondence
Sheila Farhang, 8580 N. Oracle Rd. Suite 140, Oro Valley, AZ 85704, USA.
Email: drsheilafarhang@avantdermatology.com

Abstract

Demand for facial contouring procedures has increased dramatically in recent years. Common regions of concern for patients seeking a rejuvenated, more youthful appearance include the cheeks, jawline, submental area, and neck. Radiofrequency technology offers a non-invasive and effective method of improving skin laxity and subcutaneous fat in these areas. The Evoke system from InMode Aesthetics is a radiofrequency modality designed to address the lower face and neck that stimulates collagen remodeling for skin tightening and thermal lipolysis for improved facial contour. While alternate technologies for radiofrequency facial remodeling are commercially available, Evoke is the first of its kind in introducing a reliable, operator-independent hands-free device developed based on InMode's proprietary Acquire, Control, and Extend technology targeting the deep fibro-septal network to provide optimal and consistent outcomes.

KEYWORDS
Collagen Remodeling, Facial Rejuvenation, Lipolysis, Radiofrequency, Skin Laxity

1 | INTRODUCTION

Facial skin aging and laxity are common concerns bringing patients to dermatologic attention and are seen to some extent in essentially all adults, becoming more pronounced over time due to cumulative effects of ultraviolet exposure, facial expression, and fat redistribution. Collagen and elastin degradation and decreased production with aging result in thinning of the dermis and gradual decline in skin integrity, elasticity, and moisture retaining ability. Treatment goals in improving skin laxity involve collagen denaturation with subsequent neocollagenesis and remodeling, increased production of dermal elastin and ground substance and tissue contracture by disruption of subdermal fibrous septae, ultimately resulting in dermal tightening and improved facial contour.[1–3]

While surgical interventions have long been the standard approach for definitive treatment of skin laxity, novel non-invasive therapies are now available in the repertoire of aesthetic dermatologic interventions. Non-invasive facial remodeling offers the benefits of improved patient comfort, significantly fewer procedural risks and contraindications and minimal post-procedural recovery time while delivering effective and enduring results. Ideal candidates for non-invasive facial remodeling are patients with skin laxity not extensive enough to warrant surgical intervention, those having had prior surgical intervention and wishing to delay or avoid another, and those desiring non-surgical alternatives for skin laxity.[4] Specifically in areas of the jawline, submental region, and neck, aesthetic goals include structural features of a sharp cervicomental angle and defined jawline as well as tight neck skin without vertical or horizontal banding.[5,6] Achieving these features often requires addressing both skin laxity and subcutaneous adipose tissue for optimal results.

While many technologies exist for skin resurfacing and lipolysis, there remains a treatment gap in non-invasive approaches to address skin laxity. Demand for non-invasive aesthetic procedures is steadily rising, with a 174% increase in minimally invasive cosmetic procedures between 2000 and 2020 according to the 2020 Plastic Surgery Statistics Report.[7] In an era where time and efficiency are the ultimate commodities, non- and minimally invasive procedures are increasingly sought after by both patients and clinicians in order to achieve effective aesthetic improvements while minimizing disruption in patients' day-to-day routines.

Evoke Face and Evoke Neck by InMode Aesthetics are hands-free facial remodeling systems utilizing bipolar radiofrequency (RF) technology targeting the fibro-septal network by delivering precise thermal energy to the dermis and subdermis to improve the contour of common areas of concern including the cheeks, jowls, jawline, submental region, and neck. To date, a major challenge with RF devices has been variability of treatment. Evoke's unique sensor technology maintains a controlled target temperature to achieve a desired result. In addition to Evoke's sensor technology, the operator-independent system further removes variability in energy. Reliable control over thermal energy delivery is key for achieving an optimal result as other technologies may fall short of the target temperature or lack consistency with an increased risk of complications. The customizable controlled settings and hands-free treatment sessions make this innovative device an ideal facial contouring modality from both physician and patient perspectives.

2 | INMODE EVOKE TECHNOLOGY

RF technology is unique in its ability to non-invasively address both skin laxity and undesired adiposity via a single device. Evoke was developed based on InMode's proprietary A.C.E. (Acquire, Control, and Extend) technology targeting the deep fibro-septal network to ensure consistent thermal energy delivery without areas of under- or over-treatment, thus optimizing results and providing reliable outcomes. Evoke is the first and only hands-free thermal remodeling device on the market and allows users to program pre-set treatment parameters for controlled energy concentration at critical temperatures, capable of delivering a maximal RF energy level of 30 and generating temperatures up to 43°C. The indicators on each applicator are calibrated to detect temperature variations and provide automatic feedback to adjust energy accordingly, ensuring uniform and consistent thermal energy delivery. When the device senses that skin temperature has reached a threshold level, RF energy to the specific applicator is temporarily suspended. Evoke functions according to this algorithm throughout the entire treatment to ensure precise energy delivery while protecting the skin surface from overheating. Maintenance of a constant temperature allows for even remodeling of dermal and subdermal tissues over the entire treatment area. InMode's Evoke system is unique and exceptional in its ability to autoregulate energy delivery to ensure effective treatment by achieving target temperatures required for improving skin laxity and subcutaneous adiposity while preventing overly aggressive treatment that could lead to complications.[8]

InMode's Forma bipolar RF technology is similar to that of the Evoke system, but with a greater demand on the provider's time as it is not a hands-free treatment. Forma can be used for skin laxity in additional areas including the forehead, upper and lower eyelids, and nasolabial folds as well as the jowls and neck using a small handpiece that provides real-time thermal sensor feedback to allow automatic adjustment for targeted therapeutic temperature.[5,9] While Forma delivers similar efficacy in skin tightening compared with Evoke, the smaller handpiece and required user involvement may make it more suitable for treating smaller areas of delicate skin such as in the periorbital region and nasolabial folds, while larger surface areas of the cheek, jawline, submental neck and chin may be more easily addressed with the Evoke system's added benefit of increased applicator size and hands-free treatment (Figure 1).

3 | INMODE EVOKE FACE—CHEEK AND JOWL TREATMENT

The Evoke Face treatment utilizes a dual applicator to the bilateral lower cheek and jawline regions with four RF units on each side.[10] RF energy is delivered to the target areas to induce dermal collagen remodeling and subsequent reduction in skin laxity, while RF delivered to the subcutaneous fat disrupts adipose cells and results in improved definition of the jawline with decreased adiposity. Targeted depth settings are adjustable based on individual goals of improving skin laxity versus reducing adiposity and account for patients' unique facial composition. Lower temperature over a shorter time period with consistent energy delivery has been shown to more effectively stimulate fibroblasts and induce neocollagenesis for skin tightening,[8] while higher temperatures and longer treatment duration are required for reduction of subcutaneous adipose tissue (Figures 2, 3).

4 | INMODE EVOKE NECK—NECK AND SUBMENTAL TREATMENT

Evoke Neck features a single applicator to the neck and submental area containing two RF units.[10] Utilizing the same bipolar RF technology as Evoke Face, RF energy is delivered to the dermis and

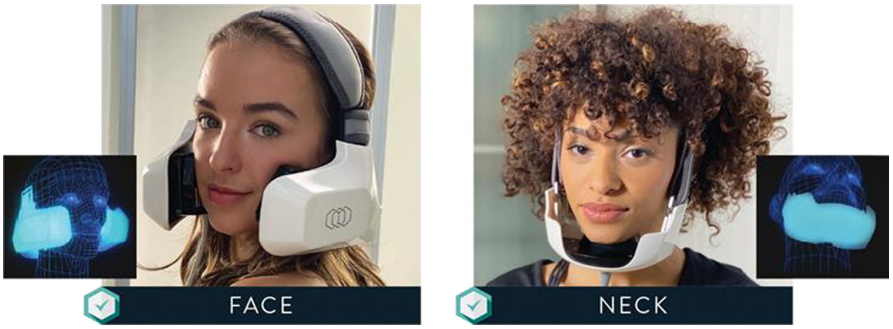

FIGURE 1 Hands-free application of Evoke Face and Neck devices. Photo courtesy of InMode Aesthetics.

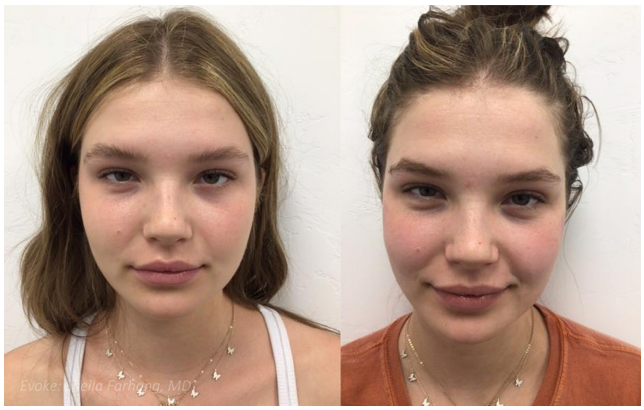

FIGURE 2 Evoke Face before and after. Patient at initial visit and 2-month follow-up visit. Three treatment sessions, 2 weeks apart treated at 43 degrees for 45 min. Note slimming of the lower face and improved jawline definition.

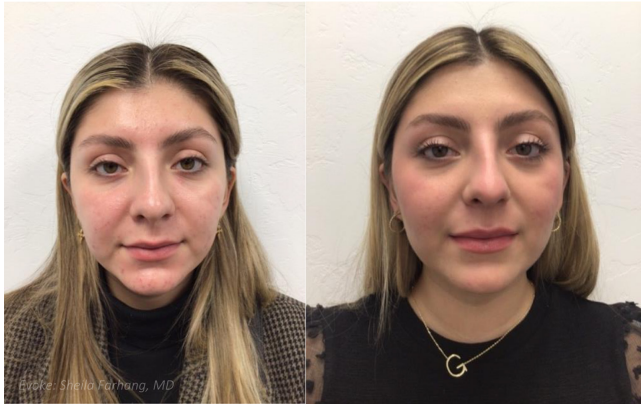

FIGURE 3 Evoke Face before and after. Patient at initial visit and 3-month follow-up visit. Three treatment sessions, 1 week apart treated at 42 degrees for 60 min. Note softening of the nasolabial and melomental folds and improved contour of the jowls.

subcutaneous fat to induce collagen remodeling and neocollagenesis as well as destruction of submental adipose tissue to provide skin tightening and improved chin and neck contour in a region where many experience persistent skin laxity and fat retention even following total body weight loss. RF energy delivery depth is customized to address individual patients' submental contour to safely and precisely target subcutaneous adipose tissue without concern for damage to underlying vital structures in the neck. As in treatment of the face, treatment time and maximum temperature vary according to tissue target, with lower temperature and shorter time utilized for skin tightening and higher temperature over a longer period for targeting subcutaneous adiposity (Figures 4–6).

5 | TREATMENT APPROACHES

5.1 | Patient selection

Evoke treatments are ideal for patients who exhibit mild adipose tissue deposition and mild to moderate skin laxity of the lower face and submental area. It is important to evaluate the patient's end goal—whether that is achieving skin tightening, subcutaneous adipose tissue remodeling, or both.

5.2 | Treatment parameters

Tissue impedance dictates energy delivery to target tissues. According to Ohm's law, where *(energy = current*^{2} *× impedance × time)*, the amount of thermal energy generated by RF is a function of tissue type due to varied impedance when current and time remain fixed. Adipose tissue exhibits greater impedance to energy flow compared with the dermis.[11,12] The Arrhenius equation models soft tissue remodeling dynamics as a function of exposure time and temperature, and demonstrates equivalent collagen stimulation at any point along the curve, such that higher temperatures for shorter time periods are as effective as lower temperatures over extended time periods.[13,14] Practically, consistent heating with lower temperatures over longer treatment time periods has been shown to be more effective in skin tightening due to stimulation of collagen remodeling, elastin production, and fibroblast activity with temperatures of at least 39°C and lower risk of thermal injury.[15,16] Adipocyte apoptosis has been demonstrated to occur at temperatures of at least 43°C.[17] Therefore, shorter treatment duration and lower heat settings are used to achieve skin tightening via stimulation of fibroblasts and neocollagenesis, while extended treatment time and higher heat settings are employed to target subcutaneous adipose tissue remodeling by inducing apoptosis of adipose cells.[11,18] Evoke treatment parameters for skin laxity and adipose remodeling of the cheek and submental regions are specified in Table 1.

5.3 | Treatment schedule

While the number of treatment sessions required to achieve optimal results varies on a patient-to-patient basis, we typically offer a minimum of 3 sessions and recommend 6 sessions spaced 1 to 2 weeks apart. Maintenance sessions are recommended at least every 3 months to provide enduring treatment results. Thicker fibrotic skin may require additional sessions.

5.4 | Adverse events

Evoke treatments are generally very well-tolerated, with several patients likening the sensation to a hot stone applied to the treatment area. Transient erythema is a common response immediately following treatment. Adverse effects are minimal but include temporary swelling and subcutaneous nodules seen in less than 10% of treated patients.[19] Alternative interventions for improving jawline and submental contour, such as injection of deoxycholic acid or cryolipolysis, traditionally target lipolysis alone. While these modalities may achieve a reduction in unwanted adiposity in the jawline and neck areas, they can also result in increased skin laxity

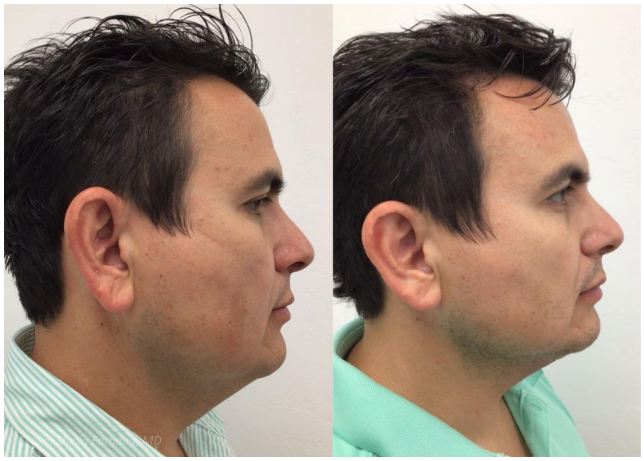

FIGURE 4 Evoke Neck before and after. Patient at initial visit and 2-month follow-up visit. Six treatment sessions, 1–2 weeks apart and treated at 43 degrees for 60 min. Note slimming and tightening of the submental area.

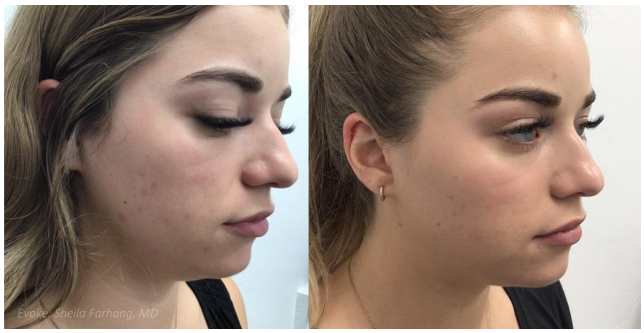

FIGURE 5 Evoke Neck before and after. Patient at initial visit and 2-month follow-up visit. Six treatment sessions, 1–2 weeks apart treated at 43 degrees for 60 min. Note improved jawline definition and reduction of jowl contour.

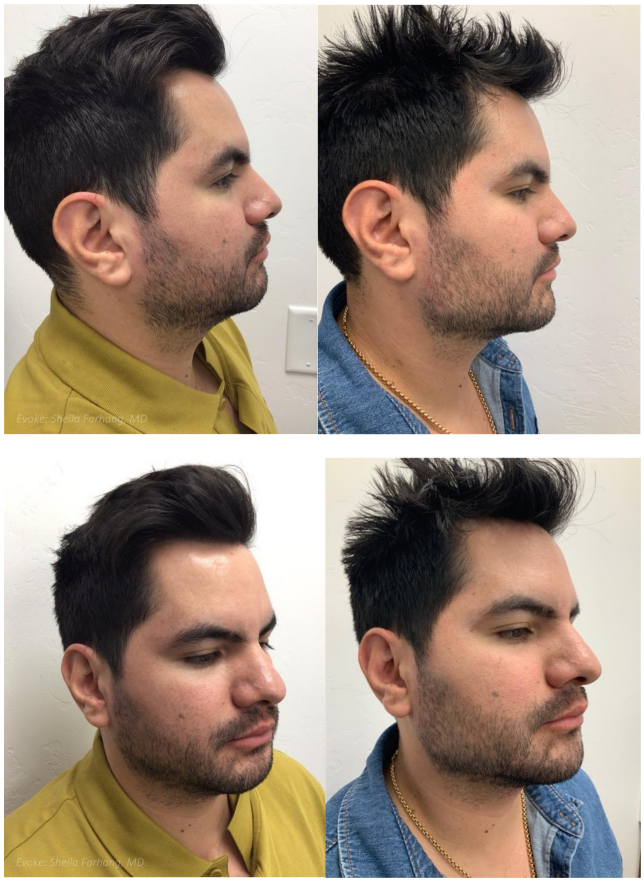

FIGURE 6 Evoke Neck before and after. Patient at initial visit and 2-month follow-up visit. Six treatment sessions, 1–2 weeks apart treated at 43 degrees for 60 min. Patient also received chin and jawline filler during this time frame. Note slimming of the submental area and improved jawline definition. Tissue remodeling via Evoke and structurally enhancing modalities such as filler work exceptionally well in conjunction.

TABLE 1 Evoke treatment settings for skin laxity and adipose remodeling

Applicator	Target	RF energy level	Cutoff temperature (degrees Celsius)	Treatment time (min)
Cheek	Skin laxity	Starting at 20 (and increased accordingly to patient's tolerability)	At least 40 degrees	20–45
Cheek	Adipose tissue remodeling	Starting at 23 (and increased accordingly to patient's tolerability)	At least 42 degrees (as tolerated)	45–60
Chin	Skin laxity	Starting at 20 (and increased accordingly to patient's tolerability)	At least 40 degrees	20–45
Chin	Adipose tissue remodeling	Starting at 23 (and increased accordingly to patient's tolerability)	At least 42 degrees (as tolerated)	45–60

Abbreviation: RF, radiofrequency.

following treatment due to decreased tissue thickness.[6,20] RF provides a well-tolerated and effective approach to skin tightening and fat reduction that is safe in all skin types without adverse effects of local pain, persistent edema, bruising, or paradoxical adipose hyperplasia that can be seen with other treatments for facial contouring.[16,21–23]

6 | CONCLUSION

The Evoke RF system is a novel approach to non-invasive facial contouring. It is safe for use in patients of all skin types and addresses two very common concerns of skin laxity and subcutaneous adipose tissue with a single hands-free treatment modality. Compared with

other existing minimally invasive and surgical interventions for facial remodeling, Evoke offers effective skin tightening and adipose remodeling technology targeting the deep fibro-septal network to ensure that areas are not being under- or over-treated, thus optimizing results and providing consistent outcomes without significant post-procedural edema, swelling, bruising, or scarring. Additionally, the hands-free applicators allow for patient comfort and decreased face-to-face treatment time increasingly desirable for limitation of interpersonal exposure during the COVID-19 pandemic. Practitioners can offer a comfortable and reliable treatment option for patients seeking facial remodeling while also increasing efficiency in their practice with use of a hands-free treatment system.

CONFLICT OF INTEREST

SZF serves as a consultant for InMode Aesthetics, CellFX, GlacialRX, and Procter & Gamble. AJH has no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

ETHICS STATEMENT

The authors confirm that the ethical policies of the journal, as noted on the journal's author guidelines page, have been adhered to.

ORCID

Aleksi J. Hendricks https://orcid.org/0000-0003-3448-5555

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