

# Three stages of body contouring for better patient outcomes: fat, muscle and skin



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*Outcomes and patient satisfaction can be improved through combination treatments*

The opportunities for non-surgical body contouring treatments continue to develop as technological advancements lead to improvements in the consistency and replicability of treatments and their outcomes, albeit patient selection is critical to minimise inadequate results. Practitioner knowledge, skill and experience remain a significant variable in non-surgical treatments, and a high level of commitment is required from the practitioner to develop their knowledge and skill, which leads to better results. The author notes that the absence of advanced training being developed by device manufacturers forces device users to develop and refine their own techniques, which although require a significant investment, does lead to advantages for clinics prepared to do this.

The ability to treat body concerns, which would otherwise have required surgical intervention, is a significant business opportunity for practitioners, although in the author's experience, significant personal commitment is needed to maximise the opportunity that non-surgical devices offer. While perceived as straightforward, devices do in fact require a similar level of skill as for treatments such as injectables, but without the accumulated knowledge base that has developed in the use of, say, dermal fillers. Additionally, patient selection is critical, and, in practice, this more often comes from trial and error as protocols develop.

Furthermore, treatment outcomes can be enhanced by combining modalities, which, in the case of body contouring, includes devices for the removal of excess fat, increases in muscle tone and improvements in skin tone, firmness and texture. In the author's practice, the three stages of body contouring are cryolipolysis for fat reduction, neuromuscular electrical stimulation (NES) for muscle toning and radiofrequency for skin toning, firming and improved texture. By developing combined treatment protocols, treatment outcomes and patient satisfaction are improved.

## Non-surgical fat reduction

The market for body contouring is significant, with the American Society of Dermatologic Surgeons (ASDS) 2018 Consumer Survey indicating that excess weight on any part of the body is the top aesthetic concern. Some 87% of respondents to the 2018 ASDS survey listed removal of excess fat as a treatment of interest, versus 72% for lines and wrinkles, indicating a large potential demand for non-invasive fat-reduction procedures (ASDS, 2018).

However, it is important to stress that non-surgical fat reduction is not a perfect substitute for liposuction, which, according to the American Society for Aesthetic Plastic

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**Table 1. Considerations of surgical versus non-surgical fat reduction**

	Liposuction	Non-surgical treatment
Invasiveness	Aggressive and creates a trauma in the body with soreness, bruising and swelling for approximately 2 weeks following the procedure	Typically gentle with minimal discomfort, both during and after treatment. Some side effects from the treatment include numbness, which resolves around 4 weeks post-treatment
Risks	Liposuction requires an anaesthetic, although increasingly, this can be done using a local anaesthetic. As it is invasive, there are risks of infection, scarring, bruising and seroma collection. Patient experience should be managed as they will be awake	Limited risks, which are well managed. The patient experience is less traumatic than that for liposuction
Results	More dramatic, but the final result cannot be seen due to swelling for around 6 months	Results can be seen as early as 4 weeks, but typically 12–16 weeks for the full results
Downtime	Restricted activities for several days after treatment. Normal activities should be resumed slowly over a longer period.	Can typically return to normal activities immediately.

Surgery (ASAPS), was the second most popular surgical intervention in 2018, while non-surgical fat reduction was the third most popular non-surgical treatment (ASAPS, 2018). There is still a balance to be had, and there are factors which limit the applicability of non-surgical treatments, which are more suited to those closer to their ideal weight and simply looking for targeted fat reduction of stubborn areas.

In the author’s practice, the choice for patients between liposuction and non-surgical options comes down to personal preference and lifestyle, as well as patient expectations. By working closely with a consultant plastic surgeon, practitioners can provide patients with treatment choices, but more often the decision comes down on the side of the non-surgical option. In summary, the general considerations of surgical versus non-surgical fat reduction can be seen in *Table 1*.

Several modalities exist for non-invasive fat reduction, including lasers, high-intensity focused ultrasound and cavitation; however, in the author’s practice, the most effective method has been found to be cryolipolysis. Cryolipolysis is a relatively new treatment for fat removal, having been initially investigated in the mid-2000s, and first commercialised under the brand name CoolSculpting (Zeltiq), which gained US Food and Drug Administration clearance in 2010. Since this time, the technology has been developed and refined, but has also been replicated by many manufacturers who have tried to emulate the original principles of cryolipolysis in the function of their devices. In addition to the increased prevalence of cryolipolysis devices, several other modalities have been developed, yet cryolipolysis remains the best researched modality, with high levels of patient satisfaction (Krueger et al, 2014).

### Patient selection for cryolipolysis

Regardless of the modality, several factors influence the efficacy of non-surgical fat reduction procedures. A literature review carried out by Ingargiola et al (2015) revealed that cryolipolysis reduction in calliper measurement ranged from 14.7% to 28.5%, and an average reduction by ultrasound ranged from 10.3% to 25.5%. Therefore, cryolipolysis should not be considered a weight reduction procedure, but rather a method for targeted fat reduction and asymmetry correction. In the author’s experience, and consistent with the work of Ingargiola et al (2015), cryolipolysis is ineffective at reducing significantly large amounts of adipose tissue. During patient selection, it is important to remember that the ideal patient for cryolipolysis treatment should be close to their ideal weight, undertaking regular exercise and following a healthy diet before the procedure. Issues with the treatment outcome are more often seen by those who gain weight in the months following treatment, which can negate any loss achieved in treatment.

Interestingly, the issue of treatment outcomes and ethnicity factors are being increasingly discussed, particularly the treatment of South Asian patients. Kohli et al (2007) looked at the susceptibility of the South Asian population to central obesity and discussed the differences between Europeans and South Asians. They hypothesised that the South Asian population have a lower fat storage capacity in their primary adipose tissue compartment than European populations. Another study investigated the differences in the subcompartments of subcutaneous adipose tissue in European and South Asian populations and found that the latter tend to store fat in the deep subcutaneous compartments more so than Europeans (Kohli et al, 2012).



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*The patient's choice between liposuction and non-surgical options comes down to personal preference and lifestyle, as well as their expectations*

This difference in the storage of fat would likely explain the lower fat reduction achieved with South Asian patients, as non-surgical techniques are only able to target the superficial adipose tissue, rather than deep subcutaneous adipose tissue compartments. In the author's own experience, non-surgical fat reduction treatment outcomes for Asian patients are generally less dramatic, and this is consistent with anecdotal evidence of clinics working with high numbers of South Asian patients in India.

Other factors to consider during consultation are contraindications, which, for cryolipolysis, include things such as a hernia, diastasis recti and paroxysmal cold haemoglobinuria. In the author's practice, certain contradictions do not prevent treatment but should only be performed where the practitioner has sufficient experience, knowledge and training. In the author's clinic, patients with certain contraindications are treated successfully, although the outcomes for patients with diastasis recti are less than optimal when treating the stomach. The 'sagging' of the stomach, which can occur as a result of diastasis recti, can limit the aesthetic outcome. In these instances, the option to improve the patients muscle tone is important and the author is currently undertaking a limited study into the use of neuromuscular electrical stimulation (NES) using

the Stimsure device from Cynosure. In addition to specific medical concerns, the use of NES can assist with general aesthetic concerns by strengthening the core muscles, as well as other major muscle groups that help to improve a patient's silhouette. Interestingly, in the limited cases to date, the use of NES has had wider lifestyle benefits, such as reduced back pain, which is likely a result of improved core strength.

### Neuromuscular electrical stimulation for muscle development

A natural part of ageing is muscle loss (sarcopenia), and it is reported that we will lose approximately 5% of muscle mass each decade after the age of 30 (Bauer et al, 2019). Muscles have functional uses, which NES devices can address, as well as aesthetic concerns. When addressing aesthetic concerns the in-demand areas are the abdomen and buttocks, but, increasingly, the legs and arms too. When used in combination with fat reduction procedures, NES is an ideal add-on treatment for the abdominal area. Improved abdominal muscles lead to enhanced treatment outcomes by toning the muscles and further slimming the stomach. NES is also a potential treatment for, and has the potential to address, medical concerns such as diastasis recti.





While the stomach is one of the main areas for treatment, increasingly, the arms and legs are growing in popularity

### How neuromuscular electrical stimulation works

NES works by using electrical impulses to directly stimulate motor neurons that elicit a muscle contraction. NES devices allow for deep, intense and complete muscular contractions without activating the central nervous system and has the benefit of not stressing the joints and tendons. In the author's clinic, the StimSure NES device from Cynosure is used, which causes approximately 20 000 individual contractions in a 30-minute session. This is the same number of muscle contractions from around 800 sit-ups. Filipovic et al (2012) found that the use of NES by top level athletes was effective for developing physical performance and concluded 'NES offers a promising alternative to traditional strength training for enhancing the strength parameters and motor abilities in athletes'. Therefore, it is expected that the use of NES for aesthetic patients can have a meaningful impact on muscle tone. However, it is likely that the ability of NES to 'recruit' muscles and stimulate growth will be impacted by the patient's existing muscle tone. Consideration should be given to the patient's level of physical activity and pre-treatment muscle tone, as these factors will influence the protocol delivered and the sustainability of the improvement. Patients who are physically fit are likely to see the greatest gains and maintain the results for longer.

### Neuromuscular electrical stimulation patient selection and treatment

A leading NES device manufacturer recommends a protocol of four sessions of 30 minutes to achieve optimal results; however, discussions with Heiko van-Vleit, professor in functional anatomy at the University of Lausanne, Switzerland, outlined to the author that the results of NES will occur at different rates for different patients. The types of patients and their response to NES can be broadly put into three categories:

1. Those who regularly undertake physical activity at least 2–3 times a week and have a good level of fitness will see rapid results, which will be maintained for long periods
2. Those who undertake some exercise but have historically been very fit (as this influences the ability of the NES to recruit muscle fibres) demonstrate good progress, as the time to recruit muscles fibres will be less, albeit maintenance treatments will be required sooner as general activity required to maintain the results will be less
3. Those who have poor fitness (present or historical) and who do not regularly exercise are unlikely to be a suitable candidate for NES.

Wall et al (2013) state that even inactivity of muscles for periods of less than 10 days is likely to lead to atrophy and, therefore, a deterioration of the gains made in NES treatments is likely where the patient is not regularly active and engaged in exercise. Protocols for treatment in the author's clinic can be as often as twice a day for issues related to functional concerns, whereas for aesthetic indications, treatments are performed on a muscle group every 3–4 days for up to eight sessions. Maintenance sessions are then offered, which help to support the results. As the use of NES is an emerging area in aesthetics, practitioners will need to be flexible and adapt their protocols and consider that patient outcomes must be supported by an active lifestyle or, for those patients who are inactive, a clear understanding that NES will not prevent atrophy.

### Neuromuscular electrical stimulation and medical indications

NES has potential applications beyond the aesthetic results, and the author is currently undertaking a study into the use of NES for the treatment of diastasis recti. Strengthening the abdominal muscles can help to improve the appearance of diastasis recti, while also reducing lower back pain, which is often associated with the condition. NES has also been used by the author in the use of postural concerns, which have both an aesthetic, as well as functional impact. In one case, a professional bodybuilder's posture was corrected following overtraining of the pectoral muscles, which had led to an imbalance in the rhomboid and scapulae.

### Skin laxity following fat removal

Following the removal of fat, many patients are concerned that they will be left with loose skin. Generally, the volume and rate of fat removal that occurs in non-surgical fat reduction does not usually result in loose skin, and this has only been reported in two cryolipolysis cases delivered by the author. In these instances, up to three treatments were repeated to remove larger volumes of fat in patients with existing poor skin tone. This is consistent with the experiences of Stevens (2014) who noted that, 'We have delivered more than 8000 treatment cycles to date, and skin laxity has never been noted to increase following treatment, even after significant fat volume reduction; we estimate that a quarter of our cryolipolysis patients show visible improvement'.

In instances where skin laxity has occurred from cryolipolysis, these were expected and identified early. In these cases, the laxity was successfully treated using focused monopolar radiofrequency. However, more broadly, there do remain issues of patient selection when treating skin laxity with non-surgical methods, particularly monopolar radiofrequency. As noted by McDonald (2014), the variability of treatment outcomes with monopolar radiofrequency is significant and is hypothesised that it

is likely due to a combination of age and heat tolerances. The use of monopolar radiofrequency is most often limited by a patient's tolerance to heat and, as such, fractional radiofrequency microneedling can be increasingly used.

The benefits of fractional radiofrequency microneedling, over monopolar radiofrequency, include bypassing of the dermis, meaning it is safe for use on skin types I to VI and with little risk of post-inflammatory hyperpigmentation (PIH), and improved pain tolerance as treatment time is less and pain management protocols all but eliminate discomfort. In the author's clinic the Morpheus8 device from InMode is used which can treat up to 4mm in depth and with the benefit of little to no thermal damage to dermis meaning minimal downtime. It is expected that this device will soon provide for better outcomes in the treatment of skin laxity on the body with the addition of an 8mm depth applicator.

### Skin laxity treatments and patient selection

Skin condition is critical for a positive outcome from radiofrequency during skin laxity procedures. Crepey or thin skin should be avoided, as these do not respond well to treatment. The author relies on experience, as well as physical examination of the patient using a pinch test. Again, the ability of a practitioner to identify appropriate candidates most often comes from experience. It should be noted that, when using fractional radiofrequency microneedling, particularly with the Morpheus8 device, a certain amount of fat contraction can be achieved. Generally, some improvement will be seen in all patients but, again, the author finds patient expectations need to be managed as outcomes can be difficult to predict for reasons that are not always obvious during assessment.

### Conclusion

Achieving good outcomes from body contouring requires commitment to understanding the technology and a willingness to invest in multiple modalities, as combination treatments provide better results. Non-surgical fat reduction requires strong competencies in the chosen technology, general medical and anatomical knowledge (particularly in the assessment of the contraindications) and an artistic eye. When done well, non-surgical fat reduction can achieve pleasing results that, while less dramatic than surgery, carries less risk of complications. However, it is important that patients are aware of the limitations, and patient selection is critical to achieving acceptable treatment outcomes.

NES is a significant step in non-surgical body contouring and not only provides improvements in physical form but can contribute to improvements in function. The author is in the early stages of protocol development with NES, but the uses for NES so far appear to be broad and is an ideal adjunct to both non-surgical, as well as surgical, fat reduction.

Skin laxity is a further opportunity for practices looking to develop their body contouring services. A range of devices using various modalities exist, and research is necessary to identify a technology that best suits the type of patients seen and the level of skills and experience of those performing the treatment. The author has found impressive results with fractional radiofrequency microneedling.

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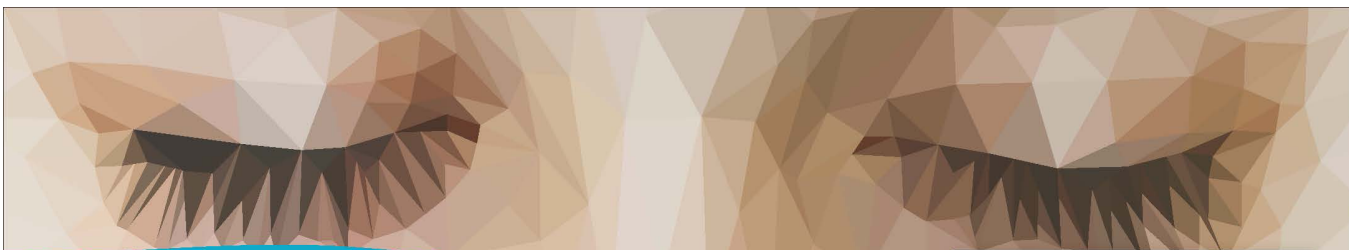
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