

# Modern Aesthetics®



## **BTL'S EMSCULPT NEO:**

THE WORLD'S FIRST AND ONLY  
HIFEM & RF COMBINATION



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LPT<sup>neo</sup>



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**Melanie D. Palm, MD, MBA**  
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## BTL'S EMSCULPT NEO: THE WORLD'S FIRST AND ONLY HIFEM & RF COMBINATION

Advances in the minimally invasive body-contouring category have sired a revolution, and now results once only possible with surgery can be achieved with energy-based devices. The body contouring market is set to increase from \$671.8 million in 2015 to more than \$1.1 billion by 2022, representing a compound annual growth rate of 7.9 percent, according to research and consulting firm GlobalData.

In recent years, the advent of muscle-toning technology, beginning with the approval and introduction of BTL's EMSCULPT in 2018, disrupted this already-hot category that formerly comprised fat reduction and skin tightening.

Now BTL is set to disrupt the market even further with the advent of their latest game-changing device: EMSCULPT NEO.

EMSCULPT NEO is the first medical device that combines high-intensity focused electromagnetic (HIFEM) energy and novel synchronized radiofrequency (RF) technology and emits them simultaneously via dual-field applicators, producing synergistic benefits that far outweigh what would be seen with either technology alone.

This is a case of technology meeting and exceeding demand, says David J. Goldberg, MD, JD, Director, Skin Laser & Surgery Specialists of NY/NJ, Clinical Professor of Dermatology at Icahn School of Medicine at Mount Sinai in New York City, and Clinical Professor of Dermatology and Chief of Dermatology Surgery at UMDNJ-Rutgers Medical School in Newark, NJ. He is also an Adjunct Professor of Law at Fordham Law School in New York City.

"Non-invasive body contouring involves two aspects: removal of fat, and enhancing muscle tone," Dr. Goldberg says. "Technology could do one at a time, but never both at the same time. BTL is the first device company to offer this, and this is something almost every patient wants."

Both fat and muscle contribute to overall body con-



BEFORE



AFTER EMSCULPT<sup>neo</sup>



3 MONTHS AFTER THE LAST TREATMENT, COURTESY OF: DAVID KENT, M.D.

tour—25 percent and 35 percent, respectively. Research shows that consumers are interested in a treatment that primarily sculpts, but that also reduces fat, and that fully 80 percent of people would replace working out with non-invasive treatments if they could.

Treatment with EMSCULPT NEO is a no-brainer, Dr. Goldberg adds. “It is less time consuming and offers more bang for the buck—with better results. This is the next dimension in body contouring.”

Melanie D. Palm, MD, MBA, assistant clinical professor at the University of California, San Diego and medical dermatologist and cosmetic surgeon at Art of Skin MD in San Diego, concurs.

“Everyone is busy these days; it is difficult for patients to come in eight to 10 times to do separate fat and muscle procedures,” she says. “My patients love EMSCULPT NEO because the device does both the procedures simultaneously in 30 minutes.” There is no prep-time, post-care, or downtime with EMSCULPT NEO, she adds.

## A DEEPER DIVE INTO EMSCULPT NEO TECHNOLOGY

Surgical fat reduction options include liposuction, while the non- or minimally invasive methods include radiofrequency, laser energy, cryolipolysis, and ultrasound. For muscle toning, surgical options include abdominoplasty and implants, while the non-surgical vertical consists of HIFEM. EMSCULPT NEO marries radiofrequency and HIFEM in one treatment.

This is only possible because of the special design and structure of the device. Each EMSCULPT NEO applicator contains hundreds of specifically designed electrode fragments that are synchronized with each other and change polar-

ity at the same time. Due to this unique design, the electrodes become transparent to the HIFEM field, and it becomes possible to emit both RF and HIFEM technologies simultaneously through a single channel.

RF electrodes are usually made of metal to conduct currents, but metal objects are contraindicated

with HIFEM because they rapidly heat up when exposed to the electromagnetic field. This makes any ordinary combination of the two technologies impossible. A new coil design with a protective layer isolates all the electrical components inside the applicator from the strong electromagnetic fields.

The heating effects are best matched with specific muscle contraction patterns. As a result, the heating effects are homogeneous across the entire area since the muscle contracts simultaneously and helps with the uniform distribution of the heat. This translates to elimination of hot spots. Moreover, HIFEM fields penetrate through the fragments without creating eddy currents that would in turn create interference. The unique structure of the EMSCULPT NEO also allows extremely fast and homogeneous heating while not interfering with HIFEM. This synchronized RF with patented design is 25 times more effective.

At 30W using this technology, it takes four minutes to reach therapeutic temperature. By contrast, 200W using older RF technology requires 15 minutes to reach therapeutic temperature. EMSCULPT NEO was prototyped with 200W of energy, but its high-energy transmission efficacy makes it possible to use just 30W, making it the new standard among RF technologies in terms of energy transmission efficacy and safety.

“It’s quite remarkable,” says David E. Kent, MD, founding partner of Skin Care Physicians of Georgia in Macon, GA. “What they have done is to come up with the ability to deliver two different types of energy without interference in a single applicator.”

“EMSCULPT NEO is the only technology that takes care of fat and muscle contour at the same time,” says Robert Weiss, MD, a dermatologist at the Maryland Laser Skin and Vein Institute in Hunt Valley, MD. “In the past, we would use one device for fat reduction and a separate device for muscle con-

touring. The EMSCULPT NEO does both through the same paddle. It's pretty amazing."

### RF PLUS HIFEM: EFFECT ON FAT

The combination of the two technologies changes the chemistry and fluid surrounding fat cells, thinning out their cell membranes and making them more susceptible to apoptosis. Histology and scanning electron microscopy performed by Dr. Weiss and others revealed such noticeable shape alterations of adipocytes after the simultaneous treatments, including their flattening, shrinkage, and membrane ruptures. Histological images further showed an increased presence of pyknotic nuclei, indicating strong apoptotic response within the tissue, leading to permanent fat cell death. This has been especially notable in the microscopy images, which showed whole lobules of fat cells being destroyed. Moreover, the size of surviving adipocytes was found to be decreased by up to 31 percent due to the lipolytic release of intracellular content.

"The radiofrequency will open up blood flow and stimulate the fat cells in a different way than HIFEM alone," says Beverly Hills plastic surgeon Brian Kinney, MD.

Richard Goldfarb, MD, a plastic surgeon in Langhorne, PA, agrees. "We are seeing a better muscle development than we did with original EMSCULPT, but we are also seeing a significant amount of fat being disrupted in the subcutaneous region as well in multi-modality studies. I have not seen anything like EMSCULPT NEO before."

The dual field/energy treatment with EMSCULPT NEO has shown to uniformly heat the adipose tissue to 43-45°C, and an effective temperature in the fat tissue is achieved at approxi-

mately four minutes. The superficial temperature measurement taken by the thermal imager showed safe values, avoiding epidermal damage and discomfort due to overheating.

Once the adipocytes are exposed to temperatures in the range of 43-45°C for several minutes, their cellular integrity is compromised and the apoptotic process begins. "In response, the lipids stored in the fat cells, in the form of triglycerides, are hydrolyzed into free fatty acids and glycerol, which are subsequently released to the bloodstream," Dr. Kinney explains.

The apoptotic cells consequently lose membrane integrity and are digested by macrophages and other immune cells, which clear the degraded cells and the debris to maintain tissue homeostasis.

In addition, an ongoing apoptotic process is evident due to the increased presence of the adipocyte's pyknotic nuclei. The histological findings coincided with the scanning electron microscopy (SEM), which revealed smaller and deformed adipocytes, with ruptured membranes and extrusion of lipid droplets outside the cells.

Moreover, the simultaneous application of dual-energy modalities minimizes the risks associated with the localized accumulation of heat, often associated with RF treatments. These "hot spots" were virtually eliminated, ensuring patient safety, as well as increased comfort during the treatment. As a result of this synergy, the heat is distributed homogeneously across the treated area, due to the accelerated blood circulation.

### RF & HIFEM EFFECTS ON MUSCLES

The heat from the RF also affects the muscle tissue which is heated to 40-41°C during the treatment due to relatively



high muscle thermal conductivity. Under normal circumstances the muscular tissue can dissipate the excessive heat accumulation as soon as the temperature exceeds the blood temperature (approx. 37°C) because it is rich in blood vessels. Continuous heat delivery is thus crucial to maintain the temperature elevated at 40-41°C during the HIFEM stimulation, which is essential to boost therapeutic effects such as muscle hypertrophy and hyperplasia.

Studies show that heating of the muscle tissue during contractions causes vasodilatation, which significantly increases the delivery of oxygen and nutrients to the strained muscle fibers, promoting any of the anabolic processes that take place in an organism and are necessary for faster muscle fiber regeneration and growth.

Increased blood flow is also accompanied by faster removal of lactic and carbonic acid, which are byproducts of the metabolic processes that produce energy for the muscles during strength training.

It feels like a strengthening sensation, so patients know that something is happening, says Carolyn Jacob, MD, FAAD, medical director of Chicago Cosmetic Surgery and Dermatology.

"The combination of rapid heat and powerful muscle contractions just feels so good and intense," adds Dr. Palm.

Dr. Weiss adds that the warmth from the RF energy seems to make the HIFEM-generated contractions more tolerable. "It distracts you, and your body doesn't know if it is feeling contraction or heat," he says.

But it's more than just the heat that enhances the muscle-strengthening effects seen with EMSculpt Neo, experts agree. The main synergistic effect of the simultaneous delivery of RF and HIFEM on the muscles lies in the enhancement of muscle hypertrophy.

"When BTL added RF to HIFEM, they got more fat reduction as well as muscle growth, hyperplasia, and stronger, thicker muscle fibers," says Yael Halaas, MD, a facial plastic surgeon in New York City.

The HIFEM-induced supramaximal contractions produce a strong response, triggering muscle tissue hypertrophy. During the intense HIFEM-induced muscle contractions, the muscle fibers are stretched and relaxed, similar to resistance exercise but with a higher intensity. When the workload is large enough, micro-ruptures in the muscle fibers occur, and this causes signaling molecules known as heat shock proteins (HSPs) to be released and activate a regenerative process that strengthens the muscle and prepares it for another workload.

The simultaneous application of heat and mechanical stress showed a significantly higher increase in the expression

of heat shock proteins than was seen with heat or mechanical stress alone, which only confirms the synergistic effect of the two energies for muscle hypertrophy.

Satellite cells, muscle-derived stem cells that are responsible for myofiber development and renewal, also play a crucial role in muscle hypertrophy. These cells are activated by intense muscle exercise and, in turn, regenerate and strengthen the existing muscle fibers. Heat also activates satellite cells.

Satellite cells and HSPs are not the only hypertrophy enhancing aspect. The improvement in the comfort of the contractions allows patients to tolerate higher intensities of the HIFEM field, which improves outcomes as well.

## THE BIGGER PICTURE: GET MORE FOR LESS

The simultaneous application of RF and HIFEM produces results that far outweigh what would occur with either energy alone, says Bruce E. Katz, MD, medical director of JUVA Skin and Laser Center in New York City. "HIFEM, in and of itself, not only builds muscle but also reduces fat, and this has been documented by multiple peer-reviewed studies," Dr. Katz says. "We see 28-30 percent reduction in fat and building muscle of up to 24-26 percent," he says. Calling the EMSculpt Neo "a 2-in-1" device, he adds, "It's a major breakthrough and advance in body contouring."

In fact, studies show that EMSculpt Neo activates muscle-derived stem cells similar to a 12-week resistance training.

The improvements seen in clinical studies for EMSculpt Neo far exceed those seen with any other device on the market, agrees Dr. Kent. "When you look at fat reduction, we see an almost 30 percent reduction in the fat layer, which is greater than any competitor out there, and when you look at what it does for growing muscle, we see around a 25 percent improvement," he says. "This is also over and above what you would normally see with EMSculpt. The Neo is not one plus one equals two. It's synergistic."

"EMSculpt itself has been great for muscle development, and the amount of subcutaneous fat over the treated region was significantly diminished, but not as much as with EMSculpt Neo," Dr. Goldfarb says.

"For trying to reduce fat in a certain area and then tightening the muscle, you now have a device that can accomplish both at a much greater efficacy in one device. Another best part about this technology is that if a patient has a particular spot based fat accumulation, this device can help get rid of those small pockets of fat."

## HIGHLIGHTS

**30% Fat reduction**

**25% Muscle growth**

**Temperature-controlled procedure**

**Adjustable energy based on body composition**

**Synchronized RF plus HIFEM**

**No hot spots**

**No consumables**

**30-minute session**

**Ability to treat patients with higher BMI**

As Prospect, KY-based plastic surgeon Julene Samuels, MD puts it, “this is one of those devices I call a Holy Grail device. It hits all patient concerns. It can address fat and muscle both in a single procedure.”

A study by Jacob and Kent utilizing magnetic resonance imaging (MRI) demonstrated a significant reduction of abdominal fat thickness: 30.8 percent at three months after the dual-energy treatments. Similarly, an additional study,

performed by Katz, et al. used ultrasound to demonstrate an average decrease in fat thickness of 28.3 percent at three months. The results were further maintained at six month follow-up visits after the last treatment.

“RF increases penetration of energy into adipose tissue, so it took it from 19 percent with EMSCULPT alone to 30 percent with EMSCULPT NEO at three months as measured by ultrasound,” Dr. Samuels says.

Muscle thickness increased by 25 percent at three months, and fat reduction and muscle thickness were maintained at six months. “You can also control and dial down intensity,” Dr. Samuels notes. “We see good results even if not at 100 percent.”

This customization is key, adds Dr. Katz. “We can program it for more fat reduction or more muscle toning depending on the patient’s goals.”

“Not only does it treat large areas, but if you have a slimmer patient with protruded pouches of fat, you can spot treat them while making those muscles toned and stronger underneath,” Dr. Palm adds.

## THE EMSCULPT NEO PATIENT EXPERIENCE

Part of the allure of EMSCULPT NEO is the serene, spa-like experience, says Dr. Jacob. “HIFEM technology becomes rhythmic as it goes along, and the addition of the RF leads to this sensation of warmth,” she says, likening EMSCULPT NEO

## PRO TIP: MARKET NEW DEVICES



Looking to launch a new device successfully? Roll out the new treatment to your VIP patients first, preferably at an exclusive “once-in-a-lifetime” price point, such as 25-30 percent off for a limited time, such as 30 days, to instill a sense of urgency, suggests Wendy Lewis, Founder/President of Wendy Lewis & Co. Ltd., a marketing communication and social media boutique in New York City, and author of 12 books including

*Aesthetic Clinic Marketing in the Digital Age.*

And consider allowing long-term patients to bring a friend along to qualify for an additional bonus, such as an extra session or gift card for a different treatment or product.

**To get comprehensive marketing advice from Wendy Lewis and access interactive features of this supplement, read this article online at [ModernAesthetics.com/EmsculptNEO](https://ModernAesthetics.com/EmsculptNEO)**



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3 MONTHS AFTER THE LAST TREATMENT, COURTESY OF: BRUCE E. KATZ, M.D.

been able to make muscles stronger... until now."

Even with high-definition liposuction, we can remove fat over muscles to contour, but if the muscles are flaccid or not toned, there was little we could do."

Surgical patients welcome contouring with EMSculpt NEO to maintain and

treatment to that of a warm massage.

Each treatment takes approximately 30 minutes, and four treatments once a week is the current protocol. "We can apply one or two applicators to the area to be treated," she says. "Most patients lie there and work on their cell phone."

"There was a rapid, very measurable, noticeable reduction in fat with an increase in muscle thickness, and these changes are much better than what we would get alone," Dr. Jacob says, referencing the study she conducted with Dr. Kent.

"It's very exciting," she says. "We were pleasantly surprised at the amount of reduction in fat that patients were getting in just a few treatments."

Patient selection plays a role, Dr. Jacob says. The benefit is more pronounced on people who have more fat to lose, she notes. Unlike other energy-based fat reduction devices, EMSculpt NEO can treat patients with a BMI of up to 35.

Drinking adequate amounts of water before treatment tends to enhance the results, Dr. Jacob says. "We always want patients to have enough hydration before any treatment to aid the breakdown of adipocytes and buildup of tissue."

The EMSculpt NEO is a comfortable patient experience, agrees Dr. Halaas. "Treatments are the same period of a half hour. It's a short learning curve. Really, it's almost just as easy to operate as EMSculpt. The results are excellent, and patients are very happy."

Dr. Samuels says that EMSculpt NEO is a welcome addition to what she is able to offer her patients.

Abdominoplasty flattens the treated area to a certain degree, she says, but if the muscles are flaccid, the results may not be aesthetically appealing. "We can fix diastasis recti and tighten the muscles with corset suturing, but I haven't

enhance surgical results, she notes.

"The device has expanded the group of patients I could attract."

By and large, patients are very pleased with the results: 94 percent of patients were satisfied with the results achieved with EMSculpt NEO.

There are no consumables required with the EMSculpt NEO, Dr. Samuels notes. "You don't have to do anything except turn on the device and place the applicators on treatment areas," she says. "Your staff member can leave and return to adjust or check settings." Unlike other devices, there are no upfront click fees with EMSculpt NEO.

"There is no gel, no muss, and no fuss," Dr. Samuels says. "We affix one or two applicators using a black belt with Velcro to hold it in place." The procedure runs independently once applicators are affixed.

In between patients, a staff member wipes down the applicators with special solvent for applicator surfaces and sanitizes the rest of the office, she explains.

As aesthetic practices begin to reopen after the Covid-19 outbreak, such low-touch procedures will be especially attractive to patients who are looking to minimize the risk of contracting Covid-19 while still meeting their cosmetic goals, she adds. "There's not a lot of touching gels or dressings, and you don't break the skin with EMSculpt NEO."

With EMSculpt NEO, patients achieve more fat reduction and muscle growth in a shorter treatment time with no downtime. As a result, patient satisfaction is high. For providers, EMSculpt NEO requires fewer overhead costs (which can be passed on to patients), less space, and fewer hands on deck to administer the dual treatment; resulting in greater ROI in less time. ■

# EMSCULPT<sup>®</sup> neo

The  
**one**  
in Body  
Shaping

**30-min.  
Procedure**

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3 MONTHS AFTER THE LAST TREATMENT, COURTESY OF: RADINA DENKOVA, M.D.

BEFORE



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1 MONTH AFTER THE LAST TREATMENT, COURTESY OF: BTL AESTHETICS

**Results  
and patient  
experience  
may vary.**

As with any medical procedure, ask your doctor if the Emsculpt Neo<sup>®</sup> procedure is right for you. Emsculpt Neo<sup>®</sup> is intended for non-invasive lipolysis (breakdown of fat) of the abdomen and reduction in circumference of the abdomen with Skin Type I to Skin Type III. Emsculpt Neo<sup>®</sup> is also cleared for improvement of abdominal tone, strengthening of the abdominal muscles and development of firmer abdomen. Strengthening, toning, firming of buttocks, thighs, and calves. Improvement of muscle tone and firmness, for strengthening muscles in arms. ©2020 BTL Group of Companies. All rights reserved. BTL<sup>®</sup>, EMSCULPT NEO<sup>®</sup> and EMSCULPT<sup>®</sup> are registered trademarks in the United States of America, the European Union, or other countries. The products, the methods of manufacture or the use may be subject to one or more U.S. or foreign patents or pending applications. Trademarks EMSCULPT<sup>®</sup>, EMSCULPT NEO<sup>®</sup>, Emsella<sup>®</sup>, EMTONE<sup>®</sup>, EMBODY<sup>®</sup>, and HIFEM<sup>®</sup> are parts of EM<sup>™</sup> Family of products. \*Data on file.

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