

# AccuSculpt Utilizes Adipocyte-Specific Wavelength

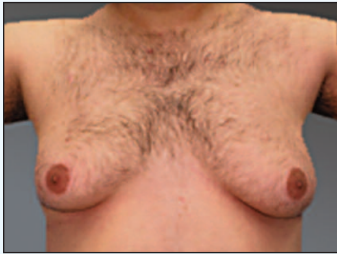
By Kevin A. Wilson, Contributing Editor

As the first FDA approved device using a 1444 nm wavelength laser, AccuSculpt from Lutronic, Inc. (Princeton Junction, N.J.), photo-acoustically emulsifies fat, enabling easier removal during liposuction. This method facilitates a more aesthetically pleasing silhouette for patients regardless of where their trouble spots may be. AccuSculpt, offering laser-assisted liposuction, represents a step forward in body shaping technology.

According to Daniel Man, M.D., a plastic surgeon in private practice in Boca Raton, Fla., the novel idea of using lasers for body shaping was derived from Italy and South America just before the turn of the century. "With less invasive and less traumatic alternatives to liposuction being the trend, the original idea was to use laser energy to emulsify adipose tissue beneath the surface, without mechanical removal, letting bodily processes remove the fat naturally," he said. "However it did not work well. In the worst cases treatment produced lumpiness and patients were unhappy with their results. We realized that emulsified fat needs to be removed with suction in order to maximize outcomes."

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*“The photo-acoustic properties of the 1444 nm wavelength make AccuSculpt extremely efficient at emulsifying fat.”*



Male before Tx



Male after AccuSculpt Tx

Lutronic felt that another part of the problem was the wavelength chosen for the job: the 1064 nm Nd:YAG laser. “The 1064 nm wavelength is a workhorse for aesthetic medicine, but is not ideal for treating adipose tissue,” Dr. Man noted. “Since it is not specific to fat, a tremendous amount of unwanted heat is generated in the surrounding tissue. Energy is scattered and there can be scarring or irregularities, mostly in the abdomen and neck.”



**Daniel Man, M.D.**  
Plastic Surgeon  
Boca Raton, FL

In response to this issue, Lutronic developed a wavelength with ideal characteristics for this indication, instead of simply modifying the power output of an existing laser technology. The result was the 1444 nm AccuSculpt. “Others tried the 1320 nm wavelength, which is better than the 1064 nm, but not as good as 1444 nm,” Dr. Man stated. “The photo-acoustic properties of the 1444 nm wavelength make AccuSculpt extremely efficient at emulsifying fat. The wavelength is highly specific to lipids, as well as water, which makes up about 80% of the fat cell. Energy is not scattered so more fat is emulsified, with less build up of heat in surrounding tissues that don’t have an affinity for the wavelength.”

Laser energy is delivered via a 600 µm optical fiber, inserted through a 1 mm diameter cannula, so it’s minimally invasive. Since the liquefied fat is easy to remove, the small incision may also be used during suction.” The device passes easily through both the fat and fibrous tissue, so AccuSculpt is good for many places on the body which aren’t easy to treat with traditional or regular tumescent liposuction. There is some stimulation of collagen which causes a tightening effect as well,” said Dr. Man.

**Editor’s Note:** In the following clinical roundtable, five top dermatologic and plastic surgeons from around the globe share their knowledge and clinical expertise with laser-assisted liposuction using AccuSculpt. Collectively, these physicians have dozens of years of experience performing body contouring treatments as well as using laser- and light-based therapies for a variety of aesthetic medical applications.

What indications and body areas are ideal for treatment with AccuSculpt? Why?

**James H. Carraway, M.D.** – From what I’ve observed in animal and clinical studies, the 1444 nm wavelength breaks down the cell structure and mobilizes the lipids in fatty tissue. It improves fat removal and facilitates movement of the cannula through tissue to disrupt fat, even in extremely fibrous areas. There are areas of the body that are traditionally difficult for liposuction, such as the relaxed peri-umbilical area in a woman’s abdomen, love handles, abdominal fat on a man, the male and female breasts and fatty tissue in the anterior axillary region.

**W. Tracy Hankins, M.D.** – AccuSculpt is ideal for almost all liposuction procedures because it provides a smoother result. I especially like it for looser areas such as the inner thigh or lower abdomen, but it moves so easily through fibrotic areas that it’s great for problem areas and secondary liposuction as well. Due to the emulsification you can use smaller cannulas when suctioning.

*“Each area has its own unique characteristics, such as thin skin or excessive fibrous tissue.”*

**Un Cheol Yeo, M.D., Ph.D.** – AccuSculpt is good for precise sculpture on areas such as the face, in addition to laser-assisted liposuction of areas where more fat will be removed. It is ideal for gynecomastia and I use it for axillary osmidrosis.

**J. David Holcomb, M.D.** – As a facial plastic and cosmetic laser surgeon I am interested in optimizing protocols and developing new indications for regional treatments within the head and neck. I am exploring the use of AccuSculpt for subregional contouring of discrete facial structures, such as the melolabial fold and jowl.



**J. David Holcomb, M.D.**  
Facial Plastic Surgeon  
Sarasota, FL

Traditional techniques for rejuvenation of the mid- and lower face rely upon manipulation of displaced tissue volume and soft tissue augmentation. The ptotic melolabial fold is inadequately corrected by many well-established face-lift techniques, while dermal filler injections are temporary and less effective with increasing depth of the melolabial fold. Jowling is variably camouflaged or effaced, respectively, via dermal filler material injected into the pre-jowl area or invasive facial surgery. Laser-assisted volumetric contouring of the mid- and lower face, with direct reduction of the fold and/or jowl, is a very interesting concept both as a stand-alone procedure and possibly concurrent with lifting procedures to help achieve a better result.

**Daniel Man, M.D.** – It is simplest to say that AccuSculpt is for sculpting any area of fatty tissue, from the face and neck downward, but I must emphasize that AccuSculpt is best for those areas that are normally challenging and stubborn. Each area has its own unique characteristics, such as thin skin or excessive fibrous tissue. AccuSculpt can handle all of them well. Results are smoother, with fewer depressions or irregularities, but management of patient expectations is still very important.

#### How do the features of AccuSculpt positively affect treatment and outcomes?

**Dr. Hankins** – The way it targets fat so specifically is impressive. Since the device passes through the tissue easily and allows you to use smaller cannulas, it is very forgiving with regard to creating secondary deformities. This detail may make it easier for marketing the device to physicians from other specialties as long as they are trained on how to avoid complications that have been reported with other laser liposuction devices such as, burns and perforations into the peritoneal cavity or even the thorax. Since the energy output of this laser may be easily adjusted down for smaller scale procedures such as a mini face-lift, AccuSculpt is very versatile as well.

**Dr. Man** – AccuSculpt is very powerful, but it's easy to manage that power and direct it to achieve the best treatment results because the interface is extremely user-friendly. Also, the device has a smaller footprint and is easy to maintain. The fiber doesn't char as easily as with the 1064 nm laser so you don't have to trim as often.

**Dr. Holcomb** – The 1444 nm pulsed Nd:YAG lipolysis laser allows safe and effective contouring of smaller tissue volumes in targeted facial subregions, including the medial cheek and lower mandibular border. The short pulse width and specificity of wavelength to water and adipose tissue make it possible to use much more conservative treatment parameters compared to other devices.

*“AccuSculpt is ideal for facial sculpting. The advantage of the 1444 nm wavelength is its highly efficient removal of fatty tissue and selective absorption of energy by fat cells.”*

**Dr. Yeo** – I agree that AccuSculpt is ideal for facial sculpting. The advantage of the 1444 nm wavelength is its highly efficient removal of fatty tissue and selective absorption of energy by fat cells. With its limited heat dissipation to surrounding tissue the 1444 nm wavelength also offers a wider safety margin. With other devices, there is less of a safety margin for the face, so AccuSculpt is very helpful in that area.

**Dr. Carraway** – The AccuSculpt device is designed so that everything is in the right place and very user-friendly. This helps the operator properly control the delivery of treatment energy, so that as you gain experience you can maximize treatment energy without damaging the surrounding tissue. This feature is essential for effective laser-assisted liposuction.



**James Carraway, M.D.**  
Plastic Surgeon  
Virginia Beach, VA

How would you compare laser-assisted liposuction with AccuSculpt to traditional or tumescent liposuction?

**Dr. Man** – I have a lot of respect for traditional liposuction and it still has a place in the armamentarium. AccuSculpt treatment is a bit easier to manage because the laser creates a channel for the cannula, which also makes it easier to suction fat later. Hemostasis is quite acceptable with the 1444 nm wavelength.

**Dr. Carraway** – Using AccuSculpt may add to the treatment time, but in my opinion, if I'm performing traditional liposuction in a difficult area such as the hips and waist on a woman, for example, I can use a larger cannula to achieve the basic contour in a few minutes. However, then I have to switch to a smaller cannula and work under the subdermal fat to finesse the end result. AccuSculpt takes longer but I can use it for the entire procedure, which is easier and may not really add much time at all. Another strength of the device is that by applying heat internally to the tissue structure, you obtain some tightening, but we need more controlled studies on this. These properties, plus fat removal and post treatment compression, provide better contouring sooner.

**Dr. Yeo** – There are many possible adverse effects with traditional or tumescent liposuction due to its invasiveness. Scar formation, suction grooves, post-inflammatory hyperpigmentation, fibrosis or seroma, for example, occur much less often with AccuSculpt. The recovery period is reduced because the procedure is less traumatic.

**Dr. Hankins** – We observe minimal bruising and swelling when we use AccuSculpt with tumescent anesthesia. Treatment is very tolerable; it's the administration of the tumescent solution that patients find uncomfortable. That's just about the same with or without AccuSculpt.

**Dr. Holcomb** – If the patient does not need platysmaplasty, neck contouring with AccuSculpt can be accomplished very effectively with one or more puncture wounds or small incisions. Much smaller cannulas are required to remove the pre-treated fat and large, bulky, circumferential pressure dressings may be avoided in most cases.

*“Wattage is not the issue here, it’s specificity. Power is overrated and is not the key to safe, efficient fat removal.”*

How does body shaping with AccuSculpt affect the overall treatment experience, healing and recovery time?

**Dr. Holcomb** – AccuSculpt moves through tissue easily so it’s less tiresome for the physician as well as less traumatic for the patient. Less trauma means less bruising, less discomfort and less downtime, which makes AccuSculpt laser lipolysis a truly ambulatory procedure.

**Dr. Hankins** – Overall downtime in my experience with tumescent laser-assisted liposuction using AccuSculpt is limited to only a few days in most patients.

**Dr. Man** – With AccuSculpt, patients are back to reasonably normal activities within 24 to 48 hours. We don’t hear many complaints about pain, fluid overload or bruising compared to other methods — in short this means a reduced recovery period and fewer complications. The hemostasis and reduced trauma associated with AccuSculpt are probably most responsible for this.

**Dr. Yeo** – Later this year I will be presenting study results comparing a leading 1064 nm Nd:YAG device to AccuSculpt using porcine fat. These results revealed that AccuSculpt had a quick healing time with less vascular injury. We also saw decreased and rapidly subsiding inflammation versus the competing device, most likely due to the reduced vascular injury.



**Un Cheol Yeo, M.D., Ph.D.**  
Dermatologist  
S & V Dermatologic Clinic  
Seoul, South Korea

How does AccuSculpt compare with competing devices?

**Dr. Hankins** – When you try to adapt existing lasers for lipolysis, it becomes a question of power. Wattage is not the issue here, it’s specificity. Power is overrated and is not the key to safe, efficient fat removal.

**Dr. Yeo** – By using the 1444 nm wavelength instead of simply increasing the power of an existing laser, AccuSculpt is simply better suited for treating unwanted fat. Our results showed that AccuSculpt has more than three times the lipolytic efficacy of another laser system. AccuSculpt needs less than one-third the fluence to achieve the same amount of lipolysis. In the study we measured results by optical coherence tomography. Also, compared to existing lipoplasty devices treatment time is reduced by half in my experience.

**Dr. Holcomb** – The 1064 nm laser was not developed for lipolysis. It penetrates deeply through tissue and the relatively lower tissue water absorption coefficient leads to gradual heat build up, which increases the potential for collateral thermal injury. The 1444 nm wavelength has much greater selectivity for subcutaneous fat and tissue water so it is more efficient, among other things.

Please discuss your pre- and post treatment protocols and how they affect healing and downtime.

**Dr. Man** – I mark patients very clearly and document with photography. I usually perform the procedure with patients under intravenous sedation on what I call a vertical bed. It’s a surgery bed that is elevated 30° upward from the horizontal position. Even that small tilt allows me to see the effect that gravity has on the tissue and I believe this



Male before Tx



Male after AccuSculpt Tx

*“AccuSculpt is an instrument that provides high quality output but demands high quality input.”*



Arm before Tx



Arm after AccuSculpt Tx

allows me to obtain a superior result. Also, I don't close the wounds, instead I allow them to heal on their own which reduces scarring.

**Dr. Carraway** – For six weeks prior to treatment, we put patients on a diet which increases vegetables and reduces sodium and white carbohydrate intake, especially wheat, to reduce water retention and post treatment swelling. After treatment, patients wear a pressure garment and we recommend self massage, which patients find easy to perform. This helps reduce swelling remarkably so that in most cases post-procedure pain and swelling are very minimal.

**Dr. Yeo** – I recommend using a tumescent solution with a concentration of lidocaine that is two to four times higher than normal, therefore less solution is required. After treatment the incision requires only a small bandage plus 24 hour use of a compression garment for three days. For approximately four more weeks patients wear a compression garment for 12 hours a day. Light exercise and stretching can stimulate absorption of remaining emulsified fat.

**Dr. Holcomb** – We use small volumes (approximately 5 cc) of solution to tumesce the medial cheek or jowl areas and larger volumes (up to 50 cc) for the submentum and neck. We also add hyaluronidase to the tumescent solution to facilitate even diffusion through tissue planes.

How do you manage potential adverse events?

**Dr. Man** – First, this is a laser and it should be respected. More specific problems usually involve poor choice of patients, poor planning or poor execution. An experienced, thorough physician working carefully on a patient who has realistic expectations shouldn't have many problems. Also, it is vital to use the smallest cannula possible.

**Dr. Carraway** – I think the most important thing is to remember you're using a powerful laser, which should be in the hands of well-trained personnel who respect that power. If you're inexperienced, not feeling well or sleep deprived, you could unintentionally make a technical error. AccuSculpt is an instrument that provides high quality output but demands high quality input.

**Dr. Hankins** – As long as you are careful about your treatment plane and pay attention to the heat of the skin, you can avoid burns. This is an aggressive device but we haven't had any burns because we're quite careful about watching the skin temperature.



**W. Tracy Hankins, M.D.**  
Plastic Surgeon  
Las Vegas, NV

**Dr. Yeo** – You can avoid dimpling if you don't confine the treatment beam to too small of an area. By evenly distributing energy you minimize lumpiness.

How has AccuSculpt impacted your practice?

**Dr. Holcomb** – AccuSculpt has opened the door to new treatments. It has really changed the way I envision sculpting the face and neck, giving me a third option beyond manipulation of displaced tissue volume and merely adding volume. Patients have warmly embraced this new treatment option.

*“Patients that have previous experience prefer AccuSculpt for the shorter, more comfortable recovery with reduced bruising and swelling.”*

**Dr. Hankins** – Patients are always looking for the latest treatment technology, and this makes it easier for them to get excited about their treatment, which in turn makes it easier to promote the technology.

**Dr. Man** – AccuSculpt achieves results that patients tell everyone about, which brings in more patients. It allows me to offer an alternative to similar devices, ultrasound or regular liposuction with quicker recovery.

Why is AccuSculpt a good choice for physicians with liposuction experience, as well as those without?

**Dr. Yeo** – Since the operating technique is similar, physicians experienced with performing liposuction or laser lipolysis will have a very short learning curve. For those new to liposuction, AccuSculpt has the advantage of being very safe. When you think about physicians performing liposuction for the very first time, it is better to start with AccuSculpt.

**Dr. Man** – For new physicians, there is no substitute for training because there is a lot to know about proper liposuction techniques. I believe there are many advantages to offering early patients free touch-up treatments while you gain experience.

**Dr. Holcomb** – At any level of experience, physicians will find tissue contouring with AccuSculpt to be easier and less traumatic. It can be done through such small entry wounds that it is essentially a closed procedure.

**Dr. Hankins** – I think it opens up two potential markets: one where the patient’s area of concern is not very severe and you don’t want to leave any contour irregularities after liposuction; and another where you might otherwise have to perform a skin excision procedure such as abdominoplasty, which would make good use of the adjunctive tightening effect.

Do you use AccuSculpt for other indications or in conjunction with other modalities?

**Dr. Hankins** – We add VelaShape from Syneron (Irvine, Calif.) to the post-operative regimen because it enhances smoothness, especially in slimmer patients. We get a lot of dancers and model-type patients in Las Vegas; in their professions they can’t tolerate any contour irregularities. I might also use Thermage treatments from Solta Medical (Hayward, Calif.) for additional tightening. We’ve used the smaller tip and the new larger Body Tip as well, which is faster and more tolerable.

**Dr. Holcomb** – I am using AccuSculpt to facilitate contouring of the face and neck and to help raise the flaps during face-lift procedures.

Why does AccuSculpt appeal to patients? What has patient feedback been like?

**Dr. Yeo** – Patients love the smoother results with fewer irregularities, but they also like the minimal downtime and the fact that nobody has to know that they had a procedure done. They can be back to regular activity immediately after treatment. Reduced treatment time versus similar devices is also an advantage.

**Dr. Man** – Patients that have previous experience prefer AccuSculpt for the shorter, more comfortable recovery with reduced bruising and swelling. By and large the treatment experience is better overall as well and patients can resume activities sooner.

*“This laser is not some copy of an existing technology. This is a novel treatment wavelength based on sound science.”*



Before Tx



After AccuSculpt Tx

**Dr. Holcomb** – So far, the reception has been very good. AccuSculpt is easy to do, and for the face recovery time is minimal. I haven't even seen much bruising. For patients that are not quite ready for a lift or that want to avoid dermal filler injections, direct contouring of the melolabial fold or jowl is a great option.

Do you have any treatment advice for physicians?

**Dr. Yeo** – Put your free hand over the advancing tip and feel the depth during treatment. Stretch the skin with that same hand to maintain consistent depth. Don't discharge the laser near the incision opening.

**Dr. Holcomb** – As with any device that emits light you need to carefully monitor how much energy is delivered to each treatment area. It is important to keep the fiber moving while treating to avoid excessive focal tissue heating and keep the fiber parallel to the skin. Avoid pointing the tip of the fiber toward the skin.

**Dr. Man** – I think the vertical bed will become very important, because for something like liposuction it is essential to note, during treatment, the effect of gravity on the tissue you're treating. As aesthetic physicians we rely on our observations, so the vertical bed is very helpful. Patients do not spend their day lying down, after all.

Do you have any other thoughts on AccuSculpt that you would like to share?

**Dr. Man** – Incorporated with expectations management, is the importance of diet and exercise. It makes no sense to put on weight afterward. Managing weight is so important to me that I waive my surgeon's fee for those patients who weigh less than when I last performed the procedure on them.

**Dr. Hankins** – AccuSculpt does not reduce the need to be thorough and careful when performing liposuction procedures, and it doesn't make up for lazy mistakes. It does however, enhance the ability to use the smaller cannula and that, plus the tightening, can help avoid some of the problems with loose skin and contour irregularities we've seen in the past. It is a gentler procedure as well. I'm excited about this technology.

**Dr. Holcomb** – This laser is not some copy of an existing technology. This is a novel treatment wavelength based on sound science. If you look at the absorption curves for adipocyte and tissue water, you would pick the 1444 nm wavelength over others. AccuSculpt is inherently safer and more efficient because you use less energy. It will be interesting to see what other applications this wavelength may be useful for.

**Dr. Yeo** – Perhaps in the future, AccuSculpt could be used for correcting port-wine stain soft tissue hypertrophy, or for dermal remodeling by gently irradiating the undersurface of the skin.