



# Caution Cellulite: Bumpy Road Ahead

A Special Report by Paula Begoun

# Cellulite is a complicated and controversial topic with no agreement among researchers as to exactly what it is physiologically or which treatments, if any, can have a positive effect.

The only two things about cellulite everyone agrees on are what it looks like and that if you have it, you hate it and you want to get rid of it.

Regrettably, most of us (women that is) have it to one degree or another. According to statistics, and this is really shocking, cellulite shows up on the thighs of more than 85% of females past the age of eighteen regardless of ancestry, although it is more common for Caucasian and Asian women. To make matters worse, for women, cellulite represents stored, hard to metabolize fat that is interdependent on estrogen. Ironically, weight isn't part of the problem. Rather, any amount of fat (and we all need some of it in our bodies) can show up as cellulite on women's thighs. (Source: *Cosmetics & Toiletries* magazine, October 2004, page 49)

Despite being a completely benign condition, much like wrinkles, cellulite is a major beauty concern of women worldwide with corresponding myths and deceptions taking the place of fact and reason. This means the cosmetics industry and lots of doctors and estheticians want to sell you products or provide treatments (particularly expensive ones) claiming to slim, trim, tone, and de-bump your thighs. Everything from loofahs, miracle ingredients, special washcloths, herbal supplements, vitamins, minerals, bath liquids, rubberized pants, brushes, rollers, body wraps, and toning lotions to electrical muscle stimulation, vibrating machines, inflatable hip-high pressurized boots, hormone or enzyme injections, and massage have been claimed to be successful cellulite treatments. Yet, as the anti-cellulite market increases, research regarding efficacy remains at a bare minimum and is often obscured by self-serving studies from those who peddle these cures. Sadly, the lure of these supposed remedies is hard to fend off because fighting cellulite is an uphill battle. For lots of women the mere hope or illusion that something may work is a powerful temptation, and that weakness is something the cosmetics industry counts on and exploits to the max. (Source: *Journal of Cosmetic Science*, November 2005, pages 379-393)

## Myth Busting

"Trying to navigate and smooth out cellulite fact from fiction isn't easy but there is a small amount of good news: there are options that may make a difference. The bad news, is that even the treatments that have some potential of working (and I say potential of working very carefully) rarely live up to the claims asserted, but improvement as opposed to merely wasting

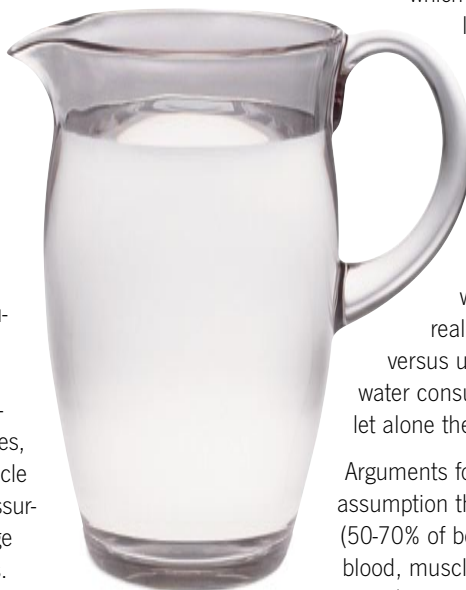
your money is definitely a turn for the better. A great way to start is to straighten out some popular myths about cellulite."

**Men don't get cellulite:** To some extent that's true. Physiologically, women are far more prone to accumulating fat on the thighs and hips while men gain weight in the abdominal area. Plus, for women, the connective tissue beneath the skin has more stretch and is vulnerable to disruption, which is the perfect environment for developing cellulite. Some men do get cellulite—just statistically not as much as women. (Source: *Journal of Cosmetic Science*, March-April 2005, pages 105-120)

**Drinking water helps:** If water could change skin structure and reduce fat I assure you no one would have cellulite, or would be overweight for that matter. Drinking water probably is beneficial (although there is really no research showing how much is healthy versus unhealthy) but there is no research showing water consumption will impact fat anywhere on your body, let alone the dimples on your thighs.

Arguments for high water intake are generally based on the assumption that because our bodies consist mostly of water (50-70% of body weight, about forty-two liters) and our blood, muscles, brain, and bones are made up mainly of water (85%, 80%, 75%, and 25%, respectively), we therefore need at least eight 8-ounce glasses of water each day. But assumptions aren't science and this one is a non-sequitur; it is similar to arguing that since our cars run on gasoline, they always need a full tank to run efficiently. (Source: *American Journal of Physiology—Regulatory, Integrative, and Comparative Physiology*, November 2002, pages 993-1004)

**Water retention causes cellulite:** It's ironic that low water intake is considered a possible cause of cellulite, and the polar opposite—retaining too much water—is thought to be a factor as well. There is lots of speculation of how water retention can affect cellulite but there is no actual research supporting this notion. Further, fat cells actually contain only about 10% water, so claiming to eliminate excess water won't make a difference and any measurable result would be transient at best. It is true that water retention can make you look bloated and feel like you've gained weight,





but water itself doesn't impact fat or the appearance of cellulite. (Source: *Journal of Strength and Conditioning Research*, November 2003, pages 817-821)

**Eating a specialized diet can help:** A healthy diet that encourages weight loss may help your entire body look better. However, because weight in and of itself is not a cause of cellulite, dieting won't change the skin structure of your thighs, which causes the dimpled contours to show. For some people cellulite is made worse by the accumulation of extra fat. In those cases, weight reduction may decrease the total area and depth of cellulite. (Source: *Clinical Dermatology*, July-August 2004, pages 303-309)

**Cellulite is different from fat on the rest of the body:** Theories abound about how cellulite differs from regular body fat. However, few studies show how cellulite clumps differently than other fat on your body. But overall, most researchers feel cellulite is just fat, plain and simple. Besides, even if cellulite is different in how it congregates, what you can and can't do about fat on any part of the body remains the same. (Source: <http://www.quackwatch.org/01QuackeryRelatedTopics/cellulite.html>)

**Exercise can help:** Exercise helps almost every system in the human body, but it won't necessarily impact the appearance of cellulite. Exercise doesn't improve skin structure and it can't affect localized areas of fat. In other words, you can't spot reduce fat accumulation in a specific area. (Source: *British Journal of Plastic Surgery*, April 2004, pages 222-227)

**Detoxifying the body reduces the appearance of cellulite:** Detoxifying the body for consumers has taken on the meaning of purging it of pollutants or any other problem substances in the environment or in the foods we eat. In terms of the way this concept has been mass marketed, there is little research showing credible efficacy as to whether or not detoxification of the body is even possible. However, "detoxifying" the body as it is used in the scientific community describes the process of reducing cellular damage primarily by antioxidants or enzymes that prevent certain abnormal or undesirable cell functions from taking place. There is no doubt this is helpful for the body. Whether or not this reduces cellulite is completely unknown because skin structure and fat accumulation are not caused by toxins in the environment. Furthermore, there are no studies showing toxins of any kind prevent fat from being broken down. (Sources: *Journal of Endotoxin Research*, April 2005, pages 69-84 and *Journal of Biochemistry and Molecular Biology*, May 2003, pages 258-264)

## What We Do Know

**There are three leading theories about cellulite formation:**

**1.** Women have unique skin structure on their thighs, which causes cellulite to easily form. **2.** The connective tissue layers on the thigh are too weak or thin to maintain a smooth appearance—allowing fat contour to show through. **3.** Vascular changes and possible inflammatory conditions may be to blame. (Source: *Journal of Cosmetic Laser Therapy*, December 2004, pages 181-185; *Journal of Applied Physiology*, April 2002, pages 1611-1618; and *Skin Research and Technology*, May 2, 2002, pages 118-124.)

Most cellulite products come in the form of lotions and creams with a vast array of either exotic-sounding or lab-synthesized ingredients. Beyond topical products there are devices such as endermologie and microdermabrasion, medical treatments such as lasers and mesotherapy (a procedure involving repeated injections, which is claimed to break down fat).

## Lotions, Creams, and Extracts Galore

As far as skin-care products for the body are concerned, the litany of options is mesmerizing. Yet there is almost no uniformity between formulas. It would appear, if the claims are to be believed, a wide variety of unrelated plant extracts can deflate or break down fat and/or restructure skin. Looking at the research, however, most articles suggest there is little hope that anything rubbed on the skin can change fat deposits or radically improve the appearance of cellulite.

The hope that botanicals have the answer is odd because not one study points to what concentration of an ingredient needs to be in a formulation, what physiochemical characteristics particular to each active ingredient need to be present, or whether or not these ingredients retain any standardized properties between batches. (Sources: *Dermatologic Surgery*, July 2005, pages 866-872 and *The European Journal of Dermatology*, December 2000, pages 596-603)

All of the following products (and lots more) are claimed to reduce or fight the appearance of cellulite:

**Avon Cellu-Sculpt Anti-Cellulite Slimming Treatment** (\$16 for 6.7 ounces) contains caffeine, *Ginkgo biloba* leaf extract, *Bupleurum falcatum* extract, *Lagerstroemia indica* extract, carnitine, *Panax ginseng* root extract, *Malva sylvestris* extract, Inulin, xymenynic acid, palmitoyl pentapeptide-3 as the blend of ingredients aimed at fighting cellulite.



**Biotherm Celluli-Choc Dimpled Skin Smoothing Gel Skin-Enhancer** (\$46 for 6.76 ounces) is mostly water and alcohol along with caffeine, *Cola nitida* seed extract, *Ginkgo biloba* leaf extract, and miniscule amounts of *Terminalia sericea* extract, *Vitreoscilla* ferment, *Theobroma cacao* extract, and *Panax ginseng* root extract.

**Bliss Labs High Thighs Cellulite-Fighting Serum** (\$35 for 8.2 ounces) contains hydrolyzed *Ulva lactuca* extract, *Terminalia sericea* extract, *Visnaga vera* extract, *Plectranthus barbatus* extract, *Porphyridium cruentum* extract, and retinyl palmitate along with a long list of irritating plant extracts

(including menthol and eucalyptus oil) to fight your cellulite.

**Clarins Total Body Lift Stubborn Cellulite Control** (\$57 for 7 ounces) is mostly water, alcohol, and silicones along with some acrylates and slip agents. It also contains menthol (a skin irritant) so you think it's doing something on your skin. It does contain caffeine, *Atractylodes lancea* root extract, *Baccharis genistelloides* extract, *Uncaria tomentosa* extract, *Hortonia floribunda* leaf extract, *Geranium robertianum* extract, and *Agrimonia eupatoria* leaf extract as the ingredients that are supposed to help reduce stubborn cellulite. The amounts of these are miniscule so their ability to impact skin in any way is remote at best.

**Estee Lauder Body Performance Slim Shape Anti-Cellulite/Anti-Fluid Advanced Visible Contouring Serum** (\$52.50 for 6.7 ounces) contains mostly water, alcohol, silicones, thickening agents, and lots and lots of plant extracts in the hope they will work on your cellulite. Several interesting antioxidants, ingredients that mimic skin structure, and some cell communicating ingredients fill out the list, which could have made it a very good moisturizer for dry skin. But with alcohol as the second ingredient and menthol on the list that's unlikely to be the case. Some of the exotic offerings meant to convince you they can reduce cellulite are St. Paul's wort extract, acetyl carnitine HCl, *Santalum album* seed extract, retinyl palmitate, caffeine, creatine, adenosine phosphate, *Coleus barbatus* extract, *Paullinia cupana* seed extract, palmitoyl tetrapeptide-3, and hesperidin methyl chalcone. The notion that these ingredients will alter cellulite is wishful thinking.

**L'Oreal Dermo-Expertise Sublime Slim Day Anti-Cellulite** (\$13.95 for 6.7 ounces) is mostly alcohol, water, and a lot of fragrance with caffeine, escin, disodium rutinyl disulfate, *Ginkgo biloba* leaf extract, carnitine, *Pisum sativum*, and Coenzyme A as the ingredients meant to impact your cellulite.

**Murad Firm and Tone Serum** (\$65 for 6.75 ounces) contains a "who's who" of both skin-beneficial and skin-detrimental ingredients. Firm and Tone Serum claims to minimize body imperfections ranging from cellulite



to stretch marks and sagging skin, leaving you "proud to show off." I wouldn't bank on this water- and alcohol-based concoction for any amount of body perfection—especially when you consider the amount of irritation your skin will experience from the peppermint, menthol, and several fragrant, volatile oils that have no established benefit for skin. Last but not least, this product also contains esculin, a component of horse chestnut, which is considered toxic and is not recommended for topical application by some experts. (Source: *Ellenhorn's Medical Toxicology: Diagnoses and Treatment of Human Poisoning, 2nd Edition*. Baltimore, MD: Williams & Wilkins, 1997)

**Neutrogena Anti-Cellulite Treatment, Retinol Formula** (\$19.99 for 5 ounces) contains less alcohol than most, but there is still enough to warrant caution. Other than that, it contains caffeine, *Fucus vesiculosus* extract, and retinol as the active ingredients meant to deal with your cellulite.

**N.V. Perricone M.D. Cosmeceuticals Alpha Lipoic Acid Body Toning Lotion SPF 15** (\$75 for 6 ounces) should be avoided because this SPF 15 sunscreen doesn't contain the UVA protecting ingredient of titanium dioxide, zinc oxide, or avobenzone. If a company can't figure out how to protect your skin from sun damage, how can you trust them to reduce the appearance of cellulite on your thighs? Nonetheless, this overly aromatic product containing several problematic fragrant plant oils is just a moisturizer with a few good water-binding ingredients and antioxidants. There is no research showing any of these ingredients combat cellulite.

**Osmotic Lipoduction Body Perfecting Complex** (\$175 for 6.8 ounces). This is one of the most expensive anti-cellulite treatments I've found. And considering the steep price, you'd think investing in it would net the positive results this product's makers assert it delivers. Alas, this isn't true as there is nothing in this "complex" that will even slightly alter the dimpled appearance of cellulite. This product contains mostly water and alcohol along with caffeine, *Bupleurum falcatum* extract, soy phospholipids, and Forskohli root extract (see *Plectranthus barbatus* extract on page 6). This also includes spearmint oil to make the skin tingle so you think the product is doing something. Even if you're still curious, this simple formulation isn't as interesting and contains many of the same ingredients as Avon's Cellu-Sculpt previously reviewed.

**Remede Slender Active Amplifier** (\$55 for 4.2 ounces) is a mostly water- and alcohol-based moisturizer, which in and of itself, makes it a bit of an oxymoron. It also includes decyloxazolidinone, *Terminalia sericea* extract, *Visnaga vera* extract, *Plectranthus barbatus* extract, and *Aurantium amara* along with several fragrant plant extracts that are particularly irritating or sensitizing for skin.

**Sisley Paris Phyto Sculptural Anti-Cellulite** (\$141 for 5.2 ounces) contains mostly water, citrus extract, plant oil, thickeners, *Ruscus aculeatus* root extract, grape leaf extract, horse chestnut extract, and *Crataegus monogina* flower extract as the "active" extracts that are supposed to impact cellulite. There is nothing in this intensely fragranced product that will change a dimple anywhere on your body. The only thing anti-cellulite about this product is the name.



**The potential effectiveness of some of the ingredients contained in the previously-mentioned products is reviewed in the upcoming pages.**

## A Bevy of Anti-Cellulite Ingredients

### **Agrimonia eupatoria leaf extract**

Research shows this plant extract inhibits the hepatitis b virus and has antioxidant properties. Whether or not it has a benefit when applied topically is not known. There is no research showing it to be effective for cellulite. (Sources: *Phytotherapy Research*, April 2005, pages 355-358 and *Journal of Ethnopharmacology*, January 2005, pages 145-150)

### **Aminophylline**

This pharmaceutical ingredient is found in prescription bronchodilators—medications designed to open blocked air passageways in lungs—and also is found in some cellulite lotions and creams. Aminophylline gained notoriety as an ingredient in cellulite creams as a result of a study published in *Obesity Research* (November 1995, Supplemental pages 561S–568S). However, the validity of this research was called into question because one of its authors was marketing an aminophylline cream being sold at the time, and thus was not considered an objective investigator. Also, the number of participants in the study was small, and most also were dieting and exercising at the same time they were applying the aminophylline cream. (Source: *Annals of Pharmacotherapy*, March 1996, pages 292–293)



Doubt about aminophylline's value also was revealed in research published in *Plastic and Reconstructive Surgery* (September 1999, pages 1110–1114), which described a double-blind study that compared the effectiveness of three different treatments for cellulite on three separate groups of women. One investigated the twice-daily application of aminophylline cream compared with a placebo; another the twice-weekly treatment using endermologie (a machine rolled over the skin's surface, which has been claimed to get rid of cellulite) on one leg and nothing on the other; and a third combining endermologie on both legs with the same cream regimen used by the first group. "No statistical difference existed in measurements between legs for any of the treatment groups... [Even] The best subjective assessment, by the patients themselves, revealed that only 3 of 35 aminophylline-treated legs and 10 of 35 [e]ndermologie-treated legs [felt] their cellulite appearance improved." There is no other research showing this to be helpful and the risk of absorption and bronchial involvement when applied topically remains unclear.

### **Atractylodes lancea root extract**

Also known as Chinese Thistle Daisy, this root extract is used in Chinese and Japanese alternative medicine for angiogenesis (the formation of new blood vessels) in type-2 diabetes because it contains beta-eudesmol. Some of its other components have been shown to have anti-inflammatory properties as well. Whether or not this can be of benefit when the entire extract is applied topically is unknown. (Sources: *Yajugaku Zasshi, The Pharmaceutical Society of Japan*, March 2006, pages 133-143; *European Journal of Pharmacology*, April 2005, pages 105-115; and *Planta Medica*, July 2001, pages 437-442)



### **Bupleurum falcatum extract**

A plant used in Chinese medicine for a variety of ailments ranging from the common cold to liver problems. Some research has shown this extract to have anti-tumor, anti-inflammatory, and antioxidant properties. Whether or not these benefits can be delivered to skin in a lotion or cream is unknown. (Sources: [www.naturaldatabase.com](http://www.naturaldatabase.com); *British Journal of Pharmacology*, December 2000, pages 1285-1293; *Planta Medica*, June 1998, pages 404-407; and *Life Sciences*, August 1998, pages 1147-1156)

### **Caffeine**

Since 1971 when the first Starbucks opened in my hometown of Seattle, I have been a coffee lover. And over the years I've developed a passion for Grande and Venti Lattes. I would be thrilled to learn that this has somehow helped my thighs, but alas, this is far from the case. Separate from my own anecdotal experience, caffeine is one of the more typical ingredients to show up in cellulite creams and lotions. There are two reasons for this. The first is caffeine's distant relationship to aminophylline. Aminophylline is a modified form of theophylline (Source: *Yale New Haven Health Library, Alternative/Complimentary Medicine*, [www.yalenewhavenhealth.org](http://www.yalenewhavenhealth.org)), and caffeine contains theophylline (Source: *Progress in Neurobiology*, December 2002, pages 377–392). There is no research to prove or disprove that theophylline can affect cellulite. However, researchers have disproved aminophylline's impact on cellulite. The second reason caffeine may show up in cellulite products stems from research showing it to have benefit for weight loss. But that's only when you drink it, not when you rub it on your thighs.

There are only two studies showing caffeine to have benefit for reducing cellulite. One was conducted by Johnson & Johnson, which owns the RoC and Neutrogena brands, both of which sell cellulite creams that contain caffeine. The other was conducted by cosmetics ingredients manufacturers that sell anti-cellulite compounds (Source: *Journal of Cosmetic Science*, July-August 2002, pages 209–218). There is no other independent research showing caffeine provides any benefit for treating cellulite.

Caffeine does have potential as an antioxidant, so it isn't a wasted ingredient in skin-care products. It's just not one that can reduce the appearance of cellulite. (Sources: *BMC Complementary and Alternative Medicine*, March 2006, <http://www.biomedcentral.com/1472-6882/6/9>; *Bioscience, Biotechnology, and Biochemistry*, November, 2005, pages 2219-2223; *Obesity Research*, July 2005, pages 1195-1204; and *Sports Medicine*, November 2001, pages 785-807)

## Carnitine

A naturally occurring amino acid, deficiencies of this small but essential component can result in muscle loss and a multitude of other problems. Research abounds for carnitine, especially acetyl-L-carnitine, which is considered to have more bioavailability in terms of its effect on aging and brain function. How this amino acid affects skin when applied topically is unknown.

## Coleus barbatus extract

See *Plectranthus barbatus* extract reviewed on page 6.

## Disodium rutinyl disulfate

No research shows this antioxidant as having any impact on cellulite.

## Escin

Derived from horse chestnut (*Aesculus hippocastanum*), this ingredient has been prescribed as an oral supplement to reduce some symptoms of chronic vein insufficiency, such as varicose veins, pain, tiredness, tension, swelling in the legs, itching, and edema. However, because horse chestnut contains significant amounts of the toxin esculin, it can be lethal and other experts recommend not using it. When applied topically, however, there is research showing that a gel containing 2% escin can improve circulation. Results from another study showed a reduction in inflammation in sport-injury when escin was combined with heparin (a mucopolysaccharide used as an anti-clotting medication), and a form of salicylic acid (diethylammonium salicylate). Escin is also a potent antioxidant. As a skin-care ingredient escin clearly has a place, but as for improving cellulite that's another story. While it may seem logical that blood flow and cellulite are related the research just isn't there to support the notion, or your thighs. Plus, cellulite products contain far less of this ingredient than the amount used in the studies. (Sources: *British Journal of Sports Medicine*, 36 June 2002, pages 183-188; *Angiology*, March 2000, pages 197-205; [www.naturaldatabase.com](http://www.naturaldatabase.com); *Archives of Dermatology*, November 1998, pages 1356-1360; and *International Journal of Cosmetic Science*, December 1999, page 437)

## Exfoliants

Some cellulite creams have included glycolic or lactic acid (AHAs) or scrubs in an effort to somehow exfoliate away bumpy skin texture on the thighs. Theoretically, AHAs come the closest to having the potential for reducing the appearance of cellulite. If cellulite is a problem with skin structure, applying ingredients that help to improve it, should make a difference. There are a number of studies demonstrating the effectiveness of AHAs for stimulating collagen synthesis and improving the overall structure of skin. What is important to recognize is that if AHAs can help, you don't need something labeled as a "cellulite cream." Any well-formulated AHA gel, lotion, or cream will work. (Sources: *Journal of Dermatology*, January 2006, pages 16-22; *Plastic and Reconstructive Surgery*, April 2005, pages 1156-1162; *Experimental Dermatology*, December 2003, pages 57-63; and *American Journal of Clinical Dermatology*, November-December 2000, pages 369-374)

In terms of scrubs, there is absolutely no research showing these have any impact on cellulite.

## Ginkgo biloba leaf extract

Research shows this potent antioxidant helps improve blood flow. Whether or not blood flow changes anything about cellulite is unknown.

(Sources: *Medical Hypotheses*, March 2006, pages 1152-1156; *Journal of Burn Care and Rehabilitation*, November-December 2005, pages 515-524; and *Journal of Pharmaceutical and Biomedical Analysis*, February 2005, pages 287-295; and *Planta Medica*, November 2004, pages 1052-1057)

## Hesperidin

Is a flavonoid found in various plants such as citruses and evening primrose oil. It has potential as a potent antioxidant—reducing the effects of sun damage and in the prevention of some cancers. It is also taken orally to improve circulation and to strengthen capillaries. There is no published research showing it combats cellulite. (Sources: *Photochemistry and Photobiology*, September 2003, pages 256-261; *Phytotherapy Research*, December 2001, pages 655-669; and *Anticancer Research*, July-August 1999, pages 3237-3241)

## Hortonia floribunda leaf extract

No research shows this plant as having any benefit for skin although it is used as a mosquito repellent in Sri Lanka.

## Lagerstroemia indica extract

Also known as Crepe Myrtle, there is no published research showing it to be effective for the skin in general.

## Malva sylvestris extract

Also known as Blue Mallow Flower, this extract may have some anti-inflammatory and soothing properties for the skin, as well as some potential antioxidant benefits. (Sources: [www.naturaldatebase.com](http://www.naturaldatebase.com), *International Journal of Food Sciences and Nutrition*, February 2004, pages 67-74 and *Journal of Ethnopharmacology*, January 2004, pages 135-143)

## Panax ginseng root extract

This root extract may have potent antioxidant properties (potentially anti-cancer) and may promote wound healing. Whether or not it can have an impact on cellulite is unknown. (Sources: *Journal of Agricultural and Food Chemistry*, April 2006, pages 2558-2562; *Phytotherapy Research*, January 2005, pages 65-71; *Archives of Pharmacal Research*, February 2002, pages 71-76 and *Cancer Letters*, March 2000, pages 41-48)

## Paullinia cupana seed extract

Also called guarana, it is used primarily in herbal supplements and beverages as a stimulant. In animal studies using mice, it has been shown to affect fat metabolism. There is also research showing that repeated use of guarana can result in persistent increases in heart rate and blood pressure as well as unfavorable actions on glucose and potassium homeostasis. Such effects could be detrimental in persons with hypertension, atherosclerosis, or glucose intolerance—conditions that are strongly associated with obesity. Guarana is sometimes used in cellulite products because of its theophylline and caffeine components. Research has shown it can be absorbed into the skin. Whether or not topical application can affect fat metabolism or have other associated health risks in humans is not known. (Sources: *International Journal of Pharmaceutics*, April 2006, [www.sciencenews.org](http://www.sciencenews.org))



Ginkgo biloba leaf

cedirect.com/; *Food and Chemical Toxicology*, June 2006, Pages 862-867; *Clinical Nutrition*, December 20005, pages 1019-1028; and *Clinical Pharmacology & Therapeutics*, June 2005, pages 560-571)

### **Pisum sativum**

The Latin name for the garden pea, and while it does have antioxidant activity there is no research showing if it can reduce cellulite. (Source: *Phytotherapy Research*, October 2003, pages 987-1000)

### **Plectranthus barbatus extract**

Also known as Forskolin or *Coleus barbatus* there is information showing this herb to have cardiovascular and bronchial benefits. There is a small amount of research demonstrating Forskolin can stimulate lipolysis in these cells and also inhibits glucose uptake by fat cells when taken as a supplement. However, there is no information showing this effect on fat cells when applied topically. (Sources: [www.naturaldatabase.com](http://www.naturaldatabase.com) and *Memorial Sloan Kettering Cancer Center, About Herbs*, <http://www.mskcc.org/mskcc/html/11570.cfm>)

### **Porphyridium cruentum extract**

This extract is derived from a type of red algae. There is research showing components of red algae contain the omega-3 fatty acid eicosapentaenoic, the omega-6 fatty acid arachidonic acid, and other skin-friendly ingredients such as polysaccharides. Whether or not the entire red algae extract provides benefit on skin is not known. (Sources: *Bioseparation*, September 2000, pages 299-306 and *Free Radical Biology and Medicine*, February 1996, pages 241-249)

### **Retinol**

If the layers of connective tissue beneath the skin on the thighs are indeed the main cause of cellulite (along with excess or poorly formed fat deposits) then improving skin structure should, theoretically, make a difference. There is growing evidence proving this to be the case. Retinol (the entire vitamin A molecule) is one of the ingredients known to help improve skin structure. Of all the ingredients to look for in a cellulite product this should be at the top of the list. However, most cellulite products contain teeny amounts of retinol (at best) and are often in packaging that won't keep this air-sensitive ingredient stable. One other point: Johnson & Johnson has a study showing the combination of retinol, caffeine, and ruscogenine can reduce the appearance of cellulite. Of course J&J-owned companies RoC and Neutrogena both sell cellulite products with that combination of ingredients. (Sources: *Journal of Cosmetic Science*, July-August 2001, pages 199-210; *Journal of the European Academy of Dermatology & Venereology*, July 2000, page 251; *American Journal of Clinical Dermatology*, November-December 2000, pages 369-374)

### **Ruscogenine**

An extract from the plant butcher's broom, some research has shown it to be effective when taken orally for improving the function of veins and capillaries. Whether or not it has benefit topically for cellulite isn't supported by independent research. (Sources: [www.naturaldatabase.com](http://www.naturaldatabase.com); and *Journal of Alternative and Complementary Medicine*, June 2000, pages 539-549)

### **Santalum album seed extract**

Is the Latin name for sandalwood extract and is used in cosmetics as a fragrance. It can have antioxidant properties and there is research showing it minimizes herpes breakouts. It also can be a skin irritant or sensitizer. (Sources: *Journal of Ethnopharmacology*, July 2000, Pages 23-43 and *European Journal of Cancer Prevention*, August 1997, pages 399-401)

### **Terminalia sericea extract**

This extract has anti-inflammatory and antibacterial properties, but there is no research showing it to have any effect on the appearance of cellulite. (Sources: *Journal of Ethnopharmacology*, February 2005, pages 43-47 and *European Journal of Pharmaceutics and Biopharmaceutics*, March 2003, Pages 191-198)

### **Ulva lactuca extract**

An extract from the plant known as sea lettuce, it has some anti-inflammatory and antioxidant properties for skin (Source: *Phytotherapy Research*, December 2000, pages 641-643). However, there is no research showing it to have any benefit for cellulite reduction.

### **Uncaria tomentosa extract**

Also known as Cat's Claw, there is some research showing it to be an effective anti-inflammatory and antioxidant. There is also some evidence it may have cardiovascular effects by dilating peripheral blood vessels. It may also kill cancer cells without affecting normal cells (Source: [www.naturaldatabase.com](http://www.naturaldatabase.com) and *Journal of Ethnopharmacology*, 2000, pages 115-126). Conversely, there is research showing it may increase the viability of some cancer cells. (Source: *Pediatric Blood and Cancer*, January 2006, pages 94-98). Research showing it to have antioxidant or DNA-repairing benefits when applied topically has been presented by the Lauder Corporation. (Source: *Phytotherapy Research*, March 2006, pages 178-183)

### **Visnaga vera extract**

Also known as khella, when taken orally there is concern that it may cause nausea, dizziness, constipation, headache, itching, and insomnia. Khella may cause liver problems for some people. There is also some concern that it might cause photosensitivity because it contains khellin and furocoumarin. (Source: [www.naturaldatabase.com](http://www.naturaldatabase.com))



## **Mesotherapy**

Mesotherapy is a procedure, which has been claimed to dissolve fat from the repeated injection (and I mean lots and lots of injections) of various substances into the fat layers of skin. Mesotherapy actually got its start 50 years ago in France through the work of a physician who was trying to find a cure for deafness (Source: *Dermatological Times*, December 1, 2004). From there it gained notoriety in the United States after singer Roberta Flack appeared on ABC's *20/20* claiming mesotherapy helped her lose 40 pounds (although she said she also dieted and exercised, what stood out for lots of people was the part that didn't involve diet and exercise).

Some of the substances being injected are homeopathic and some are pharmaceutical. Strangely, there isn't necessarily any consistency, and the cocktail of ingredients can vary from practitioner to practitioner. The fact that the material being injected isn't consistent and not everyone discloses

exactly what they are using makes this treatment very hard to evaluate. The most typically used substance in mesotherapy is phosphatidylcholine, but it can also be combined with deoxycholate. A handful of studies have shown that this can successfully reduce fat when injected into the skin, with one study demonstrating this for the undereye area. Theoretically, the reduction of subcutaneous fat may be caused by inflammatory-mediated cell death and resorption.

However, mesotherapy isn't without risk. One study explained, "Side effects included burning, erythema, and swelling at the injection site. At follow-up averaging 9 months, 50% of patients reported persistence of benefit, 20% experienced some fading, and 30% [received no benefit at all]." It also concluded that "Larger studies evaluating long-term safety and efficacy of phosphatidylcholine for cosmetic purposes are warranted." Another study states, "Until further studies are performed, patients considering mesotherapy for cellulite must be aware that the substances currently being injected to treat this cosmetically disturbing, but medically benign, condition have not been thoroughly evaluated for safety or efficacy."

Finding out if this would work for you isn't inexpensive. Mesotherapy costs \$300-\$500 for each treatment and about ten to fifteen sessions are recommended, so it ends up being more expensive than liposuction. (Sources: *Journal of Cosmetic Laser Therapy*, December 2005, pages 147-154 and March 2005, pages 17-19; *Morbidity and Mortality Weekly Report*, November 2005, pages 1127-1130; *Plastic and Reconstructive Surgery*, July 2003, pages 162-170; and *Aesthetic Plastic Surgery*, July-August 2003, pages 315-318)

## Endermologie

Searching on the Internet, you would think endermologie was nothing less than a cure for cellulite. Physicians, spas, salons, and just about anybody else with the money to buy one of these machines want you to believe in their exaggerated, over-the-top claims. Developed in France in the 1980s, the FDA approved this high-powered, handheld massage tool in 1998. It consists of two motorized rollers with a suction device that is moved over the skin, somewhat like a mix between an old-time, wet-clothes ringer and a vacuum cleaner. (By the way, European women are confounded by cellulite, too, even though they tend not to have the weight problems Americans do. But remember, weight and cellulite are not directly related.)

While claims abound, legally those advertising endermologie treatment are only permitted to promote it for "temporarily improving the appearance of cellulite." Of course, somehow the word "temporarily" never is seen in the ads or Web sites promoting this device. Finding out if this works is time consuming and pricy. Anywhere from ten to twenty treatments are recommended plus one or two maintenance visits per month are required to preserve any results. There is no typical cost, and depending on where you go, prices can range from \$75 to \$200 per session.

Attempting to portray endermologie as a serious effective treatment for cellulite, it is often presented as being FDA-approved as a Class I Medical Device and therefore approved by the FDA for its intended purpose. While endermologie machines are indeed Class I Medical Devices, this has no meaning in terms of efficacy. Class I status is a designation indicating there is "minimal potential for harm to the user." No other aspect of the machine is approved or sanctioned by the FDA. According to the FDA ([www.fda.gov](http://www.fda.gov)), "Class I Medical Devices are subject to the least regulatory control ... Foreign establishments ... are not [even] required to register

their product with the FDA.... Examples of Class I devices include elastic bandages, examination gloves, and hand-held surgical instruments." The FDA attributes no efficacy value to endermologie machines. Whether or not these devices are harmful depends on how they are operated, meaning how aggressively they're used.

Despite the FDA's lack of recognition (and some warning letters admonishing those making false claims) you will often see lists of "studies" claiming to prove endermologie's effectiveness. Yet, some of these "studies" were neither published nor peer-reviewed. Rather, they were lectures presented worldwide at various medical conferences. These types of presentations are not studies. The information presented is one sided, and more often than not, paid for by the company that owns the device with the presenter receiving financial compensation for the endorsement. Such presentations are not held to the same scientific standard as published, peer-reviewed research. What you will certainly not see listed are the published studies indicating that endermologie doesn't work. (Source: *Journal of Cosmetic and Laser Therapy*, December 2004; 181-185, *Plastic Reconstructive Surgery*, September 1999, pages 1110-1114; and *Aesthetic Plastic Surgery*, March 1998, pages 145-153)

Regardless of conflicting evidence, endermologie and similar machines, such as ESC's Silhouette SilkLight Subdermal Tissue Massage System, are here to stay. It is an easy procedure to offer clients and, for the most part, it seems to make women happy. Whether or not this is psychological doesn't seem to matter. In the long run, complications are few and far between, so the only real downside is the potential waste of money, which doesn't stop those in the pursuit of perfection.

## Non-ablative Lasers and Light Systems

Lasers may very well be the next generation in the world of cellulite therapies, but a lot more research is needed before this evolving treatment proves itself to be effective and worth the money. Ever since the FDA approved TriActive Laserdermology (Cynosure Inc, Chelmsford, MA) as a Class II medical device that "temporarily reduces the appearance of cellulite," lots of companies have wanted in on the action. TriActive combines a diode laser (at a wavelength of 810 nanometers) with localized cooling, suction, and mechanical massage (sort of a cross between a laser and an endermologie machine). Treatment protocol varies, but generally the process is three times a week for two weeks and then biweekly treatments for five weeks. A Class II medical device status indicates this laser can be sold and used without physician supervision, which means a growing number of salons and spas are advertising its success and changing the FDA classification of "temporarily reduces" to a more alluring "reduces" cellulite. (Sources: <http://www.fda.gov/cdrh/pdf3/k030876.pdf>; Securities and Exchange Commission Information, <http://www.secinfo.com/dsvRx.z4y6.htm>; and *Journal of Cosmetic and Laser Therapy*, June 2005, pages 81-85 and June 2004, pages 181-185)

Another device approved by the FDA is the VelaSmooth system (Syneron Inc, Richmond Hill, Ontario, Canada). It combines near infrared light at a wavelength of 700 nanometers, continuous wave radiofrequency, and mechanical suction. Twice-weekly treatments for a total of eight to ten sessions have been recommended. One of the only studies demonstrating this machine's efficacy included twenty women, and eighteen of the twenty personally thought they saw improvement. Yet the actual measurements only showed a 0.3-inch reduction in thigh circumference. Hardly sweeping results by any standard, making it clear that larger-scale studies are needed, especially before you decide to spend \$1,000 or more to see

if these kind of machines can get you what you want, namely smoother thighs, not a lighter wallet. (Sources: *Journal of Cosmetic and Laser Therapy*, December 2004, pages 187-190; December 2004, pages 181-185; June 2005, pages 81-85)

## Electrical Muscle Stimulators (EMS) and Iontophoresis Devices

According to [www.quackwatch.com](http://www.quackwatch.com), "Muscle stimulators are a legitimate medical device approved for certain conditions—to relax muscle spasms, increase blood circulation, prevent blood clots, and rehabilitate muscle function after a stroke. But many health spas and figure salons claim that muscle stimulators can remove wrinkles, perform face lifts, reduce breast size, reduce a 'beer belly,' and remove cellulite. Iontophoresis devices are prescription devices that use direct electric current to introduce ions of soluble salts (i.e., medications) into body tissues for therapeutic or diagnostic purposes. The FDA considers promotion of muscle stimulators or iontophoresis devices for any type of body shaping or contouring to be fraudulent." (Source: [http://www.fda.gov/ora/fiars/ora\\_import\\_ia8901.html](http://www.fda.gov/ora/fiars/ora_import_ia8901.html))

## Body Wrapping

Many salons and spas offer a cellulite/weight-loss service where the body is tightly wrapped or dressed in special garments with or without a "specialty" cream or lotion applied first. Promising to take inches off your body, the cost for these treatments range from \$65 to \$500 depending on the salon and if the clientele is elite enough to warrant the steep price. Scientific-sounding information makes this process seem legitimate, but in the long run all it is doing is temporarily compressing your skin (you could probably do this yourself with plastic wrap), which will then return to its original shape in a matter of time, how much time depends on your skin's response. Impressive results often are delivered after measuring several parts of the body and adding up small incremental changes, which in total, end up sounding far more impressive than it really is.

Infomercials, Internet sites, and some multilevel marketing companies sell at-home systems claiming to eliminate toxins and squeeze water-logged fatty tissue dry. You can't squeeze toxins out of a cell. While you may be able to squeeze water out of a cell that same pressure would concurrently injure other cells, which isn't good for your skin. Plus, the water content

would return to whatever level is natural for the body fairly soon due to homeostasis. All in all, there is no research whatsoever showing that body wrapping does anything positive and it will not get rid of fat or cellulite. (Source: *Federal Trade Commission*, [www.ftc.gov/opa/2004/12/transdermal.htm](http://www.ftc.gov/opa/2004/12/transdermal.htm))

## Skin Patches

According to the Federal Trade Commission (FTC), it "...has continued its attack on bogus weight-loss claims by suing a diet patch manufacturer and a retailer that marketed the patch directly to Spanish-speaking consumers. In two separate federal court actions, the FTC charged that the patch manufacturer, Transdermal Products International Marketing Corporation, and the retailer, SG Institute of Health & Education, Inc., falsely claimed that the skin patch causes substantial weight loss. The FTC complaints in both cases also challenged false claims that the patch or its main ingredient, sea kelp, has been approved by the Food and Drug Administration (FDA). The FTC further alleged that Transdermal Products provided retailers with deceptive marketing materials that could be used to mislead consumers."

"The defendants in both cases allegedly used one or more of the seven bogus weight-loss claims that are part of the FTC's 'Red Flag' education campaign announced in December 2003. The ongoing Red Flag campaign provides guidance to assist media outlets and others in spotting false claims in weight-loss ads. According to the FTC, one of the most common false weight-loss claims is that diet patches, topical creams and gels, body wraps, and other products worn on the body or rubbed into the skin can cause substantial weight loss. (Source: Federal Trade Commission, [www.ftc.gov/opa/2004/12/transdermal.htm](http://www.ftc.gov/opa/2004/12/transdermal.htm))

## Liposuction

Liposuction has been used to reshape and reduce the appearance of accumulated fat layers and cellulite. However, the primary function of this procedure is to remove fat in localized areas, not cellulite. In cases where liposuction involves the removal of large quantities of stored fat, it can sometimes worsen the appearance of cellulite by creating unsupported and slackened skin, which will allow any remaining fat (and some always remains) to show through.



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