

AESTHETICA



Reveal your inner beauty

**Laser Surgery Center
Cosmetic and Plastic Surgery
Cosmetics and Skin Care**

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About your surgery

Skin Resurfacing

The Coherent Ultrapulse® 5000C laser system, which is a CO₂ laser, has characteristics which make it optimal for the treatment of cutaneous wrinkles, for use in laser peels (resurfacing) and also for some surgical applications. It is the best laser available for the treatment of wrinkles, various pigmented and non-pigmented skin lesions, actinic (sun) damage and pigmentation abnormalities. This particular laser offers the advantages of gentle, even treatment with the power needed to ablate rather than burn tissue thereby minimizing the healing time. The precision and predictability of the laser essentially makes deep chemical peels and dermabrasion obsolete.

This particular type of laser (CO₂), has been available for over 20 years. It is, basically, the type of laser that has been used for many years for the ablation of warts and superficial skin lesions. It's light is absorbed by the water in the skin and the energy of the light is imparted to that water. The advent of pulsing technology (the ability to produce very high energy, rapid bursts of laser light) allow the ablation of tissue rather than its burning. The water in the cells of the skin heats so rapidly

that the tissue actually explodes without burning. This produces much less heat damage and a much shorter recuperation time than previous laser treatments. The second innovation, that of the *computerized pattern generator (CPG)* allows for the extremely even application of this light to large areas of the skin in patterns chosen by Dr. Caputy with completely controlled shape, energy and overlap of laser pulses. This delivery device, even more than the laser as a whole, is what allows for the extremely even resurfacing of the skin in the treatment of acne scars and wrinkles. It is a definite advance over the 3 mm handpiece that Dr. Caputy used with laser prototypes in Europe and was one of only 30 available worldwide when Dr. Caputy began using it. The experience of the laser surgeon remains the most important factor in an optimal result, but the technology aids this greatly.

Two important things occur when the laser light energy is applied to the skin. The first, is that the water (which is within the cells of the superficial layers of skin) is instantly vaporized. Since the water content in cells is very even in the face as well as between people, a predictable layer of about 60 µm of skin is ablated. Since almost all of the energy from the laser is used up in this process, there is very little left over to heat the remaining tissue. This tissue then goes on to heal much more rapidly and predictably than after a thermal (heat) burn. The process, therefore, although likened to a burn, is really very different from one in terms of tissue injury and healing. The second thing which occurs is that the main structural protein in the skin, called collagen, undergoes a change in its shape called a conformational change. When it undergoes this change, its long fibers actually contract, leading to an overall tightening of the skin. This

tightening between scars or wrinkles, particularly when it is applied over a large area, results in a large part of the smoothing effect seen with laser resurfacing. This is one of the reasons that it is often preferred to resurface a large area as opposed to a small one in order to maximize this effect. It is also, locked into place by the new layers of skin which grow in the healing process. It is this effect which will lead to the long-term benefits of the resurfacing process and which many of us believe will likely be continued to be displayed for several years following the procedure.

There is a common misconception, proffered by the media and displayed during talk shows, that the laser resurfacing procedure is painless and that the recovery time is almost non-existent. Both of these notions are entirely false. Indeed, the laser resurfacing procedure is very painful while it is being performed, necessitating either intravenous sedation or, preferably, general anesthesia. The latter is preferred because no local anesthetic needs to be injected into the skin, thus allowing all of the irregularities to be appreciated by Dr. Caputy at the time of the resurfacing. The benefits of this over essentially guessing at the irregularities after having marked them preoperatively is obvious. The second notion, that of a short recovery time is also untrue. Although lasers are often used to shorten the recovery time of conventional surgical procedures because of decreased swelling with their use, when used to resurface the skin, the healing time is rather long and bothersome. Although there is really very little pain or discomfort after the resurfacing procedure, the healing time is long in that the skin is very raw for a period of 4 to 5 days following the surgery. Indeed, there is no top layer of skin present as this was removed with

the first pass of the laser. The raw surface oozes *serous* (clear or slightly yellowish tissue) fluid for this time period. After that time, for the next 4 to 5 days, the skin surface remains very red and tender (much like a superficial scrape or burn). After that time period, the first 10 to 14 days, makeup can be worn and a new superficial layer of skin is present. The application of barrier ointments (most commonly petroleum jelly) can be stopped and normal activities can recommence. Sun protection must be worn for the ensuing six months **at all times**. The recovery period of almost 2 weeks is something that must be planned for in everyone's busy schedule and is, actually, slightly longer than the recuperation from most classical cosmetic surgery procedures.

Why then use lasers for resurfacing. The answers to this are multiple and very clear. They afford the most control and precision of any technique to date. The risk of scarring is, thereby, greatly reduced. This is directly opposed to the technique of *dermabrasion*, where the resurfacing is done with a moving burr. The control is greatly lacking as is precision in comparison to laser resurfacing. The laser procedure is gentle to the skin and produces very little trauma to the remaining skin cells. They do not affect the *melanocytes* or pigment producing cells of the skin, unlike the phenol and trichloroacetic acid used in *chemical peels* which are directly toxic to these cells. This is the reason that, if a chemical peel is performed deeply enough to remove deep wrinkles, there is very white, almost ashen, skin color produced. Also, with both chemical peels and dermabrasion, control of the depth of the peel, even in very

experienced hands, is lacking with resultant increased risk of scarring.

There are risks with any procedure. With laser surgery, when properly conceived and performed, the risks are minimal. There is a particular danger to the eyes when light of this intensity is used. We carefully adhere to all OSHA guidelines regarding signage, goggle and protective eyewear use, door placement and other recommendations for protection of staff and patient vision. When operating around the eyes, special eye protection is always provided to the patient. There is a small risk of scarring with any laser procedure, but these are vastly minimized due to the precise control and predictable depth of penetration of the laser light. There is a risk of infection whenever the skin is transgressed (e.g. with laser resurfacing) but surgical clean technique is used throughout the procedure and the risk of infection is very slight. Should one occur, topical or oral antibiotics almost always control the infection rapidly. There has been found to be no risk of carcinogenesis from any form of laser treatment. There is always a small risk of reaction to the anesthetic or sedative used for your comfort, but, again, these are minimal and we have the treatments for severe reactions readily available should they occur. There is a risk of uneven pigmentation, particularly in non-Caucasian or darkly pigmented patients. These risks are minimized by proper pretreatment before the procedure as well as by expertise with patients who may have *post inflammatory hyperpigmentation*. Dr. Caputy is an expert in wound healing and has a great deal of experience with this condition. Surgical risks are particular for the given procedure and

will be discussed individually for each procedure with each patient preoperatively. Risks are minimized by proper training of the laser surgeon. Dr. Caputy is fully trained and accredited in laser surgery. He trained for over 4 months with the most modern laser systems in Europe and has had more than 3 years of training specifically in aesthetic surgery *after* board qualification in plastic surgery. He has taken accredited courses in laser use and surgery, one at Harvard University. He is fully laser accredited and has privileges to perform laser surgery at Kapiolani, Kuakini and Queen's Medical Centers. **AESTHETICA** is a fully accredited surgical facility and only anesthesia professionals are used for the delivery of sedation and anesthesia for patient comfort.

I hope that this short informational brochure answers some of the questions which you have about laser surgery. Please ask either the staff of **AESTHETICA** or Dr. Caputy should you have any other questions about laser surgery and skin resurfacing.

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