Microcavitation in ultrasound

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ID No. Microcavitation in Ultrasound Ultrasound is a technology that uses sound waves (Roberts, par. 1). The sound waves, not detectable by human ear, belong to a range of frequency from 3 MHz to 7. 5 MHz (par. 1). Humans can hear a frequency range of 20 to 20, 000 Hz (par. 1). Studies have revealed that people at a younger age can hear some frequencies of ultrasound but such ability decreases as a person becomes older (“ About Ultrasound”, par. 1). Ultrasound waves produce energy that penetrates the tissues, and converted to heat (ranging to an increase in temperature from 0. 5 degree to 1 degree centigrade) (Roberts, par. 3). Two effects are produced by ultrasound upon biologic tissues, thermal changes and microcavitation (par. 3). The development of minute bubbles in the tissues due to application of ultrasound is called microcavitation (par. 3). In diagnostic procedure, the sound waves emitted by the machine penetrates the tissues in the body and reflected back to the machine that forms an image that can be viewed on the screen (Roberts, par. 2). The body imaging procedure that uses ultrasound in diagnosis is called ultrasonography (Wedro 2). Ultrasound is utilized in fetal imaging and other bedside procedures (e. g. assessment of abdominal pain) (2). It is used in diagnosis, screening and therapeutic purposes (1). Ultrasound has been particularly useful in obstetrics. Despite the bubbles produced during the procedure, there has been no confirmed study that microcavitation has negative impact upon insonated fetal cells; the manner of releasing the ultrasound can minimize adverse effect though (Predanic, Chervenak, and Reece 117-18). In the area of beauty and health, the Rouge procedure wherein Aqualex (gel-based liquid solution) is injected into a targeted fatty area (through intra-lipotherapy tumescence technique) bolsters the formation of microcavitation

in the fatty tissue upon the application of ultrasound (Sister, pars. 5-6). The heat or thermal changes in the tissues that occur beneath the skin and not even felt by the patient facilitate cosmetic restoration (“ About Ultrasound”, pars. 10-11). In ultrasound–assisted liposuction (UAL), ultrasound with a specific intensity can create “ microcavities in a liquid or semiliquid medium during the expansion cycle” (Baxter, par. 6). Sound waves are comprised of “ alternating expansion and compression cycles” with the former exerting a negative pressure upon the medium and the latter a positive pressure (5). During this process, there is a movement and transfer of ions while intracellular action is affected (“ About Ultrasound”, par. 4). Fat cells, which have a low molecular cohesion, are low-density tissues and susceptible to microcavity, according to Michele Zocchi (UAL developer in Italy) (Baxter, par. 8). An appropriate application of ultrasound will not create unstable bubbles (that can explode or dissolve), and can be achieved by continuous expansion and contraction of bubbles resulting to a “ dynamic equilibrium” (par. 8). Ultrasound is particularly useful during the expansion cycle (during negative pressure) to produce microcavities (par. 6). Using an ultrasound massager, microcavitation changes the “ structure of the lipid bi-layer of the stratum corneum . . . breaking down the fats and oils holding the skin taut” and sheds off dead skin cells; very tiny channels are created in the process on which medicine, cream, nutrients, etc. can be applied (“ Ultrasonic Handheld”, pars. 2-3). This helps in the treatment of skin and musculoskeletal problems and injuries, as well as enhancement of healing and relief of pain (par. 4). Works Cited About Ultrasound. Palacia Beauty Device. 2011. 30 January 2011 . Baxter, Richard A. Liposuction, Internal Ultrasound-Assisted. 4 February 2008. 30 January 2011. . Predanic, Mladen,

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