

UltraShape® Mechanism of Action

The UltraShape V3 works by emitting acoustic waves of focused ultrasonic energy that converge into a confined focal volume targeting only subcutaneous fat at a controlled depth. Unlike traditional ultrasound technology, UltraShape V3's energy transmits pulsed ultrasound, allowing control over temperature elevation and enabling fat destruction to occur instantly, selectively and mechanically (non-thermal).

The UltraShape Transducer

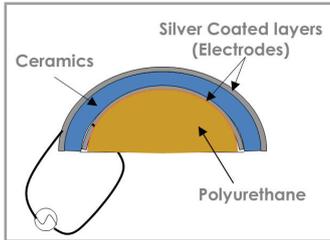


Figure 1

The heart of the UltraShape handpiece is a silver coated half dome shaped ceramic, filled with polyurethane. When electrical voltage is applied to the silver coating, an electric field is created within the ceramics causing alteration in the ceramic thickness. This in turn creates pressure waves within the polyurethane medium – these pressure waves are interpreted as sound waves and create the ultrasonic energy. (Figure 1)

Focused Ultrasound: The rounded shape of the ceramic delivers low energy at the surface, but provides a concentrated intensity of energy where the ultrasound waves converge at the focus. This focused energy allows targeting of defined tissues at a controlled depth, while leaving adjacent structures, such as skin, blood vessels, nerves, and muscles, unharmed (Figure 2).

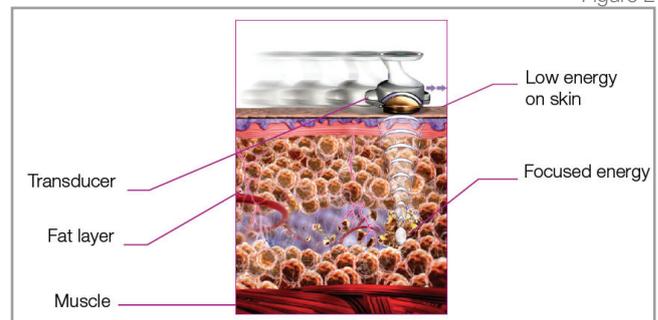


Figure 2

Pulsed Mode: The UltraShape transducer delivers the energy in bursts; this unique feature allows the generated heat to dissipate before the next pulse begins. This minimizes the temperature rise (0.5 C) within and around the targeted tissues. The energy delivered is transformed into mechanical stresses that remain within the focus and exist only for the duration of energy delivery. This allows the targeting of tissues that are most susceptible to mechanical disruption, while more resistant structures remain intact.

Fat Clearance:

The most common concern regarding non-invasive fat reduction is what happens to the destroyed fat cells. In clinical studies that have been conducted by Teitelbaum et al. (2007), the blood laboratory tests concluded that there were no clinically significant changes. During the UltraShape procedure, the membranes of the fat cells are disrupted. The fat cell content, primarily composed of triglycerides, is dispersed into the interstitial fluid among the cells and then cleared via the lymphatic system and transported through the vascular system to the liver. The liver makes no distinction between fat coming from the procedure and fat originating from consumed food. Both are processed via the body's natural mechanisms, the lymphatic, venous, and immune systems. The triglycerides from the broken fat cells are released into the interstitial fluid. They are then metabolized by the lipase enzyme into glycerol and free fatty acids. Glycerol is phosphorylated and transported through the vascular system. The 3-free fatty acids are bound to each albumin molecule and transported to the liver. Fat metabolites are processed in the liver in the same manner as fat originating from digested fat. The cell debris is eliminated by phagocytosis. (Figure 3)

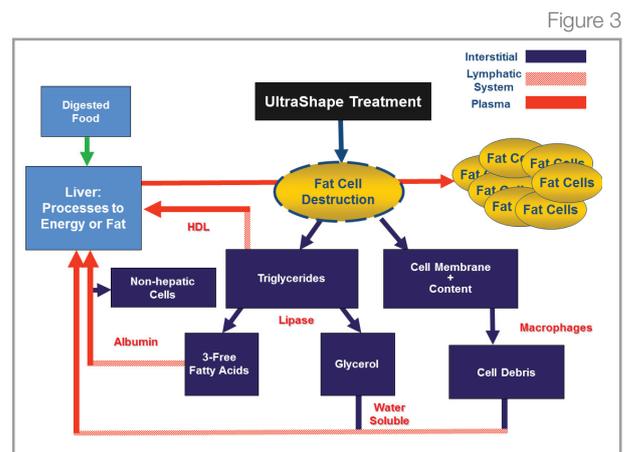


Figure 3