

Introduction: Cryolipolysis has been evaluated in animal studies [2] and it has been shown that increased duration of cold or more extreme cold results in more fat destruction. This fat destruction [4] occurs gradually over 3 months. To minimize adverse side effects it is necessary to limit the cold severity and duration. It has been general protocol to wait two months to retreat an area for further fat destruction as it requires this much time frame for most of the damaged adipocytes to absorb. It has been shown [3] that there is more fat destruction if immediately after cryolipolysis the area is vigorously massaged. Massage capabilities in different offices varies considerably and there have not been any studies doing repeated massages to the treatment areas. For this reason we attempted to standardize shock wave treatment to the treated areas for 3 minutes immediately after Cryolipolysis and at 4 weekly intervals.

Methods: Ten patients were assigned randomly to one of 2 groups. One group to get acoustic wave treatments, the other group to get vigorous massage during the first treatment only. The fat layer thickness was determined by use of My LAB Five ultrasounds with a gel standoff. The thickest area of fat in the center of the treated area was measured on each side of the abdomen. The ultrasound techs were blinded as to the patient groups. After each measurement the patients were either weighed or weighed and given a three minute acoustic wave treatment. The acoustic wave system used was the ZWave by Zimmer and settings were at 16hz and 90mj for 2500 pulses which takes about 3 minutes.

Results: As has been previously described in the literature [1] the Coolsculpting treatments were well tolerated by the 10 subjects. There was minimal discomfort from adding the acoustic wave treatments initially. It was comparable to the vigorous massage. Later acoustic wave treatments were performed with minimal discomfort. As shown in tables 1 and 2 the fat thickness was recorded for each patient at baseline and at 1,2,3,4 and 8 weeks. The average fat reduction percentage was then plotted on a graph showing superior fat reduction with the combination treatment. 77% of the 8 week fat reduction was achieved at the 4 week level in group one.

Group 1 with ZWave

Right Side	<u>Baseline</u>	<u>Wk 1</u>	<u>Wk 2</u>	<u>Wk 3</u>	<u>Wk 4</u>	<u>Wk 8</u>
MR	3.79	3.68	3.64	3.41	3.37	3.31
TF	4.7	4.67	4.47	4.25	3.95	3.49
JW	3.2	2.96	2.84	2.63	2.59	2.38
AW	2.72	2.52	2.42	2.04	1.84	1.65
SL	3.68	3.30	3.24	3.24	3.17	3.12

Left Side	<u>Baseline</u>	<u>Wk 1</u>	<u>Wk 2</u>	<u>Wk 3</u>	<u>Wk 4</u>	<u>Wk 8</u>
MR	3.80	3.79	3.64	3.57	3.36	3.30
TF	4.65	4.62	4.43	4.26	4.19	3.96
JW	3.23	3.20	2.97	2.64	2.62	2.42
AW	2.79	2.63	2.33	1.98	1.77	1.45
SL	3.95	3.63	3.54	3.49	3.44	3.43

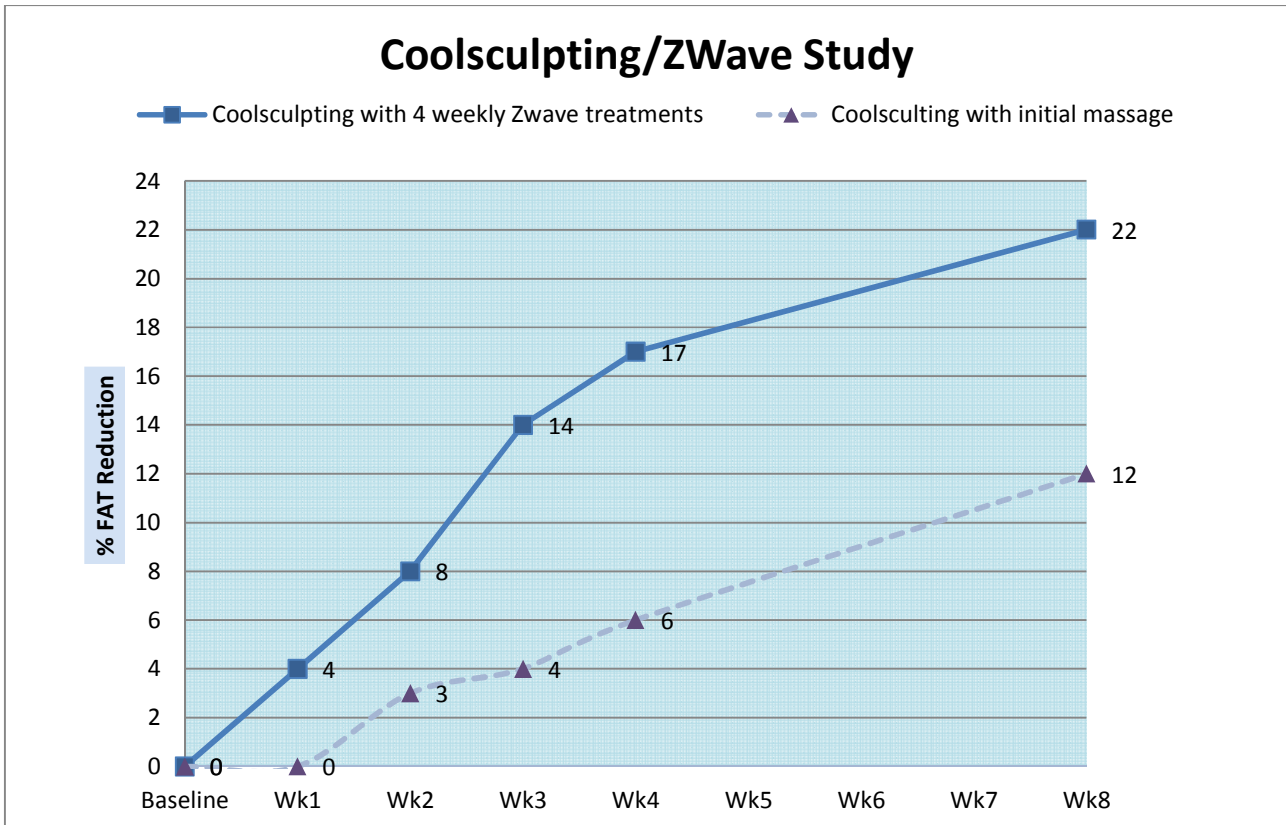
AVG % Fat Reduction	0%	4%	8%	14%	17%	22%
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Group 2 Without ZWave

Right Side	<u>Baseline</u>	<u>Wk 1</u>	<u>Wk 2</u>	<u>Wk 3</u>	<u>Wk 4</u>	<u>Wk 8</u>
MG	6.56	6.64	6.37	6.36	6.13	6.10
TS	3.86	3.85	3.74	3.73	3.64	3.56
JM	3.55	3.50	3.47	3.40	3.27	3.20
TP	3.26	3.19	3.08	2.93	-	2.55
MO	3.02	3.01	-	-	2.74	2.36

Left Side	<u>Baseline</u>	<u>Wk 1</u>	<u>Wk 2</u>	<u>Wk 3</u>	<u>Wk 4</u>	<u>Wk 8</u>
MG	6.20	6.31	6.19	6.17	5.93	5.90
TS	3.67	3.64	3.58	3.54	3.52	3.46
JM	3.41	3.40	3.38	3.28	3.22	2.93
TP	2.98	2.89	2.84	2.82	-	2.37
MO	3.05	3.02	-	-	2.79	2.46

AVG % Fat Reduction	0%	0%	3%	4%	6%	12%
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Discussion: This study was designed to see if there was a way to speed up fat absorption and shorten the interval between Coolsculpting treatments. The combination treatment group appeared to also have less post procedure discomfort which may be reflected by faster resolution of the damaged adipocytes and perhaps less inflammation. We believe there are multiple advantages to weekly acoustic wave treatments. Weighing the patients weekly seems to make them less likely to gain weight. The shortened interval gives quicker results and more patient satisfaction. We believe this will result in more treatments being performed. When multiple areas and repeated treatments are done we can get the “WOW” results that our patients desire. It would be interesting to evaluate post procedural pain on a weekly basis to see if there is a clinically significant difference between the two protocols. We believe there is based on patient comments. It would also be of value to follow and measure the fat reduction at the 3 month level to see if the combo treatment percentage of fat reduction is higher. Whether or not more acoustic wave pulses per treatment would result in further benefit has not been assessed.

Conclusion: The use of weekly acoustic wave treatments as an adjustment to cryolipolysis causes fat reduction at twice the normal rate for the first 4 weeks. This allows cryolipolysis treatments on a monthly schedule and body contouring results in half the time. More studies need to be performed to pool data and to see if more fat per treatment is eliminated by combining cryolipolysis and acoustic wave.

References:

- [1] C Dierickx, J Mazer, M Sand, S Koenig and V Arigon, “Safety, Tolerance, and Patient Satisfaction with Noninvasive Cryolipolysis” *Dermatol Surg.* (2013)
- [2] D Manstein, H Laubach, Kanna Watanabe, W Farinelli, D Zurakowski and R Anderson, “Selective Cryolysis: A Novel Method of Non-Invasive Fat Removal” *Lasers in Surgery and Medicine* 40:595-604 (2008)
- [3] G Boey, J Wasilenchuk and J Preciado, “Effect of post-treatment manual massage on efficacy following a cryolipolysis procedure” Abstract #50 *Laser Medicine and Surgery*, U of 44 (2012)
- [4] A Nelson, D Wasserman and M Avram, “Cryolipolysis for reduction of excess adipose tissue” *Semin Cutan Med Surg.* (2009)