



Getting To The Bottom Of EMS

ACE-sponsored research analyzes the Slendertone Bottom Toner electronic muscle stimulation (EMS) machine

By **John Porcari, Ph.D.,**
Stephanie Tepper, M.S.,
Mary Patrek, M.S.,
Josh Wilson, M.S., and
Sarah Horlitz, M.S.

“Sometimes being a mover and a shaker is not necessarily a good thing. If you’ve got a little bit too much moving and shaking going on, it’s time to get your muscles moving with Slendertone.”

This is the call to action from a recent television commercial for Slendertone and its line of electronic muscle stimulation (EMS) products. These wearable bands, fitted for either the abs, triceps or buttocks, use small electrodes that deliver electrical impulses through the skin to the muscles below, causing them to contract on command. The potential draw for consumers is the notion they can tone their muscles without taking the time to exercise. And the newest product from Slendertone, the Bottom Toner, promises to be effective on the buttocks—a frequently cited ‘problem area’ for many women.

EMS is nothing new. The technology was perhaps most notably used in the 1960s with Soviet athletes and has long been employed in the clinical setting worldwide for rehabilitating patients with musculoskeletal injuries. In the late 1990s, infomercials hawking less-effective home-based EMS training products began flooding the airwaves, promising rock hard abs without having to expend any effort. The experts at the American Council on Exercise took note and, in early 2000, sponsored research targeting the infomercial claims of EMS-based abdominal trainers. That research, led by John Porcari, Ph.D. of the University of Wisconsin, La Crosse, Exercise and Health Program, proved the products were ineffective and time-consuming and exposed their outlandish claims. Thanks to ACE’s publicity efforts, the research caught nationwide attention and eventually led to the Federal Trade Commission’s permanent injunctions against the

marketers of the Ab Energizer, the AbTronic and Fast Abs.

Since then, technology for in-home EMS products has improved somewhat and several of the more reputable EMS manufacturers have thankfully avoided advertising their products with outrageous claims. Still, all prey on the notion that many people are looking for an easy way to improve the appearance of their trouble spots, such as the buttocks. With that in mind, Porcari and ACE joined forces to investigate the efficacy of one of the newest EMS devices, the Slendertone Bottom Toner.

The Study

To test the effectiveness of the device, a team from the University of Wisconsin, La Crosse, led by Porcari, Stephanie Tepper, M.S., Mary Patrek, M.S., Josh Wilson, M.S., and Sarah Horlitz, M.S., recruited 72 female volunteers, ages 20 to 60 years. All volunteers were required to have a Body Mass Index (BMI) between 18 and 32, and could not have engaged in any lower-body strength training (such as squat exercises) in the previous six months. [NOTE: At the conclusion of the study, each of the subjects received \$200 plus a Slendertone Bottom Toner.]

The subjects were randomly separated into three groups: a control group (which did nothing), an exercise group (which performed conventional exercise) and a stimulation group (which used the Slendertone Bottom Toner). All of the groups were required to not alter their current exercise and diet regimen in any way during the six-week study period.



Prior to beginning the study, all three groups underwent an identical battery of tests including a pair of questionnaires (focusing on the shape and appearance of their buttocks region), a buttocks circumference evaluation, muscle tone test, and strength and endurance assessments. The same tests were repeated with each of the study participants during the fourth week and at the completion of the six-week study.

Once all of the baseline assessments were complete, the training portion of the study began. The stimulation group underwent 30-minute sessions, five times per week for six weeks. All used the Bottom Toner's Program #4, which employs a cycle of an 8-second contraction followed by a 12-second rest phase. The subjects were instructed to use the highest tolerable intensity level on their stimulators to achieve the strongest possible muscle contractions—

and thus gain the best results. Finally, those subjects in the exercise

group completed three sets of 10 quadruped hip extensions with each leg, five times a week for six weeks.

The Results

In terms of buttocks strength and endurance, regular use of the Slendertone Bottom Toner was as effective as a regular regime of conventional quadruped hip extension exercise.

Although there were no meaningful changes in body weight, BMI or hip circumference for any of the three test groups during the study, both the exercise and stimulation groups showed significant improvement in strength from pre-test to those test results at four and six weeks. After six weeks of training, buttocks strength improved 9 percent for the exercise group and 15 percent for the stimulation group. For endurance, both the exercise and stimulation groups had a significant improvement from pre-test to the six-week mark with a 26 percent boost in endurance for the exercise group and an increase of 29 percent for the stimulation group (Table 1).

The questionnaires, which tracked each subject's perception of buttocks firmness, strength, tone, shape and appearance, showed improvements in positive feelings in both the exercise and stimulation groups in the fourth and sixth week of testing. Even though there were no measureable improvements in muscle tone (according to myotometer readings), 92 percent of subjects in the exercise group felt that they had positive results over the course of the study while 88 percent of subjects in the stimulation group were positive about their perceived improvements, with subjects from each group feeling their bottoms were firmer, stronger, more toned, shapelier and more uplifted, as well as feeling that their jeans fit better after the six-week study (Table 2).

Table 1. Changes in Buttocks Strength and Endurance Over the Course of the Study

Strength (kg)	Pre-test	4 Week	6 Week
Control	25.2±6.17	25.0±6.01	25.7±7.22
Exercise	24.1±8.33	26.0±8.09**	26.2±8.91**
Stimulation	23.4±7.27	25.4±8.37**	26.2±8.35**
Endurance (sec)			
Control	234±52.0	244±59.8	258±61.8
Exercise	240±91.3	267±83.5	303±96.0**
Stimulation	238±75.2	278±90.3*	306±94.8**

* Significantly different than pre-test ($p < 0.05$)

Change from pre-test is significantly different than the change for the control group at the same time point ($p < 0.05$)

Table 2. Positive Responses to Individual Questions on the Overall Results Questionnaire (0%)

	Control	Exercise	Stimulation
Q1: Had positive results	0	92%	88%
Q2: Bottom muscles firmer	0	83%	88%
Q3: Bottom muscles stronger	0	92%	83%
Q4: Bottom muscles more toned	0	79%	83%
Q5: Bottom more shapely	0	58%	58%
Q6: Bottom more uplifted	0	71%	67%
Q7: Jeans fit better	0	71%	67%

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4851 Paramount Drive
San Diego, CA 92123

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The Bottom Line

While EMS is a proven and effective tool for restoring normal muscle function in the rehab environment and these test results do indeed show equivalent strength and endurance improvements between the exercise and stimulation groups, ACE's Chief Science Officer, Cedric Bryant Ph.D., stresses the importance of "measuring apples to apples" when reviewing this research.

Keep in mind, the exercise group did just 60 repetitions (at about six seconds per rep) of the quadruped hip extensions during each workout which equates

to only about six minutes of exercise per session. Meanwhile the stimulation group spent 30 minutes using the device per session—which works out to five times the amount of time devoted by the exercise group.

"If the individuals in the exercise group devoted an equivalent amount of time to traditional exercise they would've likely achieved results that far exceed those of the EMS device," says Bryant.

"People often cite lack of time as one of the chief reasons they don't exercise," he adds, "but if you can find 30 minutes a day to shock yourself, you should be able to find 20 to 30 minutes a day to do something where you're moving and get-

ting all the ancillary benefits of traditional exercise."

And that list of potential benefits is long, including weight loss, better balance, functional strength and toning in a wide variety of muscle groups (rather than just isolated to a single group as with the Bottom Toner), reduced stress and lower anxiety. Plus, exercise reduces the risk of numerous diseases and improves overall health—an unlikely outcome of using the Bottom Toner. Given its many positive returns, participation in traditional exercise is a much wiser investment that not only makes your jeans fit better, but makes you healthier and feel better, too. 