

**EFFECTS OF FASCIAL STRETCH THERAPY ON PAIN INDEX AND ACTIVITIES OF DAILY LIVING IN  
PATIENTS WITH CHRONIC NON-SPECIFIC LOW BACK PAIN**

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Oluwatosin Ayotunde

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Mentors: Paul Standley, PhD, Chris Frederick, PT, and Ann Frederick, FST

**Title**

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Medical Student:

Oluwatosin Ayotunde

University of Arizona – Phoenix College of Medicine, 2020

Email: opayotunde@email.arizona.edu

Phone: 520-635-9125

**Mentors**

Paul Standley, PhD

University of Arizona – Phoenix College of Medicine

Email: standley@email.arizona.edu

Chris Frederick, PT

Stretch to Win®, FST

Email: chris@stretchtowin.com

Ann Frederick

Stretch to Win®, FST

Email: ann@stretchtowin.com

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University of Arizona – Phoenix College of Medicine

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None

**Abstract:**

Effects of Fascial Stretch Therapy (FST) on Pain Index and Activities of Daily Living (ADL) in Patients with Chronic Non-specific Low Back Pain (LBP).

<sup>1</sup>Oluwatosin Ayotunde, <sup>1</sup>Paul R. Standley, <sup>2</sup>Chris Frederick, <sup>1</sup>Paul Kang, and <sup>2</sup>Ann Frederick

<sup>1</sup>The University of Arizona College of Medicine – Phoenix (USA) and <sup>2</sup>Stretch to Win Institute

**BACKGROUND:** Numerous fascia-focused therapies are used to treat pain, most relying on direct manipulation and/or tool-mediated techniques. FST, on the other hand, uses distally applied techniques to yield both local and global desired tissue outcomes and subjective pain improvement, including those related to LBP. We hypothesize that subjects receiving FST will have reduced nonspecific LBP and enhanced activities of daily living (ADL) scores.

**METHODS:** Eleven subjects who met study criteria (7F, 4M; Age 22-32 y/o) underwent 1 (N=11), 2 (N=7), or 3 (N=5) successive FST treatments (Tx in table below) which consisted of 30 min of 3-strap stabilization-mediated body stretch (8 per side). Subjects had pain and ADL scores (Bathing: BAT; Car egress/ingress: CEI; Toilet use: TOI; Forward bending: FOB; Dressing: DRE) measured pre- and 1- and 3- day post-FST. We used a linear mixed effects model to ascertain the relative % change in scores over time using the pretreatment time point as the reference group. All p-values were 2-sided and p<0.05 was considered statistically significant.

**RESULTS:** Statistically significant improvements in pain and ADL scores (\*) were found at the time points shown in the table:

SCORE	1 Tx; 1 day post	1 Tx; 3 day post	2 Tx; 1 day post	2 Tx; 3 day post	3 Tx; 1 day post	3 Tx; 3 day post
PAIN	*	*		*	*	
BAT				*		
CEI	*	*	*	*	*	*
TOI						
FOB	*	*	*	*	*	*
DRE	*		*		*	*

Score improvements noted in the table ranged between 31% and 57% compared to pretreatment time point.

**CONCLUSION:** This pilot study shows that both single as well as multiple, successive 30 minute FST treatments improve pain and ADL scores, with the highest improvements seen in pain and FOB. Treatment was limited to only one 30-minute session on any given day. Limitations of this study, namely include low sample size of pilot study and lack of a no-treatment group, limits our ability to make definitive conclusions. However, future studies will include a no-treatment group as well as determine optimal treatment frequency. Additionally, measurements of additional variables aimed at mechanistic understanding of treatment effects will also be made. [All subjects were consented as part of a UA-approved IRB].

### **Introduction:**

Research in fascia has increased exponentially over the past decade. CNSLBP is a multi-billion-dollar cost to the medicine in America. Up to 2% of the United States Workforce is compensated for back pain annually (Andersson, MD 1999). In fact, 1 in 4 adults reported lower back pain as a reason for a visit to a physician (Deyo, MD. Et al 2002). There is anecdotal evidence showing that FST can provide marked improvement to individuals with CNSLBP. Myofascial stretching has shown to be effective in providing immediate pain relief in up to 94% of subjects, lasting relief in 63% and lasting relief of point tenderness in 23% of the sites addressed (Lewit et al.). This supports the theory that targeting the fascia in stretching should provide results The purpose of this research is to transfer the anecdotal evidence associated with CNSLBP to scientific research that shows that FST can be as good or even better for relief in individuals with CNSLBP as current methods in treatment of CNSLBP. In fact, Fascia is

progressively being studied for its role in muscle tone and its potential for treatment beyond the point of obvious pain in an individual (Hesch et al.). The research to be done will look at both qualitative and quantitative data in order to analyze whether or not FST can lead to significant improvement in individuals with CNSLBP. In order to analyze these aspects, such factors such as pain scale, reduction in use, dose and frequency of pain medication, increase in sleep hours, decrease in frequency of waking up due to back pain, and increase in range of motion will be measured. Myofascial stretch therapy has already been shown to provide a greater reduction in pain when incorporated with traditional self-stretching programs (Romulo Renan-Ordine et al 2011). The pain scale will be analyzed on a scale of 1-10 with one being the least pain and ten being the most. The pain scale will be analyzed once in the beginning of the study before any therapy is administered and again after the therapy sessions have been completed. The subjects will be asked to record their amount of sleep each night from the beginning of the therapy session till the end of the therapy sessions. The subjects will also be asked to record the number of times that they wake up each night from the first night of the therapy session till the end. The FST being performed on the individuals will also be aimed at the reduction of deficits in ADL caused by Chronic lower back pain. Chronic Lower Back Patients show a lower activity pattern than non-symptomatic subjects, especially in the evening time (Spenkelling et al 2002). Such deficits include

dressing, functional ability to move in and out of bed, up and down from a toilet, getting in and out of a car, need for use of a bar doing showers and essential activities such as going from lying to standing, standing to sitting and sitting to standing. In order to analyze these things a questionnaire that asks about the quantitative and qualitative variables pretreatment will be administered to the individuals who participate, and after the FST intervention method has been administered a post-treatment questionnaire on activities of daily will then be administered to the individuals. All the factors analyzed are directly related to back pain and improvement in these factors after four sessions would lead to the hypothesis that FST is effective in reducing pain in individuals with CNSLBP.

### **Methods:**

The technique of the FST to be used will utilize a treatment table with three comfortable stabilizing straps so as to stabilize one limb and isolate the limb being used for the stretch. Two straps will be placed at the thigh and one would be placed at the lower leg. The reason for the straps is to allow for passive relaxation of the subject while the practitioner performs the technique with correct biomechanics. The technique will be performed in a pain-free manner and if the subject reports any pain the technique will be altered. The technique will be performed slowly with the patient in order to allow the

subject autonomy in controlling his or her own body movement in the case of any discomfort. A tissue evaluation will be done on the lower back and pelvic hip and the sites of restriction in these areas will be targeted in the FST Technique. There will be four FST sessions spread out over two weeks.

We expect to recruit 15 patients for this study. If the difference in the pre-intervention versus post-intervention is 1 unit with an equal standard deviation, 15 patients would achieve a statistical power of 94%. If the standard deviation increases to 2, 15 patients would achieve a statistical power of 50%. If the number of patients decreases to 10, a difference of 1 with an equal standard deviation will achieve a statistical power of 80%. The low number needed for a significant result as well as the one session needed will help control for the possibility of individuals dropping out before completing all their sessions.

Demographics and clinical characteristics will be assessed using means, standard deviation for continuous variables and frequencies, proportions for categorical variables. The primary outcome for this analysis will be pain scores at 5 time points including baseline. The repeated measures ANOVA will be implemented to ascertain differences in means between time points. To control for confounding, the generalizing estimating equation will be used to ascertain mean differences in pain measurements among demographic and

clinical predictors. All p-values will be 2-sided and  $p < 0.05$  will be considered statistically significant.

The small sample size allows for enough people to be analyzed in order to spot a trend in back pain relief. The small sample size will also be beneficial in maintaining the maximum quality care in the individuals, which in turn will produce the best results in each patient. As discussed before, the effectiveness of the therapy method will be analyzed through factors that measure a reduction on pain and an increase in function in ADL. After the therapy sessions are completed and the data is analyzed it is expected that the pain scale will reduce, sleep time will go up, frequency of waking up at night will decrease, and functional ADL will be improved. Potential reasons for this therapy not to work may be due to the fact that there are several factors that could be causing back pain in a patient. Although the method might be good, there is always a chance that the back pain is being caused by something that cannot be alleviated by FST. Potential subjects will be mainly recruited from the general population of Arizona State University and the University of Arizona COM-Phoenix through the use of flyers. The Research provides no risk to the patients as the methods performed will be non-invasive.



## Results:

Statistically significant improvements in pain and ADL scores (\*) were found at the time points shown in the table:

SCORE	1 Tx; 1 day post	1 Tx; 3 day post	2 Tx; 1 day post	2 Tx; 3 day post	3 Tx; 1 day post	3 Tx; 3 day post
PAIN	*	*		*	*	
BAT				*		
CEI	*	*	*	*	*	*
TOI						
FOB	*	*	*	*	*	*
DRE	*		*		*	*

Score improvements noted in the table ranged between 31% and 57% compared to pretreatment time point.

Individual Pain scores on a 10-point likert scale are as shown:

Individual Patient Scores on 10-Point Likert Scale	Treatment Groups						
	Baseline	First Treatment		Second Treatment		Third Treatment	
		1 day post-therapy	3 days post-therapy	1 day post-therapy	3 days post-therapy	1 day post-therapy	3 days post-therapy
Number of patients	11	11	11	7	6	4	3
Pain [mean (SD)]	3.82 (2.04)	2.55 (1.61)	2.90 (1.37)	3.00 (2.31)	2.33 (1.51)	1.75 (0.96)	2.67 (1.53)
Forward Bending [mean (SD)]	3.45 (1.97)	2.27 (1.01)	2.55 (1.51)	2.29 (1.89)	1.67 (0.82)	2.00 (1.15)	1.67 (1.15)
Car Egress and Ingress [mean (SD)]	2.64 (1.63)	1.55 (0.82)	1.36 (0.81)	1.29 (0.49)	1.17 (0.41)	1.25 (0.50)	1.00 (0.00)
Dressing [mean (SD)]	2.00 (1.18)	1.27 (0.65)	1.64 (0.92)	1.00 (0.00)	1.50 (0.84)	1.00 (0.00)	1.00 (0.00)
Toileting [mean (SD)]	1.55 (0.93)	1.27 (0.90)	1.64 (1.21)	1.57 (0.96)	1.83 (1.33)	1.25 (0.50)	1.33 (0.58)
Bathing [mean (SD)]	1.18 (0.60)	1.27 (0.90)	1.27 (0.90)	1.00 (0.00)	1.17 (0.41)	1.00 (0.00)	1.00 (0.00)

Pain score interval percent chain:

Time points	Relative % Change (95% CI)	P-value
Pre-Therapy	REF	
Post-Therapy 1, Day 1	-40.5 (-54.8, -21.7)	<0.001
Post-Therapy 1, Day 3	-28.9 (-45.9, -6.4)	0.01
Post-Therapy 2, Day 1	-23.1 (-44.3, 5.9)	0.10
Post-Therapy 2, Day 3	-37.4 (-55.4, -12.1)	0.007
Pre-Therapy 3	-20.3 (-44.6, -14.5)	0.21
Post-Therapy 3, Day 1	-54.6 (-69.5, -32.7)	<0.001
Post-Therapy 3 Day 3	-22.3 (-50.0, 20.7)	0.26
Post-Therapy 4, Day 1	-52.7 (-76.7, -3.8)	0.04
Post-Therapy 4, Day 3	-52.7 (-76.7, -3.8)	0.04
Trend in Pain Scores Over Time	-5.17 (-9.70, -0.40)	0.03

Statistically significant reduction in pain after administration of fascial stretch therapy was found at four different time points; Within twenty-four hours after the first session of FST, three days after the first session of FST, three days after the second session of FST, and within twenty-four hours of the third therapy session. Activities of daily living also had points of improvements in ease; Three days after the second therapy session of FST. There was a statistically significant improvement in ease of Car egress and Ingress at all points of FST. There was no statistical change in Toileting at any point of FST. There was a statistically significant improvement in forward bending at all points of FST. There was a statistical improvement in ease of Dressing within twenty-four hours of the first therapy session of FST, within 24 hours of the second therapy session, one day after the third therapy session, and three days after the third therapy session.

### **Discussion:**

As mentioned before, lower back pain has become one of the number one reasons for adults to visit the doctor's office in the United States. The reason for this can be connected to many different variables. A major consensus for the reason behind this has to do with the change in the set-up of the workforce over time. Lower back pain frequently occurs in college students who begin to spend more time sitting down than they ever had to in high school. The

educational demands increase and so does the time spent sitting and studying, and so does the number of individuals that develop back pain. This phenomenon continues into the work force. So many jobs in society are desk jobs, with many people spending most of their workday sitting down. Sitting down, for so many hours a day, so many days a year undoubtedly can lead to back pain. Improper sitting habits have been proven to statistically significant in contributing to lower back pain (Yung-Hui Lee, Wen-Ko Chiou, 1994). A lot of time this back pain is a result of improper sitting posture over such a long time, causing gradual pain in the back, which can become chronic. Many other reasons also result in lower back pain in adults ranging from exercise habits to diet habits. This is where the research on FST comes in to play.

FST is a relatively new treatment method that has little to no research behind it. This therapy involves the utilization of fascia in the body as a conduit to release pain and provide an increase in functional motion in individuals. There are many methods that are used today in treating lower back pain. The methods range from physical exercise, puncture and heating to acupuncture, NSAIDs, narcotics, and many other types of treatment. In 1990 alone, an estimated \$192 million dollars was spent on medication used to treat back pain in the United States (Cherkin et al. 1997). The high cost of treating individuals with chronic back pain has contributed to the increasing cost of health care in

the United States. FST is an innovative and inexpensive method to treat chronic lower back pain. Not a lot of time or space is required. In fact, all that is required in order to perform FST is a massage table and a trained therapist in FST.

With the study being done, it is anticipated that FST will begin to gain more ground as a useful treatment in CNSLBP. With the hypothesis that this therapy will reduce pain in CNSLBP individuals, a reduction in narcotic prescription can also be expected to follow, which in turn will assist with a reduction in the number of people introduced to narcotics and therefore a decrease in the incredibly high number of individuals that abuse narcotics. Although there is not a lot of research about FST, it is still a practice that is increasingly becoming popular today. From people from the general population looking to get some relief from back pain to professional athletes and Olympians looking to recover from a rigorous training lifestyle, FST has become popular as an effective yet affordable form of treatment for CNSLBP. This pilot study shows that both single as well as multiple, successive 30 minute FST treatments improve pain and ADL scores, with the highest improvements seen in pain and FOB.

Treatment was limited to only one 30-minute session on any given day.

Limitations of this study, namely include low sample size of pilot study and lack of a no-treatment group, limits our ability to make definitive conclusions.

However, future studies will include a no-treatment group as well as determine optimal treatment frequency. Additionally, measurements of additional variables aimed at mechanistic understanding of treatment effects will also be made. [All subjects were consented as part of a UA-approved IRB].

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