




**Application for 2015-2016- Burnell Student Research Award**

**Office of Associate Dean for Research and Innovation  
Nova Southeastern University College of Osteopathic Medicine**

**Project Title:** *Efficacy of Osteopathic Manipulative Therapy (OMT) for Lower Extremity Edema Assessed via Measurements of Tissue Dielectric Constant and Girth.*

**Applicant (s):** Print each name and class (i.e., OMS I, II, III, or IV):

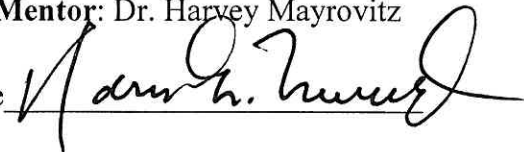
1. Nishant Patel Class: OMS II
2. Sunny Parekh Class: OMS II
3. Arash Zarrin Class: OMS II

1. Signature:		Date	<u>11/9/15</u>
2. Signature:		Date	<u>11/9/15</u>
3. Signature:		Date	<u>11/9/15</u>

**E-mail of Student Applicant (s):**

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**Faculty Mentor:** Dr. Harvey Mayrovitz

Signature  11/9/2015

**By 4 p.m. Monday, November 9, 2016** submit completed application electronically to levyleon@nova.edu or deliver to Office of Associate Dean for Research and Innovation

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**Summary of Proposal**

**TYPE FONT NO LESS THAN 12** and provide an abstract of 500 words or less including:

1. Hypothesis
2. Background/Significance
3. Methodology
4. Evaluation

**HYPOTHESIS:** We hypothesize that Osteopathic Manipulative Treatment (OMT) is an effective treatment modality in reducing lower extremity edema secondary to right-sided heart failure as measured by tissue dielectric constant (TDC) and extremity girth.

**BACKGROUND/SIGNIFICANCE:** Approximately 5.1 million Americans suffer from congestive heart failure (CHF). As the heart weakens, its ability to pump blood effectively declines. If the right side of the heart is involved, fluid backs up proximal to the right ventricle often resulting in peripheral edema (swollen and puffy legs). Leg edema is a clinically significant manifestation of CHF as it can lead to further complications such as decreased blood circulation, skin ulcers, opportunistic infection of the swollen areas as well as pain and difficulty walking. To date, there have been no studies which have evaluated the degree to which OMT can effectively reduce lower extremity edema specifically due to right-sided heart failure.

**METHODOLOGY:** An initial set of non-invasive measurements will be made on the extremity with the greatest edema prior to treatment. Using a calibrated tape measure the girth of the extremity at this site will be determined. Tissue dielectric constant (TDC) measurements at this site will then be made to quantify local tissue water content that are not reflected by the grosser girth measurement. TDC measurements made at 300 MHz are sensitive to both free and bound water. There will be two sets of measurements prior to the treatment start. The first set will be soon after the subject lies supine (M1) and the second will be done after 15 minutes of supine lying (M2). This two step assessment is done to help determine the effects of prior activity on measurement values. A third measurement set will occur about mid-way through the treatment (M3) and then a final set at the end of the treatment (M4). The treatment protocol will address various somatic dysfunctions in the pelvis and knee, utilizing myofascial release of the thoracic inlet and pelvic diaphragm in order to increase lymphatic drainage.

**EVALUATION:** This study seeks to use objective TDC measures to determine if OMT is an effective treatment modality for relieving lower extremity edema secondary to CHF. The primary data set is composed of TDC and girth measurements from 40 patients at four time points (M1, M2, M3 and M4). Because TDC values are a more sensitive measure of local tissue water change, TDC is to be the main assessment parameter with girth changes secondary. TDC changes due to OMT will be determined by comparing TDC values at M2 with those at M4. A reduction in TDC that reflects tissue water reduction will be deemed statistically significant based on a paired T-Test for a p-value less than 0.05. As secondary outcomes, the effect of supine lying will be determined by comparing values at M1 vs. M2 and the effect of the two main components of OMT will be compared using the values obtained at M3 vs. M4. Similar comparisons of girth changes will be made to determine if TDC changes and girth changes correlate.