

Characterization and Quantification of Superficial Skin and Core Temperature using Upregulation Taping Strategy on the Sacral Segments of S2-S4

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Abstract: Skin temperature is an important parameter in the estimation of all heat loss modes from the skin surface (Nilsson, 1987). Previous research concludes that to increase reliability and validity of surface temperature measurements, within 1°C, 2-6 surface sites must be used (Taylor et al, 2014). The above researchers chose 6 surface sites, recommended by current literature, to use for assessment: Left temple, left angle of mandible, left tympanic membrane, left middle finger (volar surface), L1 at naval and left **deltoid tubercle** (Taylor et al, 2014). These six sites were tested at base line, then at 15 minute increments for a total time of one hour in the previous study. These six sites were tested with surface temperature reading with the Etekcity Lasergrip 1080 Non-contact Digital Laser IR Infrared Thermometer Temperature Gun and the ultrasound doppler 8Mhz Probe. In addition to surface temperature assessment, each of the participants wore a Temp Traq unit and a pulse oximeter/heart rate monitor.

The data collected from this study demonstrated a consistent fluctuation in core temperature in those who received tape application on the sacrum, as **compared** with no fluctuation in those without tape application. More specifically, the following trends were observed:

1. Visual stimuli (watching a video during the study) prompted an increase in overall core temperature in all studied individuals; however, the control group (non-taped) had on average 1.8 F higher increase in their core temperatures than the taped group. 1.8 Fahrenheit is approximately 1 Celsius.
2. As the core temperature raised in all subjects, the non-taped group showed a pattern of peripheral heat loss of wider range while the taped group had a narrower and even distribution of the raised heat. It is speculated that the taped individuals may be better at disbursing the increased body heat.

Impression: The taped individuals had a less increase in core temperature as a group and a more restricted fluctuation of peripheral temperatures, indicating the possibility of **taping** at S2-S4 affecting the thermoregulation process in restricting core temperature increase and circulation of the increased heat. Since the body uses peripheral efferent feedback for thermoregulation, to elicit reactions of the vascular system and all the organs of the body to variations in environmental temperature, posture, food intake, stressful experiences and other changes to which all individuals are exposed (<http://www.ndrf.org/ans.html>).

The results of the first study further demonstrated a reliability of use of non-contact laser temperature readings at the six sites, as it correlated with changes in core, heart rate and oxygen saturation levels. The results of the Doppler were not consistent. This may be because

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the researchers were not specifically trained in use of the Doppler, and not that blood speed thru Doppler reads is not a valid form of assessment. This information may help produce further research on the relationship of body temperature on “affect”, muscle motor movement, and tissue health.

Proposal (Part A and Part B)

Part A: We are interested in testing six participants to re-investigate the six surface sites with use of laser gun, use of Temp Traq monitor and pulse oximeter/heart rate monitor to assess for any changes in core and surface temperature with and without use of **Kineseo tape** application on the sacrum. These six sites are areas that can be easily measured with low level instrumentation; while core temperature changes may also indicate a parasympathetic response.

1. Left tympanic membrane
2. Left angle of mandible
3. Left temporal region
4. Left middle finger (volar surface)
5. Left L1 – secondary neural point (next to naval)
6. Left L1 spinal segment

This study would again require six participants, three to undergo use of sacral **Kineseo tape** and three in a control group without tape application. The participants would be assessed at baseline then at 15 minute increments for a total of one hour following baseline readings.

Part B:

The second proposal is for another group of six participants who suffer from **chronic inflammation**. **The same testing** parameters as prescribed above for the non-pathological group.

Baseline measurements using the Temp Traq, surface temperature readings at the six sites with laser gun and pulse oximeter/heart rate monitor. These measurements would be taken every fifteen minutes.

The hypothesis is that while on non-pathological individuals, the application of sacral tape caused a fluctuation in surface and core temperature, as compared with non-taped participants; will sacral taping on pathological individuals with chronic inflammation cause a reduction in core, and thereby surface temperature.

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The researchers hypothesize that this new upregulation taping application on the sacrum (tape anchored inferior to S4, using inward/downward manual glide with 5-10 grams of pressure using the “inchworm technique” along the sacral segments of S4 to S2), created by Judith Macias-Harris and applied by Troy Lavigne, will elicit a systematic fluctuation in core and surface temperature, as compared with no fluctuation in the control group. Researchers will be looking for validation of the first study done. Likewise, we further hypothesize that this taping application may elicit a parasympathetic response in pathological individuals with chronic inflammation, as compared to the control group. This response will only be monitored for one hour following baseline readings and application of tape.

The study would take place in Denver, CO with Troy Lavigne in February/March 2017. The first day of research would include 6 healthy individuals, while the second day of the study would include 6 pathological individuals. We would do the same procedure as reported above.

Cost of this proposal:

1. 12 Temp TRAQ units. The devices would be used for core temperature monitoring, in conjunction with laser temperature readings at six surface points (as indicated above), as well as pulse oximeter/heart rate monitoring before and after application of Kinesio Tape. The same assessments will be conducted for those in the control group.
2. Air fare for two research investigators, Judith Macias-Harris and Elizabeth G. Harvey. This would be approximately \$600.00.
3. Hotel accommodations for two nights for researchers. Approximately \$200.00.
4. Food stipend for researchers for two days. Approximately \$200.00.
5. Clinic space rental \$500

Total cost of research proposal: \$1500.00

The researchers would like to present the data for the upcoming 2017 Kinesio Symposium and will be proposed for presentation for the ARK J Conference in 2017 (whose focus is trismus treatment for post radiation of head and neck cancer patients).

Thank you for your time and consideration of this project!

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