Protocol Title

Multi-center, 6-month, randomized, and controlled trial to compare the effects of Myo Munchee therapy and Oral Motor Therapy (OMT) in pediatric patients (aged 3-5 years) to treat maxillary deficiency and orofacial myofunctional dysfunction (OMD).

General Information

Protocol Title			
Multi-center, 6-month, randomized, controlled trial to compare the effects of Myo Munchee therapy and Oral Motor Therapy (OMT) in pediatric patients (aged 3-5 years) to treat maxillary deficiency and orofacial myofunctional dysfunction (OMD).			
Protocol identifying number	0001		
Version Number	27	**Version date**	25/04/2025
Clinical Trial Sponsor			
Sponsor Name	Myo Munchee		
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Address	3 Cowper St N, Carrington, NSW, 2294		
Independent Review Board			

Name	Allendale Investigational Review Board
Status of ethical review	☐ Approved ☐ In progress ☐ **To be submitted**
Trial Sites	1. 1721 N Halsted St, Chicago, IL 60614, United States 2. 135 North Harvey Avenue, Oak Park, IL 60302
Funding for the Clinical Trial	
Funding Body Name	Myo Munchee (Operations) Pty Ltd

Safety and Monitoring Contacts

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Introduction and Hypothesis

In combination, or as a sole disease entity, when Skeletal Malocclusion (SM), Orofacial Myofunctional Dysfunction (OMD), Sleep Disordered Breathing (SDB) and/or Tethered Oral Tissue (TOT) traits are present in Early Childhood (before the age of 72 months old), a young child's quality of life and general health status may be compromised.

Over a period of six months, when SM, OMD, SDB and/or TOT traits are individually, or in some combination, present in early childhood, Oral Motor Therapy (OMT) with, or without, adjunctive intervention with Myo Munchee Therapy (MMT), will result in improved SM, OMD, SDB and/or TOT trait co-morbidities.

Purpose

To evaluate the effectiveness of three different treatment options, either as sole interventions, or as adjunctive intervention strategies, for mitigating symptoms often associated with SM, OMD, SDB and/or TOT phenotypes when initially detected under the age of 72 months old.

Outcomes and objectives

For each child enrolled in the study, the outcomes below are desired.

1. **Primary outcomes**
    1. Palatal transverse width expansion
    2. Palatal sagittal depth expansion
    3. Palatal vault height expansion
2. **Secondary outcomes**
    1. OMD resolution
    2. Improvement in sleep and behavior
3. **Study objectives are intended for the practitioner community**

Eligibility Criteria, Materials and Methods

Eligibility criteria

Inclusion Selection Criteria:

1. Aged between 36 - 60 (3-5 yrs) months old and will not turn 6 years of age before the study completion
2. Diagnosed with having at **least two** maxillary skeletal-dental malocclusion traits as determined by the measurements below
    a. Palatal transverse (width), detailed measurement information described in methods section
        i. Anterior inter-canine width (Thilander study link)
            1. Male: age range (4.7-5.55 years); range 26.8-32.8mm, average = 30.5mm. If patient is below 26.8mm, eligible for study
            2. Female: age range (4.6 - 5.2 years); range 25.6-32.3mm, average = 28.4mm. If patient below 25.6mm, eligible for study
        ii. Posterior inter-molar width (Bogue index, 24mm + age) measurement for both male and female
            1. 3-year-old: and less than 27mm (posterior)
            2. 4-year-old: and less than 28mm (posterior)
            3. 5-year-old: and less than 29mm (posterior)
    b. Palatal sagittal depth/length (Thilander study link)
        i. Second deciduous molar (from distal alveolar crest to incisive papilla):

1. Male: age range (4.7-5.55 years); range 22.0-28.5mm, average = 25.1mm. If patient below 22mm, then eligible for study.
2. Female: age range (4.6 - 5.2 years); range 18.0-25.0mm, average = 21.4mm. If patient below 18.0mm, eligible for study.

c. Palatal vault height (Thilander study link)
   i. Second deciduous inter-molar height (measured from the center of the line connecting the disto-gingival margins of the 2nd molars (at alveolar crests) down to the contact with the mid-palatal suture):
      1. Male: age range (4.7-5.55 years); height range: 12.5-17.0mm, average = 14.2mm. If patient below 12.5mm, eligible for study
      2. Female: age range (4.6 - 5.2 years); height range: 12.0-16.0mm, average = 14.1mm. If patient below 12.0mm, eligible for study.

3. At least **one of the** identified OMD traits detailed below:
   a. Resting mouth posture (reference)
      i. Gently pull down the chin at rest and again look to see where the tongue is once the lips have opened. This is performed after movement, eating and while the patient is sitting. Video recording will be performed to corroborate finding. The other
         1. Lips open at rest
         2. Suspected mouth breathing during the day and night
         3. Tongue rests on the floor of the mouth
   b. Oral-Motor Developmental Sequence: Biting, swallowing and chewing function
      i. No adult chewing pattern, indicative of what's expected at 36 months. If patient doesn't meet the attached feeding criteria, then they are eligible to participate - link

Exclusion Selection Criteria

1. A patient must be considered healthy to be included in this study. Definition of healthy: the patient does not have ongoing treatment, medication or specialized assessments (more than routine follow up exams) with health care providers regarding a condition. If they have had treatment for a condition (e.g. treated by respiratory physician for acute asthma hospitalization), it must have been 12 months or more since their last appointment with a health provider related to that condition
   a. Of particular consideration
      i. Ongoing care from a sleep physician or respiratory physician
      ii. Current use of CPAP, nasal sprays, sleeping or behavioral medication to treat diagnosed sleep disorder or behavioral disorder
      iii. Adenectomy or tonsillectomy within last 12 months
2. Any previous or current tumors or traumas in the head, neck and jaw region
3. Patients with any known genetic or congenital conditions that impair oral motor muscle function, oral motor coordination, or speech articulation, such as but not limited to muscular dystrophy, cerebral palsy, will be excluded from the study.
   a. Patients with any known syndromic conditions to affect oral motor function, including but not limited to syndromes that involve craniofacial anomalies, neuromuscular disorders, or developmental delays affecting oral motor muscle control, speech

articulation, or swallowing, such as Down Syndrome, Pierre Robin sequence, or Moebius syndrome.

4. Children that do not have their 2nd molars by 36 months of age
5. Overweight, Z-scores
    a. BMI above 85th percentile (z score of 1)
        i. Boys: https://www.cdc.gov/growthcharts/data/extended-bmi/BMI-Age-percentiles-BOYS-Z-Scores.pdf
        ii. Girls: https://www.cdc.gov/growthcharts/data/extended-bmi/BMI-Age-percentiles-GIRLS-Z-Scores.pdf
6. History of prescription for therapeutic gum chewing and/or use of edibles in treatment program
7. Previous tongue tie releases (frenuloplasty and frenectomy)
8. Any therapeutic oral device treatment
9. Previous or current treatment from any other dental, OMT or orthodontic provider
10. Gross neglect of patient's oral health and presence of dental caries
11. Grade 4 tonsils on Brodsky scale

Screening Criteria

1. Accepts Myo Munchee on first presentation
2. Tolerates initial examination including taking measurements
3. Agrees to not seek out other medical treatment for their dental or OMD issues
4. Insufficient nasal patency - proxy for enlarged adenoids - unable to complete the Rosenthal test by reaching 20 breaths through nose with mouth closed (reference)

Materials

1. Myo Munchees
    a. Mini: 1.5 years - 4 years
    b. Junior: 4 - 8 years
2. OMT materials
    a. Dusico Balloon
    b. Tongue depressor
    c. Veggie straw
3. Dental materials
    a. iTero: https://itero.com/en-AU
    b. Palatometer - image 3 - link
    c. Caliper - https://www.harborfreight.com/hand-tools/measuring-marking/calipers-micrometer/calipers.html

Methods

Power Calculation

With n=12 subjects per group (1 control and 3 treatment groups), totaling 48 subjects overall, we will have at least 80% power to detect a LARGE[1] effect size (defined as mean difference relative to pooled standard deviation) of 1.2 or higher between any of the treatment groups and control group. With 6 subjects in the control group and 12 subjects in the treatment group, we will only have a power of 60% to detect an effect size of 1.2 or greater.

To have 80% power to detect a medium (d=0.6) effect size between any of the treatment groups and control, we would require n=45 subjects per group.

Method of treatment group allocation

Subjects eligible for participation in the study will be randomized to either Myo Munchee only (Group A) or Oral Motor Therapy only (Group B) or Myo Munchee + Oral Motor Therapy (Group C) or Control (Group D). Permuted block randomization with block size = 12 will be carried out using the following shinyApps: https://baker-biostats.shinyapps.io/pblockrand/. The randomization list will be attached to the enrolment document and concealed from the investigators until patients are recruited.

Treatment Groups

Dual certified Speech Language Pathologist and Certified Orofacial Myologist for the treatment groups will see all 48 patients

Group	**Patients**
Group A: Myo Munchee ONLY	12
Group B: Oral Motor Therapy ONLY	12
Group C: Myo Munchee + Oral Motor Therapy	12
Group D: Control, no treatment	12
Total number of patients	48

Treatment Protocols

Myo Munchee treatment protocol

The patients in this treatment group will use the Myo Munchee. Due to patient and therapist appointment scheduling, treatment may need to be performed over a video/internet call. This will be documented in the

[1] Using Cohen's d threshold for effect size (Cohen, 1988), small effect size = 0.2, medium = 0.5, large > 0.8

appointment notes whether it was an online or video meeting. Practitioner will also assess the ability of the patient to chew the Myo Munchee during each appointment and will note this.

Parental and patient education: https://drive.google.com/drive/folders/1gI8FREl1xU1-2jF6NQLFtHGfgMYGnyZ1

Patient requirements: Mirror used for exercises. Body is either standing against the wall, upright and supported in a chair or lying on the floor to ensure aligned posture. All exercises are performed 6 days per week (6/7)

Myo Munchee treatment protocol:

1. 1-minute x2 per day, week 1
2. 2-minute x2 per day, week 2
3. 4-minute x2 per day, week 3
4. 5-minute x2 per day, week 4
5. 6-minute x2 per day, week 5 onwards till 6 months

Total time commitment for at-home exercises: 72 minutes per week
Total time at-home commitment for 6 months: 72 hours

Oral Motor Therapy Treatment Protocol

This treatment group involves performing the required Oral Motor Therapy exercises. Due to patient and therapist appointment scheduling, treatment may need to be performed over a video/internet call. This will be documented in the appointment notes whether it was an in-person or online/video appointment.

Patient requirements: Mirror used for exercises. Their body is either standing against the wall, upright and supported in a chair or lying on the floor to ensure aligned posture. All exercises are performed 6 days per week (6/7)

Total time commitment for at-home exercises:

- Oral Motor Therapy exercises: 90 minutes per week = 90 hours
- The OMT exercises will be administered on an individual basis depending on the needs of the patient. This decision will be made by the clinician. They only have access to the exercises listed below and cannot prescribe any others

Materials needed:

- Tongue depressor
- Balloon
- Water spray bottle
- Veggie straw

Resources:

- Videos of all Oral Motor Exercises - https://www.youtube.com/playlist?list=PL-123PNzwf0kaNOfTFzExubUx4XssAXfo

Protocol

1. Tongue Jaw Dissociation Exercises
    a. Side to Side: 10x each side, 2/day nice and move nice and slow (so move as slowly as you can). Open mouth wide, move your tongue tip to the right corner of your mouth, then

the left. Make sure that your jaw stays still (support your child's jaw in your hands if needed). Make sure your tongue is flat and lifted off of your lower lip/teeth the best you can. That can be very challenging for a young child, so do the best you can. Your tongue should be the only thing moving. Make sure your tongue is flat and lifted off of your lower lip/teeth and move nice and slow. Your tongue should be the only thing moving. Target can be used if needed.

   b. Up and Down: 10x 2/day move nice and slow. Hold your jaw open wide and stretch the tongue up towards the bumpy spot on the roof of your mouth and then down below your lower teeth. You can use your hands again to support the jaw so that it does not move.
   c. Snake tongue (straight out): 10x 2/day nice and slow. Open mouth and ensure no other compensations are used (no movement of the lip, no facial tension, no neck tension. Don't let the head come forward. Make sure it stays in alignment). Stick tongue straight out, maintaining a pointed tip and narrow tongue. Be sure the tongue is not resting or dragging on the bottom teeth or lips. Retract the tongue back into the mouth. Make sure the tongue remains flat (the tip of tongue does not flip back or upward on retraction).

2. 5 sided push up: Make sure the lips are open and the Mouth is open wide and jaw is still and stable and open wide. Make sure your head rests right above the shoulders. Push your tongue tip against a Tongue depressor for 5 seconds in each position (up toward your nose, down toward your chin, one side and the other, and straight out). Repeat this '5x 2x/day.
3. Tongue clicks: Click your tongue. Bring the tip of the tongue behind your teeth and make a click. Now, try to make a click without letting the tongue flop down. It can be easier to do that if you put the tongue depressor under your tongue. Try to make sure that the tongue does not hit the stick. Click 25 times, or to make it more fun, click once for every letter of the alphabet. Do that 2x/day.
4. Tongue Bowls: Make your tongue cupped into the shape of a bowl. Lift it up towards the upper teeth. Keep the edges even so nothing spills out the sides. Hold for 5-10 seconds. Repeat that 10x/2x/day.
5. Tongue Cave: You're going to take the tip of your tongue and bring it behind your bath teeth. Click a few times, then see if you can get it to stick to the roof of your mouth. Make sure you're not just lifting your tongue tip, but that you're making a nice lingual palatal seal. Hold for 30 seconds and then repeat that 5x. Suction, squeeze and hold the entire tongue on the palate. Try to make sure that the tongue stays within the dental arch. It should not hang below or between the teeth. If one side of the tongue is less suctioned than the other, gently poke it with a straw to increase awareness and strengthen that side. Hold that for 30 seconds and repeat that 5x.
6. Suction Bites (Advanced Cave w/ Jaw Grading): While holding your lingual palatal suction (LPS)/Cave open and open and close your mouth bringing the back molars into occlusion (together). Ensure jaw is stable at the midline, not shifting left or right. Work up to 1 minute. Do that 2x/day. If your jaw is shaking, you can also provide supports (hands on your jaw to stabilize it).
7. Slurp & Swallows: Using a spray bottle, spray to get the mouth wet and then gently close the teeth, make a big smile, and then slurp and swallow. Repeat that 10x 2x/day.
8. Peanut Butter Rub with Cave: Tongue tip lifts up to the spot. Make a lingual palatal seal (or a tongue cave), and then slide the tongue back in the mouth while maintaining the suction. Repeat that 10x 2x/day.
9. Warm Air Puff: Inhale nasally, keeping the lips sealed, and blow the cheeks/fill the cheeks up with air. Move the air from one cheek to the other, then move it into the upper lip and the lower

lip. Remember to breathe through your nose! 10x in each position 2x/day. Work on pressing in on the cheeks without making a rude noise.

10. Balloon Exercises: 1. Blow the balloon just until it stands up and hold it with lips for 1 min. 2. try to blow up without cheeks puffing out: 30 seconds, 3. blow up the balloon until it is the size of an american softball and hold it between the lips by squeezing the lips without letting the air come out for 1 minute. 1x/day.
11. Molar Chew: Place long strip food like a veggie stick on the back molar. Bring the tongue tip back to touch the food and then bite. Chew the food completely, keeping it on the back molar with your tongue while you chew. Repeat on the other side. You should see the cheek retract and then you know the tongue is retracting as well. 10x on each side; 2x/day.

Oral Motor Therapy and Myo Munchee treatment protocol

This treatment group involves using the Myo Munchee for exercises as well as performing the required Oral Motor Therapy exercises. Due to patient and therapist appointment scheduling, treatment may need to be performed over a video/internet call. This will be documented in the appointment notes whether it was an in-person or online/video appointment.

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- Parental and patient education: https://drive.google.com/drive/folders/1gI8FREl1xU1-2jF6NQLFtHGfgMYGnyZ1

Protocol

1. Myo Munchee treatment protocol, detailed in Myo Munchee Treatment Protocol above
2. Tongue Jaw Dissociation Exercises
    a. Side to Side: 10x each side, 2/day nice and move nice and slow (so move as slowly as you can). Open mouth wide, move your tongue tip to the right corner of your mouth, then the left. Make sure that your jaw stays still (support your child's jaw in your hands if needed). Make sure your tongue is flat and lifted off of your lower lip/teeth the best you can. That can be very challenging for a young child, so do the best you can. Your tongue

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6. Tongue Cave: You're going to take the tip of your tongue and bring it behind your bath teeth. Click a few times, then see if you can get it to stick to the roof of your mouth. Make sure you're not just lifting your tongue tip, but that you're making a nice lingual palatal seal. Hold for 30 seconds and then repeat that 5x. Suction, squeeze and hold the entire tongue on the palate. Try to make sure that the tongue stays within the dental arch. It should not hang below or between the teeth. If one side of the tongue is less suctioned than the other, gently poke it with a straw to increase awareness and strengthen that side. Hold that for 30 seconds and repeat that 5x.
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9. Peanut Butter Rub with Cave: Tongue tip lifts up to the spot. Make a lingual palatal seal (or a tongue cave), and then slide the tongue back in the mouth while maintaining the suction. Repeat that 10x 2x/day.
10. Warm Air Puff: Inhale nasally, keeping the lips sealed, and blow the cheeks/fill the cheeks up with air. Move the air from one cheek to the other, then move it into the upper lip and the lower lip. Remember to breathe through your nose! 10x in each position 2x/day. Work on pressing in on the cheeks without making a rude noise.

11. Balloon Exercises: 1. Blow the balloon just until it stands up and hold it with lips for 1 min. 2. try to blow up without cheeks puffing out: 30 seconds, 3. blow up the balloon until it is the size of an american softball and hold it between the lips by squeezing the lips without letting the air come out for 1 minute. 1x/day.
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Data Analysis

Linear mixed model with random subject intercept will be used to compare treatment and control groups. Adjustments for demographic and clinical variables will be performed if necessary. The main statistical analysis will be performed using intention-to-treat (ITT) principle with a secondary per-protocol analysis. For the ITT analysis, all subjects with at least baseline measurements will be included, while for the per-protocol analysis, only subjects who did not deviate from the protocols will be included.

All statistical hypothesis testing will be performed using 5% significance level.

Measurements

Clinical Measurements

Dental Measurements

Videos demonstrations of measurement taking process.

- **Palatal transverse width** - measured at the primary canines (cusp tips) and the lingual surface of the 2nd molars (narrowest distance measured at gingival margins):
    a. Anterior intercanine measured between the primary canines (cusp tips) - Image 2a of Thilander et al. 2009.

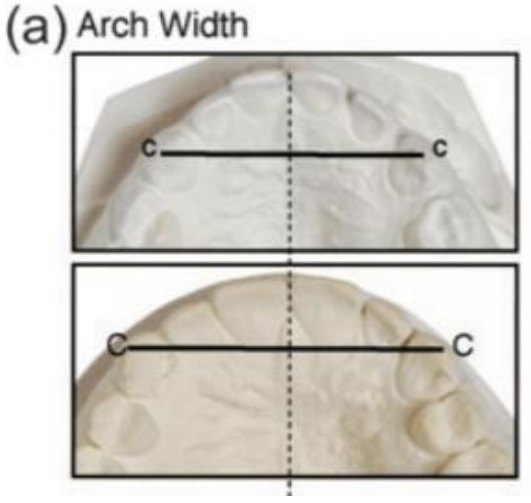


Figure. Image taken from Figure 2a of Thilander et al. 2009

b. Posterior intermolar measurement between the lingual surface of the 2nd molars (narrowest distance measured at gingival margins): Bogue index

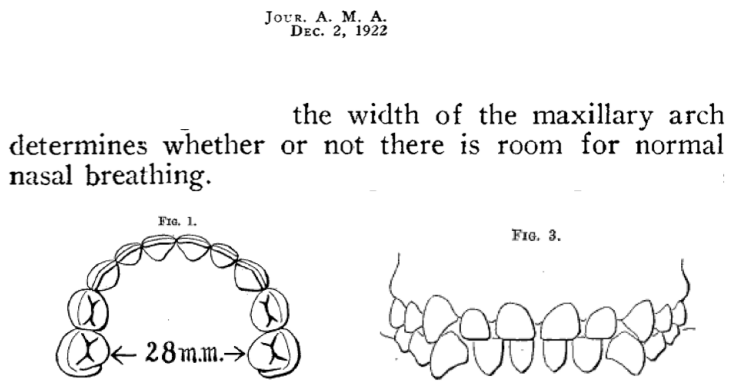


Figure. Image taken from Bogue, E.A. 'The Relations of the Dental Arches to Pathologic Affections of the Nasopharynx'. Amer Med. Assoc., Transactions of Section on Dis. of Childhood, 58:110 (1907).

- **Palatal sagittal depth/length** - measured anteriorly from the incisive papilla perpendicularly to a line connecting and posteriorly along the same line perpendicular to the disto-gingival margins of the 2nd molars (at alveolar crests);
    a. Posterior depth/length: Figure 3 from Thilander et al. 2009

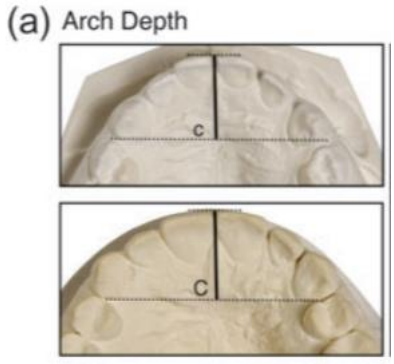


Figure. Image taken from Figure 3a of Thilander et al. 2009

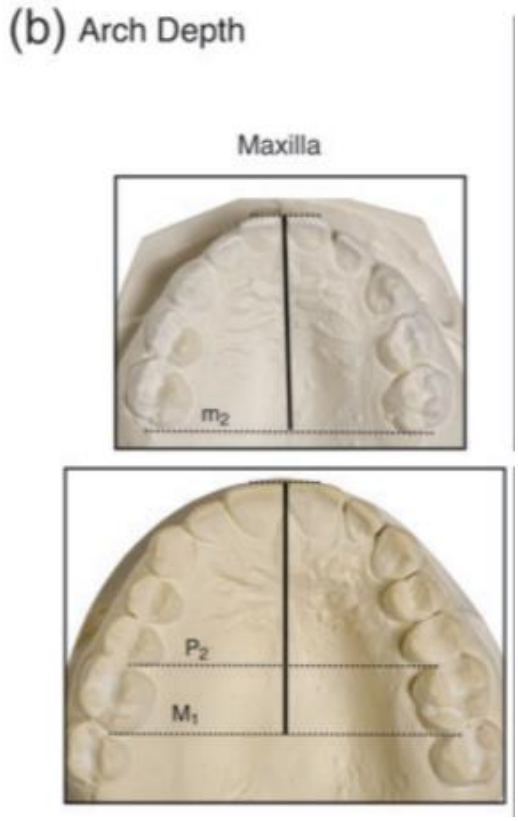


Figure. Image taken from Figure 3b of Thilander et al. 2009

- **Palatal vault height:** measured from the center of the line connecting the disto-gingival margins of the 2nd molars (at alveolar crests) down to the contact with the mid-palatal suture.

Figure. Image taken from Figure 4 of Thilander et al. 2009

- Any changes to patients usual oral routines

C-GASP questionnaire

This survey collects clinical information on the signs and symptoms associated with breathing disturbances.

Body Mass Index

Informed to be collected by patient's pediatrician or family physician and shared with dentist; refer to calculator for ongoing measurements https://www.cdc.gov/bmi/child-teen-calculator/index.html

Orofacial Myofunctional Dysfunction Measurements

Refer to 'OMD Measurements' document

Postural Assessment

Postural assessment will be assessed using the PostureCo, Inc. PostureScreen application https://www.postureanalysis.com/posturescreen-posture-movement-body-composition-analysis-assessment/.
Refer to appendix for further details

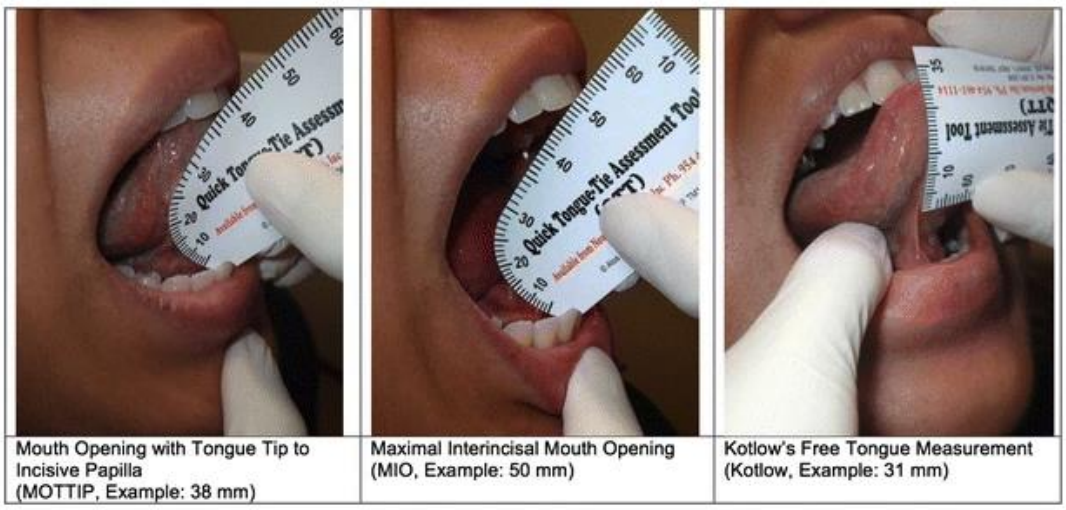
- Anterior, Posterior and Lateral Translations and Angulations
    a. Head
    b. Head weight
    c. Head-Ankle alignment
    d. Shoulders
    e. Hip/Pelvis
    f. Knee

Ankyloglossia

Functional classification of ankyloglossia

- **TRMR-TIP or % of tongue lift:** and taking into account compensation by holding the floor of the mouth down.
    - Refer to steps in figure 1 study on page 3 - Yoon et al. 2017 (reference)

- **Kotlow classification:** by frenulum position/distance from the tip
    - measuring the length of the ventral surface of the tongue (while in full extension) from the insertion of the lingual frenulum to the tongue tip



Examples of tongue functioning and length measurements using the Quick Tongue Tie Assessment Tool (QTT): mouth opening with tongue tip to incisive papilla (MOTTIP), maximal interincisal mouth opening (MIO), and Kotlow's free-tongue measurement. Tongue range of motion deficit (TRMD) is defined as the difference between MIO and MOTTIP. Tongue range of motion ratio (TRMR) is defined as the ratio of MOTTIP to MIO

Non-clinical measurements

Sleep Inventory Questionnaire

Refer to www.sleepinventory.com website for more information - https://www.sleepinventory.com/sdis-r-summary/

Patient compliance tracking

Once a month, the parent of the patient will fill out a 1-week survey to get compliance of the product usage for that week, there will be 6 of these compliance trackers collected.

Treatment Timeline

Measurement and evaluation timeline

1. Beginning at T-0 (when enrolled in study)
    a. All groups (including control): 1 hour at CCC-SLP and Dentist, total = 2 hours
2. Week 10 (2 months after starting treatment at week 2 (T2)) measurement and treatment appointment
    a. At CCC-SLP office

i. Myo Munchee only group: 60 minutes
ii. OMT only group: 60 minutes
iii. Myo Munchee + MFT group: 60 minutes
iv. Control group: 60 minutes

b. At Dentist office
i. All groups (including control): 30 minutes

3. Week 24 (6 months)
g. All groups (including control): 1 hour at CCC-SLPand Dentist, total = 2 hours

Treatment timeline

1. Initial treatment consults involve educating patients on protocol - occurs 2 weeks after first measurement and successful eligibility screen
   a. Myo Munchee ONLY group: 15 minutes
   b. OMT ONLY group: 30 minutes
   c. Myo Munchee + OMT group: 30 minutes
2. Every 2 weeks until week 10 (T10), 8 weeks after initial treatment appointment:
   a. Myo Munchee ONLY group: 15 minutes
   b. OMT ONLY group: 30 minutes
   c. Myo Munchee + OMT group: 30 minutes
3. Every 4 weeks after T10 until week 26 (T26):
   a. Myo Munchee ONLY group: 15 minutes
   b. OMT ONLY group: 30 minutes
   c. Myo Munchee + OMT group: 30 minutes

At home timeline

1. The exercises prescribed by the CCC-SLP will need to be completed at home outside of therapy appointments
2. The weekly and total time commitment over the 6 months
   a. Myo Munchee ONLY - 6 days/week
      i. Weekly: 72 minutes/week
      ii. Total at home time commitment = 31 hours
   b. OMT ONLY – 6 days/week
      i. Weekly: 90 minutes OMT exercises.
      ii. Total at home time commitment = 39 hours
   c. Myo Munchee and OMT - 6 days/week
      i. Weekly: 72 minutes Myo Munchee chewing, 90 minutes OMT exercises.
         1. Total = 2 hours, 42 minutes
      ii. Total at home time commitment = 70 hours

Total Time commitment

Enrolling in the study is a 26-week commitment with variation in time commitments for each group.

1. Treatment groups
   a. Myo Munchee Only:
      i. Initial measurement consultation: 1 hour at dentist and CCC-SLP = 2 hours

ii. T10 and T26 measurement appointments: 1 hour at dentist and CCC-SLP = 4 hours
iii. Treatment appointments:
    1. Before T10: 15 minutes every 2 weeks = 1 hour
    2. After T10: 15 minutes every 4 weeks = 1 hour
iv. Commitment outside of appointments: Weekly: 72 minutes/week. Total = 31 hours
v. Total time commitment: approximately **39 hours**

b. Oral Motor Therapy ONLY:

i. Initial measurement consultation: 1 hour at dentist and CCC-SLP = 2 hours
ii. T10 and T26 measurement appointments: 1 hour at dentist and CCC-SLP = 4 hours
iii. Treatment appointments:
    1. Before T10: 30 minutes every 2 weeks = 2 hours
    2. After T10: 30 minutes every 4 weeks = 2 hours
iv. Commitment outside of appointments:
    1. Oral Motor Therapy: 90 minutes/week. Total = 39 hours
v. Total time commitment: approximately **49 hours**

c. Myo Munchee and Oral Motor Therapy:

i. Initial measurement consultation: 1 hour at dentist and CCC-SLP = 2 hours
ii. T10 and T26 measurement appointments: 1 hour at dentist and CCC-SLP = 4 hours
iii. Treatment appointments:
    1. Before T10: 30 minutes every 2 weeks = 2 hours
    2. After T10: 30 minutes every 4 weeks = 2 hours
iv. Commitment outside of appointments:
    1. Myo Munchee: 72 minutes/week. Total = 31 hours
    2. Oral Motor Therapy: 90 minutes/week. Total = 39 hours
v. Total time commitment: approximately **80 hours**

d. Control group

i. Initial measurement consultation: 1 hour at dentist and CCC-SLP = 2 hours
ii. T10 and T26 measurement appointments: 1 hour at dentist and CCC-SLP = 4 hours
iii. Total time commitment: **6 hours**

Measurement and Treatment Timeline

Procedures		**^Eligibility criteria screen Week 0 (T0)**	**Initial treatment consultation - week 2 (T2)**	**#Treatment Every 2nd week**	**Week 10 (T10)**	**#Treatment Every 4th week**	**Study Completion Week 26 (T26)**
Informed Consent		X					
Assessment of Eligibility Criteria		X					
Therapy treatment protocol administration	Myo Munchee ONLY	X	X	X	X	X	X
	OMT ONLY	X	X	X	X	X	X
	Myo Munchee + OMT	X	X	X	X	X	X
	Control	X					
Clinical Measurements	*Patient History	X					
	**Dental	X			X		X
	**Orofacial Myofunctional Dysfunction	X			X		X
	Postural Assessment	X			X		X
	Ankyloglossia	X					X
Questionnaires	Sleep Disorders Inventory for Students - Revised	X			X		X
	***Compliance tracker	X			X		X
Additional data	Exit Interview						X
Adverse Events Evaluation				X	X	X	X

*Patient history form includes previous 3-day diet and medical history (included as part of Sleep Disorders Inventory for Students – Revised)

**Additional question to records any changes to the patient's activities, e.g. started chewing gum

***Compliance tracker: paper form will be completed each month by parent and upload to an online form
#After T10, the treatment appointments switch to every 4 weeks until T26
^Eligibility, Enrollment, Informed Consent, and Initial Data Collection will be performed when enrolled in the study. Treatment group allocation will be made after the patient meets all eligibility criteria.

Patient safety

1. Assessment of Safety Event Report Forms

Safety reports will be assessed on the seriousness, causality, and expectedness of the event to the trial treatment(s), intervention(s), investigational medical product(s), investigational medical device(s). The following are known and expected adverse effects, harms, risks, or discomforts associated with trial procedures, treatments, or interventions.

a. **Known Adverse Effects**
   None
b. **Known Harms, Risks or Discomforts**
   Gum irritation
   Masseter fatigue
   Orbicularis oris fatigue
   Tongue fatigue

2. Adverse Events

Any untoward medical occurrence, unintended disease or injury, or untoward clinical signs (including abnormal laboratory findings) in participants, users or other persons, whether or not related to the investigational medical device.
Adverse event reports must be reported to the Principal Investigator within 72 hours. All adverse event reports must be recorded in the Myo Munchee Protocol 0001 Safety Monitoring Register.

3. Adverse Device Effect

An adverse device effect (ADE) is related to the use of an investigational medical device. Including adverse events resulting from insufficient or inadequate Instructions for Use, deployment, implantation, installation, or operation, or any malfunction of the investigational medical device. This definition includes any event resulting from use error or from intentional misuse of the investigational medical device.

ADE must be reported to the Principal Investigator within 72 hours. All adverse event reports must be recorded in the Myo Munchee Protocol 0001 Safety Monitoring Register.

4. Serious Adverse Events

Serious Adverse Events (SAEs) that result in or lead to one or more of the following and the event is **not related** to the investigational medical product, the trial intervention, or procedures:

- The death of a trial participant.
- A life-threatening illness or injury involving a trial participant.
- A participant's permanent impairment of body structure or body function.
- In-patient or prolonged hospitalization (not for a pre-existing condition or an elective surgery) of a trial participant.

- Medical or surgical intervention to prevent life-threatening illness or injury or permanent impairment to a body structure or function of a trial participant.
- Congenital abnormality or birth defect.

SAE reports are classified following the safety assessment flowchart. SAE reports are reported to the Principal Investigator within 72 hours for multicenter clinical trials. SAR reports must be recorded in the Myo Munchee Protocol 0001 Safety Monitoring Register.

5. Serious Adverse Device Effects

A Serious Adverse Device Effect (SADE) is an SAE that is **related** to the investigational medical product, the trial intervention, or procedures. SAR reports are classified following the safety assessment flowchart.

a. Expected Serious Adverse Reaction

A serious adverse reaction by its nature, incidence, severity, or outcome is anticipated and identified in the current version of the investigational medical product or intervention safety information are classified as a SAR report. SAR reports are reported to the Principal Investigator within **72 hours** for multicenter clinical trials. Serious Adverse Reaction reports must be recorded in the Myo Munchee Protocol 0001 Safety Monitoring Register.

b. Suspected Unexpected Serious Adverse Reaction (SUSAR)

A serious adverse reaction by its nature, incidence, severity, or outcome is unanticipated and not identified in the investigational medical product, the trial intervention, or procedures for use safety information are classified as a SUSAR.

Fatal or life-threatening Australian SUSAR reports are reported to the Principal Investigator within 7 calendar days after being made aware of the case follow up information reported within a further 8 calendar days.

All other Australian SUSAR reports are to be reported to the Principal Investigator within 15 calendar days after being made aware of the case follow up information reported within a further 8 calendar days. SUSAR reports must be recorded in the Myo Munchee Protocol 0001 Safety Monitoring Register.

6. Significant Safety Issue (SSI)

A safety issue that could adversely affect participants' safety or materially impact the continued ethical acceptability or conduct of the trial. The Principle Investigator must be notified of all significant safety issues within 15 calendar days of the sponsor instigating or being made aware of the issue. SSI reports must be recorded in the Myo Munchee Protocol 0001 Safety Monitoring Register.

7. Urgent Safety Measure (USM)

A measure that is taken to eliminate an immediate hazard to a participant's health or safety. Significant safety issues where an urgent safety measure is required to be taken to eliminate an immediate hazard must be classified as a significant safety issue requiring an urgent safety measure. The Principle

Investigator must be notified of any significant safety issues that meet the definition of an urgent safety measure should be notified within 72 hours.

Examples include:

- a serious adverse event that could be associated with the trial procedures and that requires modification of the conduct of the trial.
- a patient population hazard, such as lack of efficacy of an intervention used for the treatment of a life-threatening disease.

USM reports must be recorded in the Myo Munchee Protocol 0001 Safety Monitoring Register.

8. Safety Assessment Flow Chart Investigational Medical Device Trials

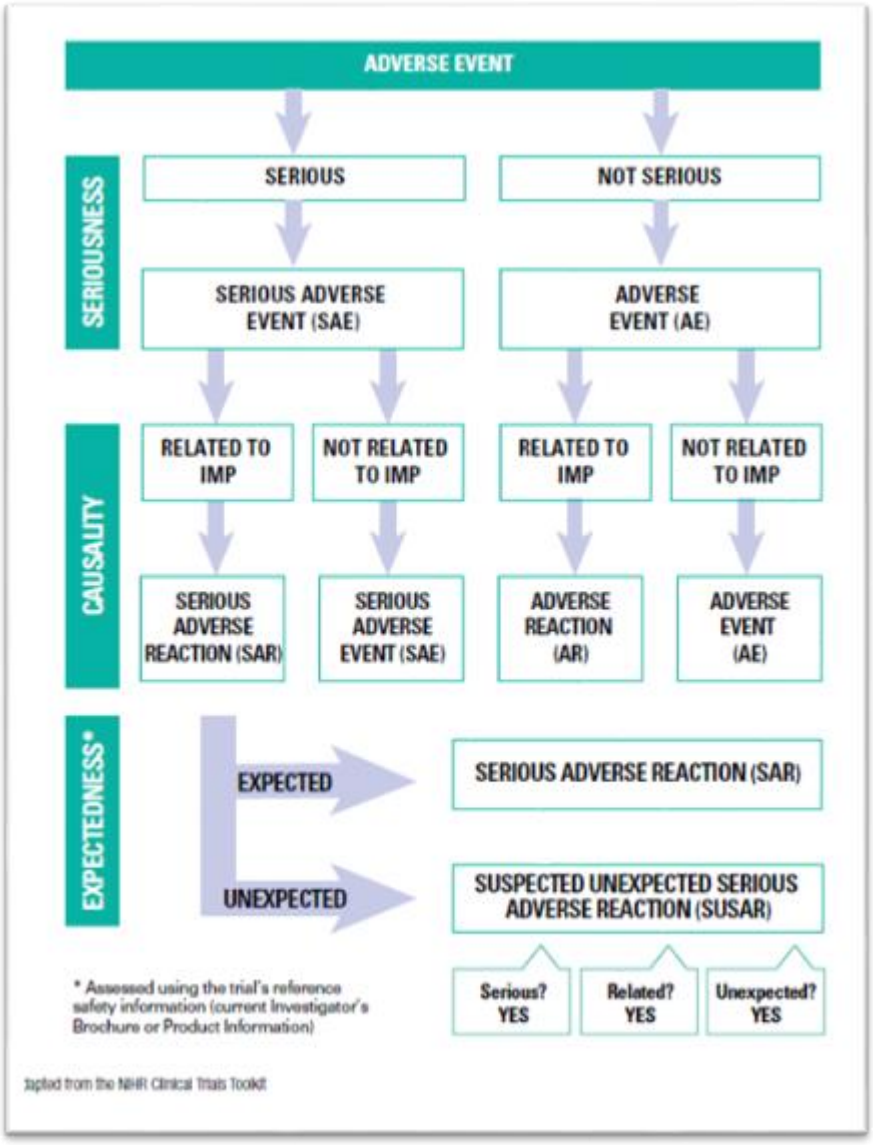


Image. Flow chart from UNSW Clinical Trial Protocol Template.

9. Register of Clinical Trial Safety Monitoring Reports

A register of all event reports assessed and classified is to be retained by the Principal Investigator**.**

10. Reporting of Clinical Trial Safety Monitoring Reports

Single case reports of Adverse Events Adverse Reactions, Serious Adverse Events (SAEs), Serious Adverse Reactions (SARs), reports do not need to be reported to the IRB. All single case reports must be recorded in a safety monitoring register.

11. Emerging Safety Issues

If safety concerns are identified, the principle investigator and involved staff members will establish a plan to minimize the time participants may be placed at excess risk of harm.

12. Non-compliance, Protocol Deviation and Serious Breaches of Good Clinical Practice

Protocol Deviation

A protocol deviation is defined as any breach, divergence or departure from the requirements of Good Clinical Practice, the clinical trial protocol, the clinical trial standard operating procedures, or the human ethics approval that does not have a significant impact on the continued safety or rights of participants or the reliability and robustness of the data generated in the research or clinical trial. Protocol deviations are events that do not occur persistently or systematically and do not potentially result in participant harm. Examples of protocol deviations include but are not limited to:

- Deviations because of participant adherence to the protocol, including rescheduled study visits, participants refusal to complete scheduled research activities or failure to complete self-report questionnaires required by the study protocol.
- The completion of consent forms, safety monitoring report, case report forms or data collection tools in a manner that is not consistent with the protocol instructions or failure to make reports within the required reporting timeframes.
- Administration of the clinical trial investigational medical product or device in a manner that is not consistent with the manufacturer's instructions for use.
- Use of an unapproved version of the participant information statement or recruitment of participants using unapproved recruitment procedures.
- Inclusion of a participant that does not meet the inclusion criteria.
- An urgent safety measure must be taken to eliminate an immediate hazard to a participant's health or safety.

Serious Breach of Good Clinical Practice

A serious breach is defined as a breach of Good Clinical Practice, the clinical trial protocol, the clinical trial standard operating procedures, or the human ethics approval that is likely to affect to a significant degree the safety or rights of participants or the reliability and robustness of the data generated in the clinical trial. Examples of serious breaches include but are not limited to:

- Persistent or systematic non-compliance with the instructions for completing consent forms, safety monitoring forms, case report forms or data collection tools that result in continued missed or incomplete data collection.
- Failure to record or report adverse events, serious adverse events, suspected unexpected serious adverse reactions, significant safety issues where urgent safety measures were implemented.
- Failure to conduct clinical trial procedures following the clinical trial delegation log.
- Widespread and uncontrolled use of protocol waivers affecting eligibility criteria, which leads to harm to trial subjects.
- Failure to report investigational medical product or device defects to the clinical trial sponsor or any relevant regulatory body.
- Failure to conduct research following the issued approvals, permits or licenses by required laws, regulations, disciplinary standards relating to the responsible or safe conduct of research.
- Concealing or facilitating breaches (or potential breaches) of the Research Code by others.
- Researching without the requisite approvals, permits or licenses required by laws, regulations, and disciplinary standards related to the responsible or safe conduct of research.
- Failure to conduct research as approved by an ethics review body where that conduct leads to (or has the potential to) results in participant harms.
- Any breaches as outlined in the US National Science Foundation Responsible and Ethical Conduct of Research conduct of research that leads to (or has the potential to) result in participant harms.

14. Reporting Protocol Deviations

- Protocol deviations occurring at a site must be documented in site files and reported to the Principal Investigator.
- The Principal Investigator must review the protocol deviation and the clinical trial protocol to establish the corrective actions and preventative steps to prevent the deviation from reoccurring.

15. Reporting of a Serious Breach

- A serious breach occurring at a participating site must be reported to the Principal Investigator within 72 hours.
- The Principal Investigator must review the serious breach, along with the clinical trial protocol, to develop a Corrective and Preventive Action (CAPA) that defines the steps to prevent the serious breach from reoccurring.

16. Review of a Protocol Deviation and a Serious Breach

- The Principle Investigator will review reports to establish whether the event meets the definition of a protocol deviation or serious breach, to establish whether the

proposed is appropriate and establish whether there is or will be an ongoing impact on the reliability and robustness of the data generated.

- Principle Investigator and Myo Munchee will seek advice from the approving IRB on the corrective and preventive action

Data Management and Software

Deidentification of data

1. Refer to this document for patient enrollment information - link
2. Patients will be assigned a code upon enrollment so that their information is de identified across all systems except for the clinics that they are receiving care
3. Case ID example: Ben Cook
    a. First subject enrolled in the study: 01
    b. First name: Ben
    c. First 2 letters of last name: CO
    d. Case ID: 01CO

Data Management

Patient data storage and disposal

- Data storage will be managed by Myo Munchee, SleepInventory.com a service of Child Uplift, Inc., and the Children's Airway Screen Taskforce (CGASP database)
- Storage of patient data will be for 15 years from the date the patient consents to be part of the study
- The data will be stored in the USA and Australia

Data safety, security and confidentiality

- Data will be de-identified by the treating practitioner and team in the clinic that the patient attends. Name and address will not be entered into the study database but will be entered into the clinics database. Instead, a patient identification number and month and year of birth will be assigned to the patient and entered into the database along with the email address that the parent enters for online questionnaire completion.

Data access

- The de-identified data will be accessible to the principle investigator and the study coordinator throughout the whole study and the biostatistician at the studies completion.
- The identified data will be stored and accessed by the treating clinicians throughout the duration of the study and while the patient is under their professional care.
- A user logbook of start and stop dates of data access will be maintained
- Data will be hosted in the USA and Australia

Data retention and publication

- Data will be retained for up to 15 years and will be used for journal publication, and presentation purposes

Data reviewing, validation and rectification

- Throughout the study, the data will be reviewed every month
- The data will be reviewed for quality purposes to ensure that accurate and correct information has been added to the database
- There will be inbuilt validation checks in the survey and clinical measurements form that the patients parent and treating clinician complete. This will assist in the user entering the correct data
- If there is clinical information missing, input incorrectly, or a mistake made by the treating clinician, this will be addressed and rectified to ensure that the correct information has been added to the database
- If a survey is incomplete or not attempted altogether. Within 1 week of the survey being sent out the parent will receive a reminder, however, after 1 week they will not receive a reminder and the information will be considered incomplete or missing

Data monitoring

- Independent data monitoring may be required if there are challenges confirming the database record discrepancies between the clinical records and the centralized database used for the study

Software - Patient data collection and storage

- Microsoft OneDrive
- Microsoft Excel
- Microsoft Forms
- Sleep inventory - https://www.sleepinventory.com/
- Children's Airway Screening Taskforce

Patient Recruitment

Patient recruitment process

Refer to Appendix for detailed description

Marketing and advertising materials for recruitment

Informational A4 letters for each individual practice have been developed so patients can read and understand what is required to participate in the study. Refer to Appendix for an example.

Financial Information

Compensation to patients for Participation

The compensation associated with participating in the study will be broken into treatment groups.

1. **Myo Munchee only group**
    a. Free Myo Munchee device
    b. Follow up measurement appointments at T10 and T26: covered by Myo Munchee
    c. Treatment appointments: all 15-minute appointments covered by Myo Munchee
    d. $250USD voucher if fulfill these criteria:
        i. Attend all measurement appointments (3 total)
        ii. Complete all monthly compliance logbooks (6 total)
        iii. Attend minimum 6 out of 7 of the 15-minute treatment appointments (7 appointments)
2. **OMT only group**
    a. $250USD voucher if fulfill these criteria:
        i. Attend all measurement appointments (3 total)
        ii. Complete all monthly compliance logbooks (6 total)
        iii. Attend minimum 6 out of 7 of the 30-minute treatment appointments (7 appointments)
3. **Myo Munchee and OMT group**
    a. Free Myo Munchee device
    b. $250USD voucher if fulfill these criteria:
        i. Attend all measurement appointments (3 total)
        ii. Complete all monthly compliance logbooks (6 total)
        iii. Attend minimum 6 out of 7 of the 30-minute treatment appointments (7 appointments)
4. **Control group**
    a. Free Myo Munchee device at end of study
    b. $250USD voucher if fulfill these criteria:
        i. Attend all measurement appointments (3 total)

The $250 USD voucher that can be spent at one or split across multiple practices

Costs for Participation

The costs associated with participating in the study will be broken into the treatment groups and to the specific appointments below:

1. Myo Munchee only group
    a. Measurement appointments:
        i. Initial appointment: billed to patient's insurance provider as an initial evaluation consultation
2. OMT only group
    a. Initial and follow up measurement appointments: billed to patient's insurance provider as an initial evaluation consultation

    b. All treatment appointments: billed to patient's insurance provider as OMT has established therapeutic benefit
3. Myo Munchee and OMT group
    a. Initial and follow up measurement appointments: billed to patient's insurance provider as an initial evaluation consultation
    b. All treatment appointments: billed to patient's insurance provider as OMT and Myo Munchee has established therapeutic benefit
4. Control group
    a. No cost

Ethics

- To be submitted to Allendale Investigational Review Board - https://www.allendaleirb.com/
- Email: rta1ali1@aol.com
- https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects