Osteopathic Manipulative Medicine Research: Where We’re At

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Conflict of Interest Disclosure

I have no conflicts and nothing to disclose

Objectives

By the end of the presentation, the learner should be better able to:

• Communicate some of the various challenges and approaches to Osteopathic Manipulative Medicine (OMM) Research
• Discuss areas of potential research that are likely to improve upon the understanding of and clinical application of OMM
• Recall some of the larger OMM studies of the past few years and discuss their findings
• List the current evidence-based OMM guidelines
Osteopathic Manipulative Medicine (OMM)

- Not the same thing as Osteopathic Manipulative Treatment (OMT)
- Not the same thing as Osteopathic Principles and Practice (OPP)

Goals of Clinical Research

- Explore the effectiveness & safety of an intervention
- Justify the resources required to provide the intervention

Some of the Challenges to Researching OMM

- “Objective” findings that can only be appreciated by a subjective experience
- Variability in the skills of those applying OMM or OMT
- What is OMT?
- Resources required to administer OMT to enough patients to achieve a well powered study
- Randomized Controlled Trials work well for studying a small number of known variables that are easily measured
- Pressure to show clinical relevance now
- OMM is often confused with OMT
Differential Diagnosis for Chest Pain

- Acute myocardial infarction
- Stable angina/CAD
- Vasospastic angina
- Pericarditis
- Pneumonia
- Pulmonary embolism
- Pleurisy
- Heart failure
- Thoracic aortic dissection
- Sickle cell disease
- Neoplasms
- Somatic Dysfunction
- Costochondritis
- Referred pain from thoracic spine/costovertebral joints
- Sternalis syndrome
- Fracture
- Tietze's syndrome
- Gastroesophageal reflux disease
- Esophageal motility disorders
- Perforation of the esophagus
- Anxiety
- Fibromyalgia
- Rheumatoid arthritis
- Axial spondyloarthritis
- Psoriatic arthritis
- Sternoclavicular hyperostosis
- Systemic lupus erythematosus
- Septic arthritis of the chest wall
- Relapsing polychondritis

Study Design

- Meta-Analysis
- Systematic Review
- Randomized Controlled Trials
- Cohort Studies
- Case Reports
- Unfiltered Information
- Filtered Information

Study Design: OMT vs. OMM

- Most OMT can be appropriately studied by RCTs
  - Fewer variables and outcomes
  - Techniques effect on somatic dysfunction
- Most OMM is better studied with observational, cohort studies
  - Allows for greater control of confounding factors
  - Somatic dysfunction's effect on a patient
**OMM: Areas of Potential Research**

- **Anatomy**
- **Neurophysiology**
- **OMM**
  - Education
- **Diagnosis of Somatic Dysfunction (SD)**
  - Diagnostic imaging or other tools that can evaluate SD?
  - Which SD matters the most: causative vs. compensatory?
  - Which are associated with which comorbid disease states?
- **Treatment**
  - Technique types and conceptual models
  - Are some OMT types more effective for certain types of SD?
  - Are some OMT types more effective for certain populations of patients?
  - Does timing of treatment matter?
- **Clinical outcomes**
  - Subjective & Objective measures
  - Treatment flares and complications

**Common Problems with OMM Research**

- Small sample sizes
- Underqualified/inexperienced technicians (students & residents)
- Suboptimal controls
  - No control
  - Shams applied to areas relevant to the disease process
- Suboptimal protocols
  - OMT to “treat” a symptom
  - OMT w/o diagnosis of SD
- Subjective outcomes
- Short-term follow up

**Effectiveness of OMT in Patient Care Categories According to the Five Models**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Highest Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neurological and Structural Models</td>
<td></td>
</tr>
<tr>
<td>Acute or chronic, back pain in adult patients, acute lumbar pain, or sciatica (LL)</td>
<td>A</td>
</tr>
<tr>
<td>Acute or chronic, mechanical neck pain with or without headache</td>
<td>A</td>
</tr>
<tr>
<td>Acute or chronic, mechanical neck pain with or without headache</td>
<td>A</td>
</tr>
<tr>
<td>Fractured hip fractures and dislocations</td>
<td>B</td>
</tr>
<tr>
<td>Flexion joint dysfunction</td>
<td>B</td>
</tr>
<tr>
<td>General mechanisms</td>
<td>B</td>
</tr>
<tr>
<td>Fractures of the pelvis</td>
<td>B</td>
</tr>
<tr>
<td>Acute ankle sprain</td>
<td>A</td>
</tr>
<tr>
<td>Post-operative pain in lower limb</td>
<td>B</td>
</tr>
<tr>
<td>Pediatric acute transmural pain</td>
<td>A</td>
</tr>
<tr>
<td>Acute ankle sprain</td>
<td>B</td>
</tr>
<tr>
<td>Post-operative pain in knee</td>
<td>A</td>
</tr>
<tr>
<td>Ankle sprain</td>
<td>B</td>
</tr>
<tr>
<td>Rheumatological Model</td>
<td>C</td>
</tr>
</tbody>
</table>
American Osteopathic Association (AOA) Guidelines for OMT for Patients With Low Back Pain- 2010

There was a significant reduction in low back pain associated with OMT in trials vs active treatment or placebo control (effect size, -0.26; 95% CI, -0.48 to -0.05; P=.02).
- This is comparable to nonsteroidal anti-inflammatory drugs, including cyclo-oxygenase-2 inhibitors
- OMT also significantly reduced pain during the 3- to 12-month period following randomization

There were significant reductions in low back pain associated with OMT during the:
- short-term (effect size, -0.28; 95% CI, -0.51 to -0.06; P=.01)
- intermediate-term (effect size, -0.33; 95% CI, -0.51 to -0.15; P<.001)
- long-term (effect size, -0.40; 95% CI, -0.74 to -0.05; P=.03)

AOA Guidelines for OMT for Patients With Low Back Pain- 2016

OMT has a significant effect on:
- LBP (acute and chronic)
- LBP in pregnant women
- LBP in postpartum women
- OMT may have a larger effect on pain than functional status.

According to the criteria recommended by the Cochrane Back Review Group:
- the significant effects found are also clinically relevant
PROMOTE Study- 2015

- N=400
- 3 groups
  - OMT + usual care
  - PUT (placebo U/S tx) + usual care
  - UCO (usual care only)
- OMT & PUT applied to the same body areas by an OMM specialist ~20mins w/in 24hrs of routine OB visits at weeks 30, 32, 36, 37, 38, & 39
- Only 99 women completed all 7 visits
- Primary Outcomes:
  - Quadruple visual analog scale (now, average, worst, best) that was used to calculate a characteristic pain intensity (CPI) (0-100)
  - Roland-Morris Low Back Pain and Disability Questionnaire
- Secondary Outcome:
  - Safety- no statistical difference in conversion to high-risk pregnancy was found between groups

The OSTEOPATHIC Trial- 2013

- N=455 (21-69yo, non-pregnant, LBP 3+ months)
- 4 groups
  - OMT + UST
  - OMT + Sham UST
  - Sham OMT + UST
  - Sham OMT + Sham UST
- Pt. randomized to receive interventions from either faculty DO, Resident, or NUFA Student (15 individuals) at weeks 0, 1, 2, 4, 6, & 9
- Standard Diagnostic Evaluation done prior to OMT
- Used a range of OMT techniques aimed at the lumbosacral, iliac, & pubic areas (15 mins)
- Sham OMT= hand contact, AROM, PROM, light touch, misdirected movements, & diminished force applied to the same regions (15 mins)
- UST & Sham UST (subtherapeutic intensity) applied to the low back
The OSTEOPATHIC Trial - 2013

• Primary Outcomes:
  • Used a 100mm visual analog pain scale measured just prior to OMT/Sham
    OMT & at week 12
  • Looked for moderate improvement (30% or greater) or Substantial
    improvement (50% or greater)

• Results:
  • Significant reduction in pain scores for OMT vs. sham OMT (p=0.002), but
    not for UST vs. sham UST (p=0.99)
  At Week 12
    OMT     Sham OMT
    Moderate improvement obtained 63% 46%
    Substantial improvement obtained 50% 35%

Table 3. Secondary Outcomes by Main Effects Group

<table>
<thead>
<tr>
<th>Outcome</th>
<th>OMT vs Sham OMT</th>
<th>UST vs Sham UST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use 1 or more roid (in past 4 weeks)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 12</td>
<td>0 (0-12)</td>
<td>0 (0-12)</td>
</tr>
<tr>
<td>Week 12</td>
<td>0 (0-12)</td>
<td>0 (0-12)</td>
</tr>
</tbody>
</table>

Shoulder Pain & Dysfunction
### Improving Functional Ability in Elderly with Spencer Technique - 2002

- **N=29**
- **2 groups**
  - Spencer technique (w/ Muscle Energy - ME)
  - Supposedly SHAM Spencer technique (regular Spencer technique)
- **Treatment done at weeks 1, 3, 5, 7, 11, & 15**
- **Primary Outcomes:**
  - Modified physical functioning scale: dressing, bathing, and grooming
  - Shoulder Range of Motion (goniometer)
  - Pain level (0-10 scale)
  - Assessed at entry (week 0), then 1 week s/p each treatment, & then at week 19
- **Results:**
  - 1 week s/p last treatment, both groups had improvement of ROM & decreased pain (p<0.01)
  - Week 19, showed a trend towards reversal of ROM improvement in the sham group, while the treatment group continued to have improvement of ROM
  - Week 19, showed trend towards increase in pain level in both groups

### Manipulative therapy (MT) for shoulder pain and disorders: expansion of a systematic review - 2011

- **Authors=Chiropractors**
- **Searched for any manual therapy (chiropractic, osteopathic, PT)**
- **Out of 211 citations, 35 deemed useful**
- **Used Physiotherapy Evidence Database Scale**
  - A= good evidence
  - B= fair evidence
  - C= limited evidence
  - I= Insufficient evidence
- **Results**
  - MT applied to the shoulder, shoulder girdle, &/or Full Kinetic Chain (+/- exercise, +/- multi-modal approach) is helpful for a variety of common rotator cuff disorders, shoulder disorders, adhesive capsulitis, & ST disorders. **B (except for OA of shoulder= I)**
  - MT applied to the shoulder, shoulder girdle, &/or Full Kinetic Chain (+/- exercise, +/- multi-modal approach) is helpful for peripheral nerve injuries/entrapment. **C**

### Pain in Spinal Cord Injured Patients
OMT for Spinal Cord Injury-Associated Pain Control-2011

- N=26 + 21 (18-60yo w/ traumatic SCI between C5-L5 that had been stable for 6 months)
- Started with 2 groups (N=26)
  - Os: Anti-depressant + OMT (MFR, ST, SCS, ME, & Cranial-Sacral) (7 OMT sessions/3 months)
  - Ph: Anti-depressant + pharmacologic pain management (pregabalin 600mg/day or paracetamol 2-4g/day)
- Primary Outcomes:
  - Pain Intensity (0-10 verbal numeric scale)

Results:
- From 0-3 weeks: Ph group was having a more rapid reduction in pain than Os group
- From 0-8 weeks: there was a statistical difference between the Ph & Os groups

Results Cont.
- Only PhO group had further statistically significant change in pain score (from T5-T8)

Table 3: Comparison of the three groups per each time interval

<table>
<thead>
<tr>
<th>Time interval</th>
<th>Ph vs Os</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0 vs T1</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>T1 vs T2</td>
<td>&gt;0.05</td>
<td></td>
</tr>
<tr>
<td>T2 vs T3</td>
<td>&lt;0.05</td>
<td></td>
</tr>
</tbody>
</table>

Table 6: VNS scores from T5 to T8

<table>
<thead>
<tr>
<th>Time (weeks)</th>
<th>Ph mean ± SD</th>
<th>Os mean ± SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>5.60 ± 1.07</td>
<td>5.63 ± 0.75</td>
<td>0.72</td>
</tr>
<tr>
<td>16</td>
<td>5.40 ± 1.07</td>
<td>5.63 ± 0.75</td>
<td>0.72</td>
</tr>
<tr>
<td>19</td>
<td>5.49 ± 1.07</td>
<td>5.43 ± 1.04</td>
<td>0.22</td>
</tr>
<tr>
<td>22</td>
<td>5.43 ± 1.04</td>
<td>5.43 ± 1.04</td>
<td>0.98</td>
</tr>
<tr>
<td>25</td>
<td>5.37 ± 1.00</td>
<td>5.50 ± 0.99</td>
<td>0.38</td>
</tr>
<tr>
<td>28</td>
<td>5.37 ± 1.00</td>
<td>5.50 ± 0.99</td>
<td>0.38</td>
</tr>
<tr>
<td>31</td>
<td>5.43 ± 1.04</td>
<td>5.50 ± 0.99</td>
<td>0.38</td>
</tr>
<tr>
<td>34</td>
<td>5.43 ± 1.04</td>
<td>5.50 ± 0.99</td>
<td>0.38</td>
</tr>
</tbody>
</table>
Pain Control in Post-operative Care

Pre-op Morphine Sulfate & Post-op OMT: Analgesic Use s/p Total Abdominal Hysterectomy 2005

Figure 1: Over 24 hours after surgery (6 h to 24 h): total postoperative dose of morphine sulfate (mg/dl). Values presented are median with 25% confidence interval.

Figure 2: Second 24 hours after surgery (24-48 h): total postoperative dose of morphine sulfate (mg/dl). Values presented are median with 25% confidence interval.
Do patients with postoperative ileus that receive OMT have improved outcomes?- 2009

- Retrospective Chart Review
  - 331 patients met inclusion criteria and had undergone abdominal surgery
  - 172 received OMT
  - 139 did not receive OMT
- Patients who received OMT had statistically significant shorter hospital stays (11.8 vs. 14.6 days; \( P = .029 \)).
Post-Op Ileus/Intraperitoneal protein and inflammation

- In the Rat Model study, revealed that abdominal visceral massage resulted in decreased total intraperitoneal protein and numbers of intraperitoneal inflammatory cells in the ST group compared to the SNT group (P<0.05).

- Mouse-model study published in the World Journal of Surgery in 2005 "concluded that both inhibition of inflammation and increased gastrointestinal motility during the early postoperative period have a positive effect on decreasing the formation of adhesions."

- Hence, Post-op abdominal manipulation should theoretically reduce the incidence of post-op ileus as well as adhesions.
Post-Op Ileus Prevention

Postoperative Adynamic Ileus: Its Prevention and Treatment by Osteopathic Manipulation. The DO. 1965:163-4

- 317 patients received routine OMM s/p surgery
  - 0.3% developed ileus

- 92 patients did not receive OMM
  - 7.6% developed ileus

Pneumonia in Hospitalized Elderly Patients

Efficacy of osteopathic manipulation as an adjunctive treatment for hospitalized elderly patients with pneumonia (MOPSE trial)-2010

- N= 387
- 3 groups:
  - Conventional Care Only (CCO)
  - OMT
  - Light touch
- Primary Outcomes:
  - Length of Stay (LOS)
  - Time to Clinical Stability
MOPSE Trial-2010

<table>
<thead>
<tr>
<th>Primary Outcomes</th>
<th>OMT</th>
<th>LT</th>
<th>CCO</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Length of Stay (days)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITT Analysis mean (SD)</td>
<td>91 (135)</td>
<td>91 (126)</td>
<td>113 (108)</td>
<td>0.12</td>
</tr>
<tr>
<td>ITT Analysis median (IQR)</td>
<td>39 (38-41)</td>
<td>43 (24-69)</td>
<td>43 (38-49)</td>
<td>0.03</td>
</tr>
<tr>
<td>ITT Analysis mean (SD)</td>
<td>6.5 (2.7)</td>
<td>6.9 (2.7)</td>
<td>7.3 (2.9)</td>
<td>0.26</td>
</tr>
<tr>
<td>ITT Analysis median (IQR)</td>
<td>4.0 (4.2)</td>
<td>4.4 (4.6)</td>
<td>5.2 (4.9)</td>
<td>0.06</td>
</tr>
<tr>
<td>ITT Analysis time to clinical stability</td>
<td>30 (125)</td>
<td>39 (98)</td>
<td>113 (126)</td>
<td>0.09</td>
</tr>
<tr>
<td>ITT Analysis mean (SD)</td>
<td>2.5 (1.4)</td>
<td>2.5 (1.4)</td>
<td>2.6 (1.4)</td>
<td>0.77</td>
</tr>
<tr>
<td>ITT Analysis median (IQR)</td>
<td>20 (20-20)</td>
<td>20 (20-20)</td>
<td>20 (20-20)</td>
<td>0.97</td>
</tr>
</tbody>
</table>

Durability Analysis

<table>
<thead>
<tr>
<th>Duration of Intensive Antibiotic Use (days)</th>
<th>MOPSE Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITT Analysis mean (SD)</td>
<td>91 (135)</td>
</tr>
<tr>
<td>ITT Analysis median (IQR)</td>
<td>39 (38-41)</td>
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<tr>
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<tr>
<td>ITT Analysis median (IQR)</td>
<td>4.0 (4.2)</td>
</tr>
</tbody>
</table>

Benefits of Osteopathic manipulative treatment for hospitalized elderly patients with pneumonia-2000

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Treatment group</th>
<th>Control group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of stay, d</td>
<td>8.8±2.0</td>
<td>8.8±2.0</td>
<td>0.14</td>
</tr>
</tbody>
</table>

*Data were analyzed using one-way analysis of variance and are presented as mean ± SD. Duration of antibiotic therapy and length of stay were measured in days.
Post-Operative Pulmonary Complications-1963

1031 surgical patients evaluate for Somatic Dysfunction (SD) at C3-C5
- 109 had SD at C3-C5 (10.6%)
- 109 split into 2 groups:
  - OMT group= (75) received OMT to correct the C3-C5 dysfunction(s) prior to surgery
  - No OMT group= (34) did not have their C3-C5 dysfunction(s) corrected

Results:
- Of all the 1031 surgical patients evaluated:
  - 3.1% rate of post-op pulmonary complications
- No OMT group:
  - 85.3% rate of post-op pulmonary complications
- OMT group:
  - 5.3% rate of post-op pulmonary complications

Pediatric Acute Otitis Media

- N= 57 (6mm-6yo w/ hx of 3 AOM/6mm or 4AOM/1yr)
- 2 groups:
  - Routine pediatric care
  - Routine pediatric care + OMT

Outcomes:
- Incidence of AOM
- Antibiotic use
- Surgical intervention
- Tympanometric & audiometric performance
- Behaviors

OMT as Adjuvant Therapy in Children with Recurrent Acute Otitis Media- 2003

- N= 57 (6mm-6yo w/ hx of 3 AOM/6mm or 4AOM/1yr)
- 2 groups:
  - Routine pediatric care
  - Routine pediatric care + OMT
- Outcomes:
  - Incidence of AOM
  - Antibiotic use
  - Surgical intervention
  - Tympanometric & audiometric performance
  - Behaviors
OMT as Adjuvant Therapy in Children with Recurrent Acute Otitis Media- 2003

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention, Mean ± SD</th>
<th>Control, Mean ± SD</th>
<th>Group Difference, Mean Difference (Confidence Interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in number of episodes of acute otitis media over the study</td>
<td>0.14 ± 0.21</td>
<td>0.32 ± 0.26</td>
<td>-0.18 (-0.38 to 0.02)</td>
</tr>
<tr>
<td>Change in number of episodes of acute otitis media during the study</td>
<td>0.03 ± 0.26</td>
<td>0.62 ± 0.47</td>
<td>-0.59 (-0.79 to -0.39)</td>
</tr>
<tr>
<td>Length of stay in hospital (days)</td>
<td>6.60 ± 1.80</td>
<td>5.28 ± 1.36</td>
<td>1.32 (0.78 to 1.86)</td>
</tr>
</tbody>
</table>

• Journal: Medicine
• Comprehensive database search from journal inception (1922) to May 2015 for quasi-RCTS that treated preterm infants in the crib or bed with OMT by Osteopaths.

OMT for Premature Infants: Systematic Review & Meta-analysis- 2017

• Journal: Medicine
• Comprehensive database search from journal inception (1922) to May 2015 for quasi-RCTS that treated preterm infants in the crib or bed with OMT by Osteopaths.

• Results:
  • 5 studies (1306 infants) met inclusion criteria

Premature Infants in NICU
### OMT for Premature Infants: Systematic Review & Meta-analysis- 2017

<table>
<thead>
<tr>
<th>Outcome</th>
<th>No. of studies included in the meta-analysis</th>
<th>Outcome of OMT on preterm infants versus usual care group (OR/CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth (days)</td>
<td>2 (91)</td>
<td>Decrease in days treated by OMT to 171 (p&lt;0.05)</td>
</tr>
<tr>
<td>Birth group: LGD (days) &lt;16 weeks</td>
<td>2 (70)</td>
<td>Decrease in days treated in the OMT group to 191 (p&lt;0.05)</td>
</tr>
<tr>
<td>Birth group: LGD (days) &gt;16 - &lt;23 weeks</td>
<td>2 (711)</td>
<td>Studies in infants treated to OMT group (p&lt;0.05)</td>
</tr>
<tr>
<td>Birth group: LGD (days) &gt;23 - &lt;37 weeks</td>
<td>3 (711)</td>
<td>Randomized control trial treated by OMT (p&lt;0.05)</td>
</tr>
<tr>
<td>Birth group: LGD (days) &gt;37 weeks</td>
<td>3 (711)</td>
<td>Controls or non-patient treated by OMT (p&lt;0.05)</td>
</tr>
</tbody>
</table>

### OMT Safety

- **Stratification of Potential Complications**
  - Dire
    - Ex. death, spinal injury, cerebrovascular accident
  - Serious
    - Ex. fracture, dislocation, dissemination of infection or neoplasm, significant aggravation of pain or disability
  - Less consequential
    - Ex. local discomfort, numbness/tingling, headache, dizziness/light-headedness
  - HVLA has been shown to be associated with dire or serious issues

### Random Manual Sham

- Would not involve/incorporate knowledge of Osteopathic Principles and Practice or Osteopathic Manipulative Medicine
- Could be given by students or anyone with an appropriate license to place their hands on a patient

**Example**

- **OMT group** = DO administers
  - Directed at pertinent areas
  - 15-20 minute session

- **Sham group** = DO, or student or other
  - Randomized Sham protocol
  - Light touch or Soft Tissue or placebo ultrasound
  - 15-20 minute session
Online Search for OMT/OMM Studies

Source: VCOM Library Advanced Search of World-Wide Libraries
In English, peer-reviewed articles
In Title: “Osteopathic Manipulation” or “Osteopathic Manipulative”

2009-2014= 65 articles
2014-2019= 285 articles

AOA- Bureau of Clinical Education and Research

Five Research Focus Areas
- Chronic Diseases & Conditions
- Osteopathic Philosophy
- Musculoskeletal Injuries & Prevention
- Impact of OMM & OMT
- Pain Management

AOA’s Role (Convener of Research)

Other Collaborations

Grant Making (AOA Sponsored, Sponsored by Others, & Co-Funded)

Securing Grants (Connection to Opportunities & Lead on Grants)

AOA as the Funder of Research

<table>
<thead>
<tr>
<th>Grant Categories</th>
<th>FY16</th>
<th>FY17</th>
<th>FY18</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMM/OMT</td>
<td>4</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Musculoskeletal Inj. &amp; Prev.</td>
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<td>1</td>
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<tr>
<td>Pain Management</td>
<td>2</td>
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<tr>
<td>Chronic Disease</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Osteopathic Philosophy</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Student Grant</td>
<td>4</td>
<td></td>
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<tr>
<td>Physicians in Training Grant</td>
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</tr>
<tr>
<td>Total # of Grants</td>
<td>9</td>
<td>8</td>
<td>13</td>
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</tbody>
</table>

AOA Research Funding

<table>
<thead>
<tr>
<th>Year</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to FY16</td>
<td>$1,600,000</td>
</tr>
<tr>
<td>FY16</td>
<td>$1,200,000</td>
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<td>FY17</td>
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<tr>
<td>FY18</td>
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[VALUE] $1,040,182
[VALUE] $1,098,409
[VALUE] $1,390,961
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[VALUE] $800,000
[VALUE] $1,000,000
[VALUE] $1,200,000
[VALUE] $1,400,000
[VALUE] $1,600,000
NIH Awards to Osteopathic Institutions (2009-18)

180% Increase in NIH Funding to Osteopathic Institutions over the last 10 years

NIH Projects Awarded to Osteopathic Institutions by Institute/Center (2018)

60 Total Grants totaling $28.3 million awarded to Osteopathic Institutions

OMT/OMM Research Funding & Ways to Get Involved

- Reach out to:
  - AOA & JAOA
  - AAO & AAOJ
  - FORCE
  - Practice-Based Research Networks
  - DO-Touch.net
  - Consortium for Collaborative Osteopathic Research Development
  - COMs
  - NIH
References

- Checkoway H, et. Al. Selecting appropriate study designs to address specific research questions in occupational epidemiology. Occup Environ Med. 2007 Sep; 64(9): 633–638.
- Empirically, the OMT-PROMS protocol has been shown to improve the quality of life for patients with chronic low back pain. J Neurosurg. 2018 Dec.