

# Osteopathic Manipulative Treatment Use in the Emergency Department: A Retrospective Medical Record Review

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**Context:** Although the use of osteopathic manipulative treatment (OMT) appears to be declining, data on the use of OMT in the emergency department (ED) are not available.

**Objective:** To determine the quantity and characteristics of OMT performed in a single, community academic ED that houses an osteopathic emergency medicine residency.

**Design:** Retrospective medical record review.

**Setting:** A single large community academic ED with an osteopathic emergency medicine residency from July 14, 2005, to March 4, 2013.

**Participants:** Patients in the ED who received OMT (N=2076).

**Main Outcome Measures:** Medical record data were analyzed to determine patient demographics; treatment characteristics including number of procedures and patients per physician, OMT techniques used, night vs day procedure variation, and financial implication of future billing for OMT; chief complaints; primary discharge diagnoses; and length of stay in the ED.

**Results:** Patients were aged 0 to 95 years (mean, 39 years) and were predominately female (1260 [60.69%]) and white (1300 [62.62%]). A mean of 0.74 patients received OMT per day, and a mean of 29.65 procedures were performed per physician. When data for residents were looked at separately, the mean was higher at 40.32 procedures per physician. The top 3 discharge diagnoses were low back pain (189 patients [9.10%]), muscle spasm (106 patients [5.11%]), and spasm: muscle, back (93 patients [4.48%]). Eleven different OMT techniques were recorded, with myofascial release being used most frequently (1150 of 2868 procedures [40.09%]), followed by muscle energy (672 [23.43%]). The average length of stay in the ED was 206 minutes. A total of 1663 OMT procedures (80%) were performed during the day, whereas 413 (20%) were performed at night. Potential procedural billing for all OMT performed during the study period was \$33.09 per day.

**Conclusion:** In contrast to perceptions that OMT use is declining, the authors found that OMT is being performed on a near daily basis in the ED. Additional research is needed to fully understand the impact of OMT in the ED.

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Osteopathic medicine was first formally taught in the United States in 1892.<sup>1</sup> Since that time, osteopathic physicians (ie, DOs) have practiced osteopathic manipulative medicine (OMM) and osteopathic manipulative treatment (OMT) in all specialties of medicine. A survey of DOs' practice patterns<sup>2</sup> indicates OMT use may be declining, however, despite the steady growth of osteopathic medical schools<sup>3</sup> and DO graduates,<sup>4</sup> as well as substantial support for OMT by our allopathic peers, the government, and the public.<sup>6,10</sup>

Emergency medicine DOs in particular face challenges to using OMT given the nature of their patients and their patients' visit urgency. Common barriers to the use of OMT include physician disinterest, perceived time constraints, concern for inadequate skill, and unclear compensation.<sup>5</sup> Still, OMT has a place in emergency medicine, and osteopathic emergency physicians are uniquely qualified to provide this specialized care.<sup>11-13</sup> Research<sup>3,5</sup> has demonstrated the benefits of OMT for acute musculoskeletal complaints, which account for 13.8% of emergency department (ED) visits.<sup>9</sup> Likewise, the Agency for Health Care Policy and Research of the United States Public Health Service suggests that spinal manipulation is among the "safest methods" for relieving spinal discomfort.<sup>6</sup> Despite these demonstrated benefits, rates of OMT use in the ED appear to be low.<sup>7,8</sup> In 2004, approximately 28% of osteopathic emergency physicians surveyed reported that they use OMT weekly or daily.<sup>2</sup>

Although perceptions of OMT use in the ED indicate that OMT is underused,<sup>2</sup> data on the actual number of OMT applications performed in the ED have not been reported. The American College of Osteopathic Emergency Physicians guidelines mandate that "programs must integrate OMM and its application (OMT) in the practice of emergency medicine."<sup>12</sup> However, neither the American College of Osteopathic Emergency Physicians nor the American Osteopathic Association quantify the number of procedures for competency as is done with other commonly performed ED procedures.<sup>12,13</sup>

To assess the quantity and characteristics of OMT performed by osteopathic emergency physicians, we performed a retrospective medical record review in a community-based ED that houses a 4-year osteopathic emergency medicine residency. We hypothesized that despite the pressures of a busy ED and any logistical challenges or perceived barriers, osteopathic emergency physicians are performing a meaningful amount of OMT. To our knowledge, our study is the first to quantify the use of OMT performed and the demographics of the patients receiving OMT in the ED.

## Methods

We performed a retrospective medical record review of ED patients who received OMT between July 14, 2005, and March 4, 2013, at Good Samaritan Hospital Medical Center Emergency Department in West Islip, New York. The study was deemed exempt from institutional review board approval.

Electronic medical record data were collected from Allscripts ED, a computerized patient record and order entry system used by the hospital. Cognos Impromptu software (IBM Corp) was used to extract data from records that met the inclusion criteria. The data were further analyzed using Excel 2007 (Microsoft Corp).

The items retrieved by Cognos and then exported to Excel included the following: OMT procedure name, physician identification number, patient age, patient sex, treatment technique, patient ethnicity, ED length of stay (LOS) in minutes, chief complaint, and primary discharge diagnosis. The data were then analyzed to identify characteristics of the patient population, treatment, and presentation and discharge records.

Patient characteristic data included sex, age, and ethnicity. Specific data on treatment included total number of OMT procedures performed, mean number of OMT procedures per physician, mean and median number of patients treated per physician, median number of patients treated per emergency medicine resident (regardless

of training level or time in the ED), OMT techniques used, day vs night procedure variation (day, 7 AM-7 PM; night, 7 PM-7 AM), and financial implication of billing for OMT. Because billing for OMT was not practiced at the hospital during the study period, the financial implication of OMT was estimated using the assumption that each procedure could have been billed with a Current Procedural Terminology code for the treatment of 1 to 2 body regions (98925) at the published Medicare rate of \$44.81 (relative value unit of 0.46).<sup>14,15</sup> Presentation and discharge record data included number of chief complaints, most common chief complaints, number of primary discharge diagnoses, most common discharge diagnoses, and ED LOS.

## Results

Medical records for 2076 patients met the inclusion criteria and were included in the analysis. Patient demographic information is presented in *Table 1*. A total of 2868 OMT procedures were performed by 70 osteopathic emergency physicians during the study period of 2811 days (7.7 years). A mean of 1.02 OMT procedures were performed per day, and a mean of 0.74 patients received OMT per day. Whereas the mean number of procedures per physician was 29.65 (median, 15; range, 1-206), this number increased to 40.32 (median, 78; range, 1-206) when the data were analyzed for residents only.

Of the 11 different OMT techniques recorded, myofascial release was the most frequently used (1150 [40.1%]), followed by muscle energy (672 [23.43%]) (*Table 2*). The mean LOS in the ED for patients who received OMT was 206 minutes. A total of 1663 OMT procedures (80%) occurred during the day and 413 (20%) occurred at night. When each of the patients treated was retrospectively assigned a Current Procedural Terminology code associated with the monetary value for treatment of 1 to 2 body regions, daily billing would have been \$33.09 per day.

**Table 1.** Demographic Characteristics of Emergency Department Patients Who Received Osteopathic Manipulative Treatment (N=2076)

Characteristic	No. (%) <sup>a</sup>
Age, y, mean (range)	39 (0-95) <sup>b</sup>
<b>Sex</b>	
Male	816 (39.30)
Female	1260 (60.69)
<b>Race/Ethnicity</b>	
Asian	5 (0.24)
Black	391 (18.83)
Other	368 (17.73)
Unknown	12 (0.58)
White	1300 (62.62)

<sup>a</sup> Data presented as No. (%) unless otherwise indicated.

<sup>b</sup> Median, 39 y.

A total of 142 different chief complaints and 409 discharge diagnoses were documented, with back pain (all cause) being the most common complaint (571 [27.50%]) and low back pain being the most common discharge diagnosis (189 [9.10%]) (*Table 3*).

## Discussion

Our findings indicated that approximately 1 OMT procedure was performed and 0.73 persons received OMT per day in our ED. Although these numbers may seem low, it indicates a trend of OMT use in the ED.

It is unclear as to how many physicians were present in the ED at any given time; however, our finding that 70 physicians performed OMT during the study period is notable. In addition, we found that approximately 30 procedures were performed per physician, which shows that even though DOs might not perform OMT daily, they still feel comfortable using OMT. Further, even in an academic setting where residents perform the

majority of procedures, each attending physician provided OMT to approximately 11 patients, indicating that they still find the value in performing OMT.

Of note, the AllScripts documentation analyzed was inconsistent in the way each procedure was logged. In addition, not all records contained complete documentation. Therefore, it is possible that the number of OMT procedures performed in our ED were underreported. Osteopathic physicians often perform small or short treatments as part of their diagnostic process, and in these cases, DOs often feel that the treatments do not warrant documentation or billing.<sup>16</sup> This phenomenon has been previously documented in a survey of DOs.<sup>16</sup> This practice is especially likely in a setting such as our ED, where OMT is not billed for or quantified.

With the current data set, we do not have the ability to determine the number of hours that each physician worked vs the number of procedures that each physician performed. The day vs night variance of shifts, as well as the total opportunities to use OMT based on the type of patient, could greatly affect the number of procedures performed. Future attempts to account for the number of procedures per physician and per hour of work in addition to a more standardized method of documentation could provide greater and more detailed understanding of the character and quantity of OMT procedures performed.

We noted a large age range in the patients treated. It is understandable that both the median and mean were found in younger ages, as elderly patients seen in the ED often have more complex presentations (eg, multiple comorbidities, limited medical history) and may be less likely to receive OMT.

Our study revealed a great variety of diagnoses (409) in ED patients receiving OMT, with 11 different OMT techniques used in the care of these patients by DOs. Although it is encouraging that a variety of techniques were used by the physicians in our study, it reflects only a portion of the 28 techniques listed in the

**Table 2.**  
**Osteopathic Manipulative Treatment Techniques Used in the Emergency Department<sup>a</sup>**

Technique	No. (%) <sup>a</sup>
Balanced Ligamentous Tension	261 (9.10)
Counterstrain	213 (7.42)
Facilitated Positional Release	86 (2.99)
High-Velocity, Low-Amplitude	185 (6.45)
Lymphatic Pump	80 (2.78)
Muscle Energy	672 (23.43)
Myofascial Release	1150 (40.09)
Myofascial Unwinding	97 (3.38)
Osteopathic Cranial Manipulative Medicine	34 (1.18)
Trigger Point	62 (2.16)
Visceral Manipulation	25 (0.87)

<sup>a</sup> A total of 2868 procedures were performed on 2076 patients during the study period (2005-2013).

*Glossary of Osteopathic Terminology.*<sup>18</sup> It is important to note that our OMT documentation template contained only 11 treatment types. It is possible that more were used; however, documentation entered in the free text note section of the medical records was not captured in the present study.

Our finding of myofascial release and muscle energy as the most common OMT techniques used partially contrasts with previously reported findings of soft tissue and myofascial release as the most commonly performed techniques.<sup>16</sup> Although no definitive explanation exists in the literature regarding why certain techniques are performed over others, we believe that in our study, certain procedures were more common because of the nature of the ED setting.<sup>17</sup> For example, myofascial release is an ideal modality for the ED because it is a passive technique: patients do their best to relax and are likely comforted by the additional time that the DO is spending at their bedside. Likewise, muscle energy is a direct and

**Table 3.**  
**Chief Complaints and Discharge Diagnoses of**  
**Emergency Department Patients Who Received**  
**Osteopathic Manipulative Treatment (N=2076)**

Medical Record Finding	No. (%) <sup>a</sup>
<b>Chief Complaint</b>	
Types of chief complaints, No.	142
Top 3 chief complaints	
Back pain (all cause)	571 (27.50)
Motor vehicle collision	254 (0.23)
Neck pain (all cause)	187 (9.00)
<b>Primary Final Discharge Diagnosis</b>	
Types of primary final discharge diagnoses, No.	409
Top 3 diagnoses	
Low back pain	189 (9.10)
Muscle spasms	106 (5.11)
Spasms: muscle, back	93 (4.48)
Top 3 regions of diagnoses	
Back	632 (30.44)
Neck	252 (12.14)
Head	141 (6.79)

<sup>a</sup> Data presented as No. (%) unless otherwise indicated.

active technique in which patients are able to engage and participate in their care to aid in their recovery. Other factors such as physician demographics<sup>17</sup> and differences in training could also account for variance in treatment type preference. Future studies are needed to determine whether these factors affect physician treatment preference.

Our mean LOS of 206 minutes for patients treated with OMT was substantially less than the weighted mean published LOS of 273 minutes<sup>19</sup> and our own ED's 2013 mean of 229 minutes. These numbers demonstrate that efficiency was not negatively affected in the cases in which physicians chose to use OMT (con-

trary to what some may fear) and that appropriate OMT use may effectively improve LOS, although more research is needed in that area.

We found that the theoretical daily billing for the OMT performed in the study was approximately \$33 per day. Although \$33 per day may seem relatively insignificant, it represents a much larger missed revenue opportunity and raises questions regarding the total cost of health care and how health care dollars should be spent on a greater scale. Osteopathic manipulative treatment has been shown to decrease medication use, decrease hospital LOS, and minimize loss of productivity resulting from low back pain.<sup>8,17-23</sup> Therefore, by using OMT more frequently, patients may return to work sooner with less loss of productivity and medication use, thereby increasing the cost effectiveness of OMT performed in the ED.<sup>24</sup> Encouraging OMT use when appropriate in the ED and billing for it accordingly has the potential to increase ED billing while simultaneously reducing the overall cost of health care for patients.<sup>24</sup>

The primary limitation of the current study was that it was a retrospective convenience sample of patients from a single ED. Additionally, residents in this program had a variety of requirements for OMT as part of their residency training standards. However, no specific number of procedures was needed to achieve competency or to fulfill graduation requirements. Future studies are needed to determine the impact of OMT use specifically regarding patient satisfaction, patient selection, patient response to OMT, and patient perception of treatment and satisfaction thereof.

## Conclusion

Osteopathic manipulative treatment has an active presence in the ED and is being incorporated by DOs in the treatment of patients of nearly all ages, sexes, and races, via myriad techniques. Additional research is needed to truly understand the impact of OMT in the ED.

## Author Contributions

Dr Ault provided substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; Drs Ault and Levy drafted the article or revised it critically for important intellectual content; Drs Ault and Levy gave final approval of the version of the article to be published; and Dr Ault agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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