

Decline in structural examination compliance in the hospital medical record with advancing level of training

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A retrospective review of 115 randomly pulled hospital charts of patients admitted to the care of osteopathic physicians at an American Osteopathic Association-accredited primary care hospital revealed a significant decline in the frequency of structural examinations in history and physical examinations during a merger and relocation, as well as with increasing level of training of the examiner (χ^2 test, $P < .001$). Attending physicians completed fewer structural examinations (45% of their history and physical examinations) compared to house staff (70%) and students (92%). A follow-up anonymous survey of 100 osteopathic physicians and students (response rate, 58%) revealed that the low overall frequency of structural examination completion (60%) was due primarily to attending physicians who considered this examination less relevant or impractical for their hospitalized patients. These results indicate that education on relevance of structural examination and manipulative treatment for acutely ill patients needs to be directed not only to house staff and students but also to attending physicians to preserve and improve the use of osteopathic principles at osteopathic hospitals.

(Key words: structural examination, history and physical examination)

The structural examination is a required component of the history and physical examination (H&P) at all hospitals accredited by the American Osteopathic Association (AOA).¹ Several studies have evaluated structural findings in hospitalized patients²⁻⁴ and osteopathic manipulative treatment in the hospital.⁵⁻⁷ Two recent multicenter studies assessed compliance with AOA requirements for

structural examination. Seventy-eight percent of 532 charts in one of these studies and 80% of 273 charts in the other documented any sort of structural examination or musculoskeletal findings in H&Ps completed by osteopathic medical students or interns.^{8,9} It has been our experience as members of the Utilization of Osteopathic Concepts (UOC) committees at four different training hospitals that a much lower percentage of charts document structural examinations.¹⁰ The main objective of this study was to quantify this observation at one such hospital and, if substantiated, to determine reasons for lack of documentation of structural examinations at the hospital.

The multicenter studies previously cited also found that for charts with abnormal results of structural examinations, a somatic dysfunction diagnosis

was listed in the H&P problem list only 4%⁸ and 0.8%⁹ of the time (percentages extrapolated from data). This omission could be construed as a deviation from the AOA compliance requirements for the structural examination. Specifically, the AOA guidelines for performing the structural examination on inpatients were amended in 1994 to read as follows¹:

■ The examination should be conducted by osteopathic physicians and shall be carried out in two or more positions, unless this is precluded by the patient's condition.

■ The examination should include inspection, palpation, segmental motion testing, and overall motion testing of the major areas of the spine, cranium, thoracic cage, and pelvis. Major (pertinent) findings of the extremities should be included.

■ Mention should be made of antero-posterior spinal curves, any lateral curves, areas of tenderness, Jones' tender points, muscle contracture, and other soft tissue changes, spasm, and limited range of motion.

■ The report of the examination shall be in a form which details positive and negative findings.

■ If the structural examination is not performed at least referable to the area of chief complaint, this shall be noted and the reason stipulated.

■ A correlation shall be made between the patient's structural abnormalities and chief complaint.

This last guideline implies but does not mandate that when abnormalities are identified in the structural examination, a somatic dysfunction diagnosis should be recorded in the assessment or problem list—and it should be related to the primary reason for hospitalization if relevant.

The objectives of the present study are the following: (1) to assess the frequency of structural examinations in the hospital H&P for inpatients admitted to the care of osteopathic physicians at Capital Region Medical Center (CRMC); (2) to assess the frequency of documentation of a somatic dysfunction diagnosis when abnormalities are identified in the structural examination; and (3) to determine the reasons for the presence or absence of

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the structural examination and the somatic dysfunction diagnosis. We hypothesize that the perceived decrease in use of the structural examination at CRMC compared to previous studies is due to more H&Ps being performed by attending physicians at this hospital. The null hypothesis is that there is no difference in the frequency of completing structural examinations in H&Ps performed by osteopathic attending physicians, house staff, and students.

Study design

A retrospective review of 10 patient charts per month was completed by the UOC Committee at CRMC from August 1995 through June 1996. Charts were randomly selected by the medical records personnel from signature piles of the previous month's hospital discharges, excluding obstetric care (because of the abbreviated H&P with admission for delivery). Five pulled charts of patients who had allopathic attending physicians were excluded, for a total of 115 charts reviewed.

For each chart, the H&P was evaluated for the presence or absence of any structural examination component. Charts that had some aspect of a structural examination were further evaluated with regard to whether the examination was sufficient, whether the examination had abnormal findings, and whether a somatic dysfunction diagnosis was recorded if abnormal findings were present. The structural examination was rated as sufficient if it was performed in two or more positions, or one position if a reason for doing so was documented, and if it included each of three components at least referable to the chief complaint—inspection, palpation, and motion testing. Charts with a documented reason for deferral of the structural examination were also accepted as sufficient. The form used to collect data from each chart is provided in Figure 1. It should be noted that the previously referenced multicenter studies^{8,9} used data comparable to those judged insufficient in the present study.

The H&Ps that had abnormal structural examination findings were further evaluated for the presence or absence of

MEDICAL RECORD # _____ ADMITTANCE DATE _____	
ATTENDING PHYSICIAN _____	
HISTORY AND PHYSICAL EXAMINATION PERFORMED BY _____	
(1) Was a structural examination performed?	Yes _____ No _____
(1a) If no, was a reason for deferred examination documented?	Yes _____ No _____
(2) Was the same examination performed in TWO OR MORE POSITIONS, OR was a reason for only one position documented?	Yes _____ No _____
(3–5) Were the following examinations included?	
(3) INSPECTION for asymmetry	Yes _____ No _____
(4) PALPATION	Yes _____ No _____
(5) MOTION TESTING	Yes _____ No _____
(6) If abnormal findings, was a somatic dysfunction diagnosis listed in the assessment?	Yes _____ No _____
(7) Was the structural examination sufficient? (Criteria: "Yes" on question 1a or on questions 2 through 5)	Yes _____ No _____
Recommendations: _____	

Reviewing Physician Number: _____ Date: _____	
Chart Deferred	_____
Examination Not Performed	_____
Examination Sufficient	_____
Examination Insufficient	_____

Figure 1. Structural examination evaluation form for the chart review.

a somatic dysfunction diagnosis in the problem list or assessment. All data were collected by osteopathic physician members of the UOC Committee, none of whom evaluated their own patient charts.

To further delineate reasons for compliance with AOA structural examination requirements, or lack thereof, a questionnaire was developed by the UOC Committee (Figure 2). This survey was mailed to 70 osteopathic physician members of the CRMC staff and hand-delivered to 30 osteopathic residents, interns,

and students on rotation at CRMC. Completed forms were returned anonymously to the medical staff office. An affective outlier statement was included in the response list to question 3. Respondents checking "OMT bad for patients" were excluded from data analysis to prevent emotionally negative responses from confounding the data.

All data for the chart review and questionnaire components of the study were anonymously compiled by the chairperson of the UOC Committee, and statis-

Structural Examination Questionnaire (response confidential)

Check one:

☐ Attending Specialty: _____
☐ Resident
☐ Intern
☐ Student D.O.

(1) Do you routinely perform history and physical examinations on hospitalized patients?

☐ Yes. **Go on to question 2.**
☐ No. **Skip remaining questions, return form.**

(2) Do you routinely perform an osteopathic structural examination in your hospital history and physical examinations?

☐ Yes. **Go on to question 4.**
☐ No. **Go on to question 3.**

(3) Check all of the following reasons for which you do not routinely perform structural examinations on hospitalized patients:

☐ Inadequate training	☐ Examination not relevant
☐ Examination skills forgotten	☐ OMT unproven
☐ Not enough time	☐ OMT not reimbursed
☐ Forget to do examination	☐ OMT bad for patients
☐ Other: _____	

(4) When abnormalities are found on the structural examination, do you routinely include a somatic dysfunction diagnosis in the assessment or differential diagnosis?

☐ Yes. **Skip question 5, return form.**
☐ No. **Go on to question 5.**

(5) Check all of the following reasons for which you do not include a somatic dysfunction diagnosis in the assessment:

☐ Didn't know to	☐ Not relevant
☐ Forgot to	☐ Don't believe in it
☐ Inadequate training	☐ OMT not reimbursed
☐ Other: _____	

Thank you for completing this form. Please return to:

Medical Staff Office
 Capital Region Medical Center
 P.O. Box 1128
 Jefferson City, MO 65102

Figure 2. Structural examination survey questionnaire.

tical analysis using χ^2 probabilities for determining statistical significance was performed. The study was approved by the Medical Executive Committee at CRMC.

Results

Chart review data for structural examination assessment and documentation of somatic dysfunction are presented in *Table 1*. Charts in which the H&P was performed by osteopathic medical stu-

dents, house staff, or attending physicians were compared to establish whether any component of the structural examination was performed, whether the examinations performed were sufficient according to UOC Committee criteria, whether musculoskeletal abnormalities were found when examinations were performed, and whether somatic dysfunction diagnoses were listed when abnormalities were found (*Table 1*).

Results of the structural examination survey are presented in *Table 2*. The response rate for this survey was 58% overall, with 57% of the students and house staff responding and 59% of attending physicians responding. Survey data for students and house staff were combined because the number of responses for either group alone was too small for statistical analysis.

Comments

The data from this study represent a single AOA-accredited hospital's 1-year results on use of osteopathic concepts. During this yearlong period, the services at this hospital relocated to an AMA-accredited mixed-staff hospital with no history of requiring structural examinations. As part of this merger, a structural examination worksheet (*Figure 3*) was added to all patient charts and accepted as the required musculoskeletal examination by the UOC Committee. Osteopathic attending physicians, house staff, and students were notified about the availability of this worksheet and were provided with copies in advance of placement of the form in patient charts. Most (58%) of the H&Ps reviewed for this study were performed by attending physicians. House staff and students at this hospital were provided with a monthly osteopathic manipulative medicine lecture/lab before and after the merger and relocation.

The chart selection process for this study consisted of medical records personnel randomly selecting charts from piles awaiting signatures or discharge summaries. While this randomization system is potentially subject to selection bias, the pattern of charts selected suggests that this potential bias had minimal impact.

Table 1
Results of Chart Review (N = 115)

	Osteopathic students, %	House staff (osteopathic physicians), %	Attending physicians, %	Total, %	P value
Structural examination performed	92.0 (23/25)	69.6 (16/23)	44.8 (30/67)	60.0 (69/115)	.001*
Structural examination sufficient†	65.2 (15/23)	62.5 (10/16)	60.0 (18/30)	62.3 (43/69)	.831
Structural examination with abnormalities	38.1 (8/21)‡	53.8 (7/13)‡	53.8 (14/26)‡	48.3 (29/60)‡	.508
Somatic dysfunction diagnosis listed	12.5 (1/8)	0 (0/7)	7.1 (1/14)	6.9 (2/29)	.634

*Statistically significant difference between students, house staff, and attending physicians: Reject null hypothesis that there is no difference in the frequency of completing structural examinations in physical examinations performed by osteopathic attending physicians, house staff, and students.

†Criteria for structural examination sufficiency: (1) Performed in two or more positions, or reason for only one position documented, and (2) Included each of three components at least referable to the chief complaint—inspection, palpation, and motion testing; OR (1) Reason for deferred examination documented.

‡ Lower denominator compared to previous category is due to nine examinations that were rated as performed and sufficient because a reason for deferral was documented.

Table 2
Results of Structural Examination Survey (N = 58)

	Students/ House staff, %	Attending physicians, %	Total, %	P value
Do you routinely perform H&Ps on hospitalized patients?	82.3 (14/17)	53.7 (22/41)	62.1 (36/58)	.040*
Do you routinely perform an osteopathic structural examination in your hospital H&P?	100 (14/14)	50.0 (11/22)	69.4 (25/36)	.002*
Check all of the following reasons for which you do not routinely perform structural examinations on hospitalized patients:				
Inadequate training		0 (0/11)		
Examination skills forgotten		18.2 (2/11)		
Not enough time		45.5 (5/11)		
Forget to do examination		27.3 (3/11)		

*Statistically significant difference between groups: Reject null hypothesis that there is no difference between frequency of response for students/house staff and attending physicians.

(continued)

Table 2 (continued)
Results of Structural Examination Survey (N = 58)

	Students/ House staff, %	Attending physicians, %	Total, %	P value
Examination not relevant		54.5 (6/11)		
Osteopathic manipulative treatment unproven		0 (0/11)		
Osteopathic manipulative treatment not reimbursed		0 (0/11)		
Osteopathic manipulative treatment bad for patients		0 (0/11)		
Other		27.3 (3/11)		
When abnormalities are found on the structural examination, do you routinely include a somatic dysfunction diagnosis in the assessment?	50.0 (7/14)	40.9 (9/22)	44.4 (16/36)	.593
Check all of the following reasons for which you do not include a somatic dysfunction diagnosis in the assessment:				
Did not know to	0 (0/7)	23.1 (3/13)	15.0 (3/20)	0.168
Forgot to	85.7 (6/7)	23.1 (3/13)	45.0 (9/20)	.007*
Inadequate training	0 (0/7)	15.4 (2/13)	10.0 (2/20)	.274
Not relevant	42.9 (3/7)	30.8 (4/13)	35.0 (7/20)	.589
Do not believe in it	0 (0/7)	0 (0/13)	0 (0/20)	
Osteopathic manipulative treatment not reimbursed	0 (0/7)	7.7 (1/13)	5.0 (1/20)	.452
Other	0 (0/7)	23.1 (3/13)	15.0 (3/20)	.200
*Statistically significant difference between groups: Reject null hypothesis that there is no difference between frequency of response for students/house staff and attending physicians.				

The charts selected had H&Ps done by attending physicians (58%), house staff (20%), and students (22%) in a pattern typical for admissions to this hospital. Of the H&Ps performed by osteopathic attending physicians, 51% were by family practitioners, 36% by internists, 6% by surgeons, and 6% by emergency room physicians. While only four charts were for patients admitted to the care of surgeons, this pattern is typical for this primary care hospital, where most admissions are to family practice or internal medicine services, major trauma cases are transported to a tertiary care facility, and elective surgical admissions are usually to a different hospital. Overall, the chart selection process appears to have been adequately randomized.

The results of the chart review (*Table 1*) indicate that the overall compliance with AOA requirements for a structural examination and somatic dysfunction diagnosis was poor. The yearly total indicates that 60% of osteopathic physicians' hospital charts had any structural examination as part of the admitting evaluation. This percentage is considerably lower than the 78% to 80% figures reported in the previously cited multicenter reviews; however, the present results are not directly comparable to the study by Friedman and colleagues, which excluded charts with H&Ps completed by attending physicians or residents.⁹ The present study illuminated two factors that clearly contributed to this poor performance. First, the monthly average of reviewed charts that had a structural examination or documented reason for deferral, which was 77.9%,

was considerably higher than the yearly total. This discrepancy occurred largely because of three consecutive months (January 1996 through March 1996) when 40% or less of reviewed charts had no structural examination. During this time, the hospital was undergoing a relocation of services to another facility as part of the

previously mentioned merger with an AMA-accredited mixed-staff hospital (*Figure 4*). Excluding data from these three months, the yearly total of 67.4% (58 of 86) of charts having a structural examination in the H&P is still significantly lower than cited in the multicenter studies.

CAPITAL REGION MEDICAL CENTER Jefferson City, Missouri OSTEOPATHIC STRUCTURAL EXAMINATION	
☐ EXAM DEFERRED Reason: _____ ☐ EXAM PERFORMED Positions: ☐ Standing ☐ Prone ☐ Sitting ☐ Lateral ☐ Supine Reason for one position: _____ INSPECTION: Spinal Curves ☐ Normal ☐ Increased: _____ ☐ Decreased: _____ ☐ Scoliosis: _____ Other Asymmetry _____ PALPATION: Tenderness ☐ Absent ☐ Present: Locations _____ _____ _____ Spasm/Contracture ☐ Absent ☐ Present: Locations _____ _____ _____ MOTION TESTING: Region/Joint _____ ☐ Normal ☐ Restricted: _____ Region/Joint _____ ☐ Normal ☐ Restricted: _____ Region/Joint _____ ☐ Normal ☐ Restricted: _____ Region/Joint _____ ☐ Normal ☐ Restricted: _____ DIAGNOSIS: _____ (Add region of somatic dysfunction noted above to the Assessment.) Signature: _____ Date: _____ 100-18-S (3/95)	

Figure 3. Structural examination worksheet included in patient charts

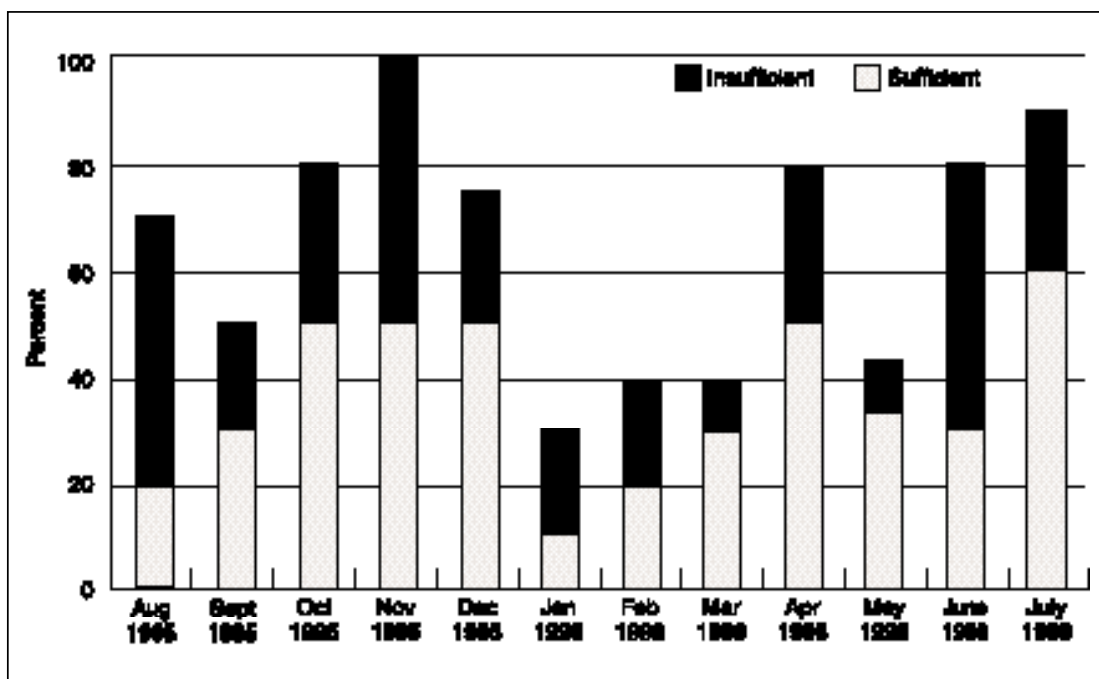


Figure 4. Monthly percentages of structural examinations performed in the admitting history and physical examination (average, 77.9%).

A second and more troublesome aspect of the poor compliance with AOA structural examination requirements is that the percentage of charts having any structural examination declined as the level of training of the examiner increased (χ^2 test, $P = .001$). Therefore, the null hypothesis—that there is no difference in the frequency of completing structural examinations in H&Ps performed by osteopathic attending physicians, house staff, and students—is rejected. The frequency of student documentation of any component of the structural examination (92%) was comparable to that at other institutions after implementation of a standardized examination form and an educational intervention. This finding is expected, as the multicenter study by Friedman and colleagues⁹ excluded charts in which the H&P was performed by residents or attending physicians. In the present study, attending physicians documented a structural examination in only 44.8% of the H&Ps completed, while interns and family practice residents fell between students and attending physicians, with 69.6% of their charts including a musculoskeletal examination.

In the survey, no responses were excluded because of the negative outlier statement “OMT bad for patients.” The

most common reasons attending physicians cited for not routinely performing structural examinations were “Exam not relevant” and “Not enough time.” Implicit in the latter response is a decision that the structural examination is less relevant to the patient given the limited time allocated for the H&P. Thus, all (11/11) of the attending physician respondents who do not routinely perform a structural examination omit it at least in part because it is judged to be less important to the patient being admitted. The reasons for this judgment are unclear but were not related to any belief that “OMT is unproven” or that “OMT is not reimbursed,” neither of which statements were supported by any survey respondents. Two of the three “other” reasons cited for not performing a structural examination (“Unable to do it at bed rest” and “Sometimes not possible in critically ill”) indicated a belief that such examinations are not feasible in the hospital setting. This belief that the structural examination is either less important or impractical in the hospital setting—held by half of the attending physicians participating in this survey—appears to be the major factor undermining compliance with AOA requirements.

It is conceivable that the AOA require-

ments for structural examination are impractical or unrealistic for hospitalized patients. The primary care hospital setting may have contributed to the low rate of structural examinations among attending physicians in this study. For some acutely ill or seriously injured patients, there is rapid transit to a tertiary care facility after stabilization, leaving little time for a complete history and physical examination. In this case, documentation of the reason for deferral of the structural examination should satisfy AOA requirements and improve compliance rates. The 1994 revision of the AOA guidelines attempted to facilitate compliance by accepting deferred examinations, examinations “at least referable to the area of chief complaint,” and a standardized structural examination form in lieu of a narrative report.¹ Any further dilution of these requirements, however, could encourage the judgment that the structural examination is irrelevant.

The low percentage (6.9%) of charts with abnormal musculoskeletal findings that listed a somatic dysfunction diagnosis was higher than that reported in the previously cited multicenter studies (3.3%⁸ and 1.5%⁹) but still low. The most common reasons cited in the survey for not including a somatic dysfunction

diagnosis in the assessment despite abnormal findings were "Forgot to" (45%) and "Not relevant" (35%). A significantly greater percentage of students and house staff checked "Forgot to" than did attending physicians (χ^2 test, $P = .0072$). Those who checked "Not relevant" were evenly distributed between students/house staff and attending physicians. These two responses are interrelated because forgetting to do a part of the physical examination implies that it is deemed unimportant for that patient. So the attitude that a somatic dysfunction diagnosis is less important or irrelevant to a hospitalized patient is a major contributor to the poor documentation of somatic dysfunction diagnoses in this hospital. An additional 15% of respondents "didn't know to" include a somatic dysfunction diagnosis in the assessment when abnormalities were found in the structural examination, indicating a need for further education on this issue. A clearer definition in the AOA accreditation requirements of the need to document somatic dysfunction diagnoses in the assessment would help to educate physicians and students. Improvement in this aspect of somatic dysfunction documentation is vital to demonstrate the uniqueness of osteopathic medical practice as compared to allopathic medical practice.

Conclusions

In this primary care osteopathic training hospital, there was poor overall compliance with AOA requirements for structural examinations in the H&P. This poor compliance was due in part to a decline in completion of structural examinations during a merger and relocation. However, there was also a decline in performance of the structural examination in the H&P with advancing level of training. The lower percentage of attending physicians completing the structural examination was due largely to a belief that it is less relevant or impractical for acutely ill hospitalized patients. It is our experience and belief that this attitude holds true in at least some other osteopathic hospitals.

To improve compliance with AOA

guidelines for structural examinations, several steps are suggested for this osteopathic hospital and others with similar compliance problems:

- Direct educational programs on structural examination and osteopathic manipulative treatment to attending physicians as well as house staff and students.
- Focus hospital educational programs on the relevance of the structural examination and osteopathic manipulative treatment to acutely ill patients.
- Increase these educational endeavors during hospital mergers and relocations.
- Encourage documentation of a reason for deferral of the structural examination as being acceptable for meeting AOA requirements.
- Use a standardized hospital structural examination form on every patient chart.
- Encourage efficacy research on manipulation for hospitalized patients.

Furthermore, the AOA can promote better documentation of somatic dysfunction diagnoses by clearly mandating that they be included in the H&P assessment in the accreditation requirements for acute care hospitals.

The standard of care for manipulation in the hospital setting, as delineated in the textbook, *Foundations for Osteopathic Medicine*, is largely empirical—based on the cumulative experience of osteopathic physicians over the past century rather than efficacy studies.¹¹ Many current osteopathic attending physicians have not seen this standard practiced in the hospital setting during rotations, internships, or residencies. To reverse this self-perpetuating situation—in which students who do not see osteopathic manipulative treatment in the hospital go on to become attending physicians who do not perform structural examinations on hospitalized patients—a major educational effort must be undertaken to target current attending physicians. Such physicians need to be instructed as to the utility of performing structural examinations, thereby leading to somatic dysfunction diagnoses and efficacious manipulative treatment for critically ill patients. Also, the value of using osteopathic concepts in the hospital setting needs to be demonstrated through education, experience,

and research to achieve better compliance rates.

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