True Costs of Medical Clearance: Accuracy and Disagreement between Psychiatry and Emergency Medicine Providers

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Abstract

Introduction: Medical clearance is required to label patients with mental illness as free of acute medical concerns. However, tests may extend emergency department lengths of stay and increase costs to patients and hospitals. The objective of this study was to determine how knowledgeable emergency and psychiatric providers are about the costs of tests used for medical clearance. Materials and Methods: We surveyed the department of psychiatry (Psych) and department of emergency medicine (EM) faculty and residents to obtain their estimates of the costs of 18 laboratory/radiographic imaging studies commonly used for medical clearance. Survey responses were analyzed using the Wilcoxon signed-rank test to compare the median cost estimates between residents and faculty in EM and Psych. Results: A total of 99 physicians (response rate, 47.8%) completed the survey, including 47 faculty (EM = 28; Psych = 20) and 52 residents (EM = 29; Psych = 23). Across all the groups, cost estimates for tests were inaccurate, off by several hundred dollars for three tests, and by $13–$80 for 15. Significant differences between EM and Psych providers for estimated median costs of specific tests included between residents for urine drug screens (EM: $800; Psych: $50; P < 0.0001) and ECG (EM: $25; Psych: $75; P = 0.004); between faculty for urinalysis (EM: $40; Psych: $18; P = 0.020) and urine drug screen (EM: $100; Psych: $10; P < 0.0001); and between all physicians for urine drug screen (EM: $500; Psych: $50; P < 0.0001). Conclusion: Further education on the financial costs of medical clearance is needed to inform workup decisions and consensus between emergency and psychiatric providers.

Keywords: Behavioral Emergencies, Health-care Costs, Mental Health, Medical Clearance

INTRODUCTION

Behavioral health is the primary reason for 5.3 million emergency department (ED) visits annually in the United States, comprising 3.9% of all ED visits.[1] Medical clearance is the process by which patients with a psychiatric complaint are determined to be stable for admission to either a psychiatric inpatient unit or for transfer to a psychiatric emergency room and free from any physical or organic conditions contributing to their presentation.[2,3] However, medical clearance is a common area of disagreement between emergency and psychiatric providers.[4] Medical clearance often requires laboratory tests and radiographic imaging to rule out an underlying physical etiology of the psychiatric complaint, alleviate psychiatric provider concerns, and expedite admission to psychiatric facilities.[5,6] Medical clearance not only extends ED length of stay,[7] tying up beds that could be used to treat other waiting patients, but also increases costs to patients, and if unpaid, to the hospital providing emergency psychiatric care.[8] Literature suggests that physicians are often unaware of hospital billing and administrative procedures and the cost of workups they order.[9,10] The objective of this study was to determine how knowledgeable emergency and psychiatric providers are about the costs of tests used for medical clearance of patients with psychiatric complaints.

MATERIALS AND METHODS

The study took place in a large, urban, academic, public hospital serving a predominantly low-income minority population with over 100,000 annual emergency visits. The hospital has a dedicated psychiatric ED with approximately 130

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10,000 psychiatric patients seen in 2015. The local institutional review board approved this study.

An electronic survey was distributed to all department of psychiatry (Psych) and section of emergency medicine (EM) faculty and residents. The survey provided a list of 18 laboratory and imaging tests commonly used for medical clearance. Participants were asked to estimate the cost of each test. Responses were free text rather than multiple choices.

Participants’ responses were compared to actual costs at the study hospital. Actual costs of each test were calculated by applying the hospital’s Medicare cost-to-charge ratio to actual test charges.[10,11] Survey responses were analyzed using the Wilcoxon signed-rank test. Differences in median cost estimates and actual costs were compared for each test between six group pairs: all residents and all faculty, all EM and all Psych, EM faculty and Psych faculty, EM faculty and EM residents, and Psych faculty and Psych residents. All analyses were performed using Stata 13.1 software (StataCorp in College Station, TX).

**RESULTS**

A total of 99 physicians completed the survey, including 47 faculty (EM = 28; Psych = 20) and 52 residents (EM = 29; Psych = 23). The overall response rate was 47.8% (39.4% for EM faculty, 69.0% for EM residents, 46.5% for Psych faculty, and 45.1% for Psych residents).

The mean cost estimates for tests were off from actual costs by >100% for four tests, by >200% for two tests, and by >500% for two tests (range, 33%–589.9%; $63.18–$252.02). Fifteen estimates were above and three below actual costs [Figure 1]. There was a significant disagreement between EM and Psych respondents for 8 of 18 tests [44.4%; Figure 2 and Table 1]. Examples of significant differences between EM and Psych providers for estimated median costs of specific tests included urine drug screen (EM: $500, interquartile range [IQR]: $100–$1000; Psych: $50, IQR: $10–$80; \(P < 0.0001\)) and electrocardiogram (EM: $30, IQR: $18–$90; Psych: $75, IQR: $50–$100; \(P = 0.002\)). Faculty respondents in the EM and Psych departments differed on median estimates for seven tests [27.8%; Supplemental Table 1], while resident respondents in EM and Psych differed on median estimates for just two tests (11.1%), electrocardiogram (EM residents: $25, IQR: $10–$50; Psych residents: $75, IQR: $50–$150; \(P = 0.004\)), and urine drug screen [EM residents: $800, IQR: $100–$1200; Psych Residents: $50, IQR: $30–$100; \(P < 0.0001\); Supplemental Table 2]. Examples of significant differences between EM and Psych faculty included salicylate level (EM faculty: $50, IQR: $50–$125; Psych faculty: $30, IQR: $10–$50; \(P = 0.003\)), nonpsychiatric drug levels (EM faculty: $200, IQR: $100–$500; Psych faculty: $100, IQR: $20–$185; \(P = 0.005\)), urinalysis (EM faculty: $40, IQR: $25–$75; Psych faculty: $18, IQR: $10–$50; \(P = 0.020\)), and urine drug screen (EM faculty: $100, IQR: $80–$100; Psych faculty: $10, IQR: $9–$63; \(P < 0.0001\)).

When comparing faculty to resident groups, there was no significant disagreement overall or within EM [Supplemental Tables 3 and 4]. Within Psych, faculty and residents disagreed on rapid plasma regain (Psych faculty: $45, IQR: $20–$53; Psych residents: $60, IQR: $50–$100; \(P = 0.032\)) and urine drug screen [Psych faculty: $10, IQR: $9–$63; Psych residents: $50, IQR: $30–$100; \(P = 0.040\); Supplemental Table 5].

**DISCUSSION**

In a survey of academic emergency and psychiatric providers affiliated with a psychiatric ED, providers’ cost estimates for several tests required for medical clearance were inaccurate when compared to actual test costs. Furthermore, there was minimal disagreement between faculty and residents in the same department, but there was a disagreement on the costs of over half of medical clearance tests between all providers and faculty providers in EM and Psych. This finding highlights the disconnect between two departments in the same hospital.
Table 1: Difference in Mean Estimated Costs Between All Emergency Medicine and All Psychiatry

| Test                              | EM Mean (Std. deviation) | Psych Mean (Std. deviation) | 95% confidence interval for mean | Range | Minimum | Maximum | P     |
|----------------------------------|--------------------------|-----------------------------|---------------------------------|-------|---------|---------|-------|
|                                  | Std. error               |                             | Lower bound                      |       |         |         |       |
|                                  |                          |                             | Upper bound                      |       |         |         |       |
|                                  |                          |                             | 95% confidence interval for mean |       |         |         |       |
| Cardiac Enzymes                  | 256.96 (664.29)          | 213.14 (270.62)             | 79.07 (129.86)                  | 20    | 5       | 500     | 0.801 |
| Acetaminophen Level              | 106.76 (107.38)          | 70.83 (104.91)              | 77.73 (38.14)                   | 10    | 5       | 500     | 0.004 |
| Blood Alcohol Level (BAL)        | 104.32 (138.47)          | 58.21 (84.77)               | 67.24 (32.12)                   | 5     | 80      | 500     | 0.003 |
| Salicylate Level                 | 110.50 (140.11)          | 68.71 (106.11)              | 72.99 (35.65)                   | 4     | 1000    | 1000    | 0.006 |
| Basic Metabolic Panel (BMP)      | 93.70 (118.61)           | 71.63 (67.65)               | 61.93 (50.81)                   | 5     | 500     | 500     | 0.496 |
| Chest X-Ray (CXR)                | 186.96 (124.35)          | 184.65 (171.17)             | 153.66 (237.33)                 | 25    | 500     | 500     | 0.533 |
| Coagulation Studies              | 107.95 (91.07)           | 99.65 (104.40)              | 83.56 (71.78)                   | 5     | 400     | 500     | 0.235 |
| Complete Blood Count (CBC)       | 92.95 (94.97)            | 73.02 (72.85)               | 67.51 (50.60)                   | 5     | 400     | 500     | 0.293 |
| Comprehensive Metabolic Panel (CMP) | 149.80 (175.18)       | 100.81 (86.71)              | 102.89 (74.13)                  | 10    | 1000    | 1000    | 0.144 |
| Creatinine Phosphokinase (CPK)   | 109.86 (154.12)          | 76.16 (88.20)               | 68.58 (49.02)                   | 5     | 1000    | 1000    | 0.171 |
| CT Head                          | 1224.55 (1540.73)        | 974.42 (896.51)             | 811.94 (698.51)                 | 100   | 10000   | 10000   | 0.408 |
| Non-psychiatric serum drug level | 389.00 (459.63)          | 174.19 (175.84)             | 264.74 (120.07)                 | 20    | 2000    | 2000    | 0.002 |
| Electrocardiogram (ECG)          | 81.30 (153.48)           | 110.49 (123.37)             | 40.20 (72.52)                   | 5     | 1000    | 1000    | 0.002 |
| Rapid Plasma Reagin (RPR)        | 89.16 (95.90)            | 74.30 (81.65)               | 63.48 (49.17)                   | 10    | 500     | 500     | 0.425 |
| Thyroid Stimulating Hormone (TSH)| 76.75 (53.25)            | 64.77 (56.12)               | 62.49 (47.49)                   | 5     | 250     | 250     | 0.091 |
| Urinalysis (UA)                  | 58.75 (49.50)            | 40.98 (46.44)               | 65.49 (45.24)                   | 5     | 200     | 200     | 0.011 |
| Urine Drug Screen (UDS)          | 602.05 (532.74)          | 61.19 (68.43)               | 459.38 (40.13)                  | 5     | 2000    | 2000    | 0.000 |
| Urine Pregnancy Test (UPT)       | 45.05 (38.13)            | 35.00 (39.53)               | 34.84 (22.83)                   | 1     | 200     | 200     | 0.044 |
Prior studies on cost have shown that providers have poor knowledge of medical costs, and that faculty physicians do not necessarily have more knowledge than residents.[8,9,12] This study corroborates that finding in the emergency Psych setting. Disagreement between psychiatric and emergency providers has been previously documented in regard to the tests required for medical clearance,[2,3] but this study adds cost as an additional element of disagreement. It is possible that disagreement on costs is a source of the overall disagreement between fields on medical clearance, or that the two fields disagree on costs because of their underlying philosophical disagreement on medical clearance more broadly.

Patients hospitalized for behavioral health disorders are more than twice as likely as patients hospitalized for other reasons to be uninsured.[13] Uninsured patients are at higher risk of financial harm from unnecessary testing and procedures since over half are also low income.[14,15] In addition, over 70% of nonprofit hospitals and likely a higher percentage of for-profit hospitals routinely charge uninsured patients higher prices for health care than what they collect from insurance companies and Medicare for covered patients.[16]

Due to the high prevalence of uninsured patients among those with psychiatric illness, nearly two-thirds of the costs of medical clearance are likely paid by the government, charities, or passed on to other patients, businesses, and taxpayers through cost-shifting.[17] Therefore, cost, within the limits of patient safety, should factor into medical clearance decisions to protect psychiatric patients and the broader public.

Finally, patients with psychiatric illness requiring psychiatric admission or transfer spend 42% longer in EDs than medical patients.[18,19] Besides the financial cost, increased testing for medical clearance contributes to ED length of stay which keeps psychiatric patients in the ED away from work and family for prolonged periods while delaying needed psychiatric treatment. Simultaneously, longer ED length of stay for psychiatric patients leads to crowding, diverting beds, and staffing resources from other ED patients.[20] Both the utility and the cost of these medical clearance tests should be considered by emergency and psychiatric providers.

This study has several limitations. First, it is a single-center study and may be biased by environmental influences specific to the center where it was performed. Second, the data were obtained from a qualitative survey and represented the opinions of respondents subject to their interpretation of the questions asked. For example, the survey asked respondents to estimate the “cost” of tests. The public, patients, and providers are often confused by health-care costs due to large gaps between charges and collections for health services, and cost can be interpreted from a variety of perspectives such as the cost to the hospital or provider, the cost to the insurance company or payer, and the cost to the patient. Unfortunately, we do not know which “cost” each respondent was envisioning when completing this survey. Like many surveys, it has only a modest response rate which introduces the possibility of a respondent bias where those choosing to respond are different from those who did not respond. Finally, the actual costs used in our study to determine the accuracy of respondents’ estimates were also estimated using the cost-to-charge ratio which, while previously validated, also decreases the precision.[10]

Physicians ordering and requesting workup for medical clearance are frequently unaware of the costs of these tests. There is a disagreement between emergency and psychiatric providers on the costs of a majority of medical clearance tests. Further education on the financial costs of medical clearance is needed to inform medical clearance decisions and build consensus between emergency and psychiatric providers.

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Conflicts of interest
There are no conflicts of interest.

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