Oregon Health & Science University
School of Medicine

Scholarly Projects Final Report

Title *(Must match poster title; include key words in the title to improve electronic search capabilities.)*

The Impact of Online Medical Control Physician Involvement on Outcomes for Calls Related to Emergency Medical Services Patient Refusals

Student Investigator's Name

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Scholarly Projects Curriculum

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Project/Research Question

1. In patients who initially refuse emergency medical services (EMS) transport, does speaking with an online medical control (OLMC) physician lead to increased transport rates compared to those patients who do not speak with OLMC?
2. Is the proportion of patients transported associated with patient sex, physician experience level, or involvement of family in OLMC calls?

Type of Project *(Best description of your project; e.g., research study, quality improvement project, engineering project, etc.)*

Research study

Key words *(4-10 words describing key aspects of your project)*

Online medical control
Medical direction
Emergency medical services
Refusal
Transport

Meeting Presentations
If your project was presented at a meeting besides the OHSU Capstone, please provide the meeting(s) name, location, date, and presentation format below (poster vs. podium presentation or other).

N/A

Publications *(Abstract, article, other)*
If your project was published, please provide reference(s) below in JAMA style.

N/A

Submission to Archive
Final reports will be archived in a central library to benefit other students and colleagues. Describe any restrictions below (e.g., hold until publication of article on a specific date).

No restrictions.

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Next Steps

What are possible next steps that would build upon the results of this project? Could any data or tools resulting from the project have the potential to be used to answer new research questions by future medical students?

There are a number of next steps that our group and others may wish to explore. First, further research is needed into which populations and chief complaints are most receptive to OLMC recommendations. This could increase efficiency and targeting of OLMC use. Second, the outcomes of patients who refuse transport are still poorly understood. Future studies may wish to hone in on the frequency of repeat 911 calls to the same address or short-term mortality rates following refusal of transport. The pool of OLMC audio calls that was utilized in this project could be a source of data for future students, though they may wish to combine this with more updated calls

Please follow the link below and complete the archival process for your Project in addition to submitting your final report.

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This report describes work that I conducted in the Scholarly Projects Curriculum or alternative academic program at the OHSU School of Medicine. By typing my signature below, I attest to its authenticity and originality and agree to submit it to the Archive.

(Kristin Cassidy Potter)

name

Mentor's Approval *(Signature/date)*

X

Mentor Name Matthew Neth 3/14/2024

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Introduction

Not every contact with emergency medical services (EMS) leads to patient transport, a point that has known patient safety and medicolegal implications.[1-5] For this reason, many EMS agencies follow a standardized set of protocols in the case of patient refusal to transport, particularly for those patients deemed "high-risk" by nature of their presentation or mechanism of injury. One of the available resources in the case of patient refusal is online medical control (OLMC). Contact with OLMC allows for real-time medical direction from an emergency medicine physician to EMS professionals in the field via phone or two-way radio. Common roles of OLMC include providing direction for medication use, termination of cardiopulmonary resuscitation in the field, or next steps in patient care. While this allows medical direction to have a direct influence on prehospital care, each call requires the full attention of a physician who may be actively facilitating in-hospital care. Thus, optimizing the efficiency and impact of OLMC has been a topic of interest for many years.[6-7]

Recently, the idea of patient-physician communication via OLMC contact has been explored as a means of reducing rates of patient refusal to transport to the hospital via ambulance. Review of existing literature suggests that contact with OLMC leads to increased rates of transport via EMS; however, these studies were performed over two decades ago and may not be relevant to current practice.[6,8-10] These papers have also had limited ability to assess the efficacy of OLMC when stratified by granular patient- and call-related data such as age or restraint use. One prior study suggests that adults over age 65 may be more amenable to transport if recommended by a physician, though these conclusions were limited given the study's design as a telephone survey following EMS contact.[2] These gaps in understanding of OLMC's influence leave best practices for its usage incompletely understood as it relates to patient transport.

To this end, our study aims to assess the impact of discussion between patients and OLMC physicians when EMS providers request assistance for refusal of transport. Through review of audio calls, the recommendation of OLMC and pre-determined patient- and call-related factors will be assessed for association with transport rates. We hypothesized that the proportion of patients transported by EMS would increase following discussion with OLMC, specifically when direct communication occurs between the patient and physician.

Methods

One hundred sixty-four patients who declined transport by EMS between May 1, 2022 and August 31, 2022 were included in the study. Patients were identified for inclusion through review of EMS-initiated OLMC calls related to refusals during the specified time period. These calls were collected as a part of standard operating procedures and were derived from a large metropolitan area covering nearly 1.8 million residents within the tri-county area near Portland, Oregon. Audio files were excluded if the primary reason for OLMC contact was unrelated to patient refusal to transport. Patients were also excluded if their final disposition could not be elucidated through the information provided in the call. The responding OLMC physicians included attending, fellow, and resident emergency medicine physicians from the area's Medical Resource Hospital. Patients were grouped for analysis according to whether or not they engaged in direct communication with OLMC. Pre-determined patient- and call-related variables were collected through call review and data abstraction with the assistance of medical students and emergency medicine residents.

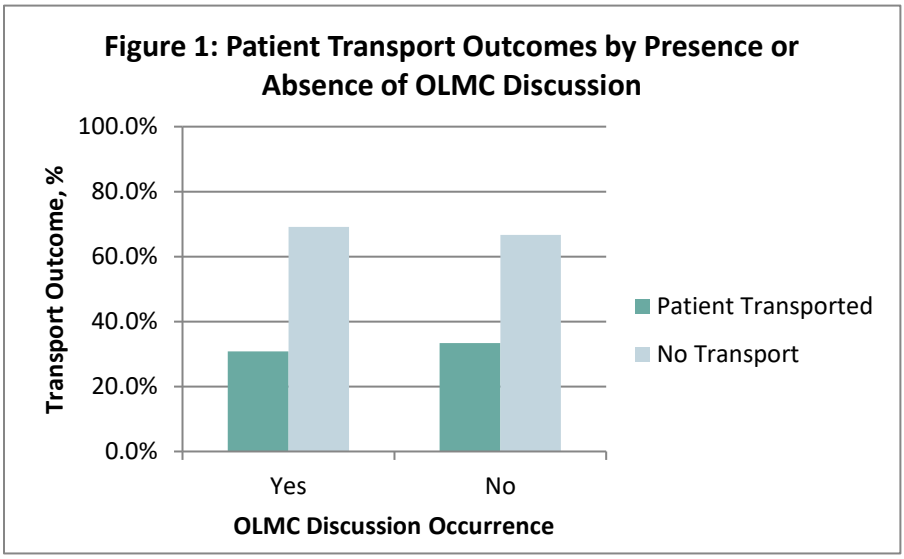
The primary outcome of interest was the proportion of patients who accepted EMS transport to the hospital following discussion with OLMC. Secondary outcomes included the proportion of patients who were transported when stratified by patient sex, physician experience level (e.g. resident or fellow versus

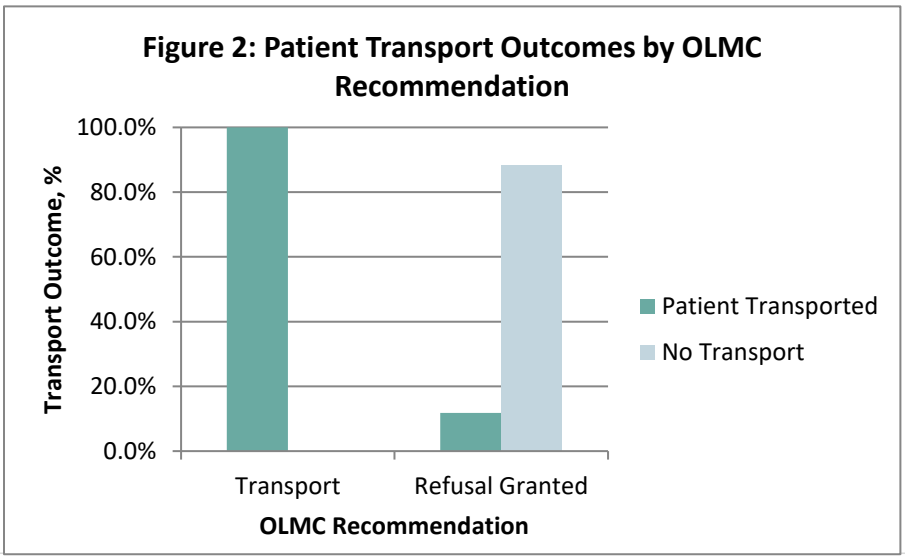
attending physician), and involvement of family in discussion with OLMC. Descriptive statistics and Chi-square analysis were used for statistical comparisons among groups. REDCap software was utilized for data collection and analysis. This project received the approval of the Oregon Health & Science University Institutional Review Board.

Results

OLMC Impact on Transport Rates

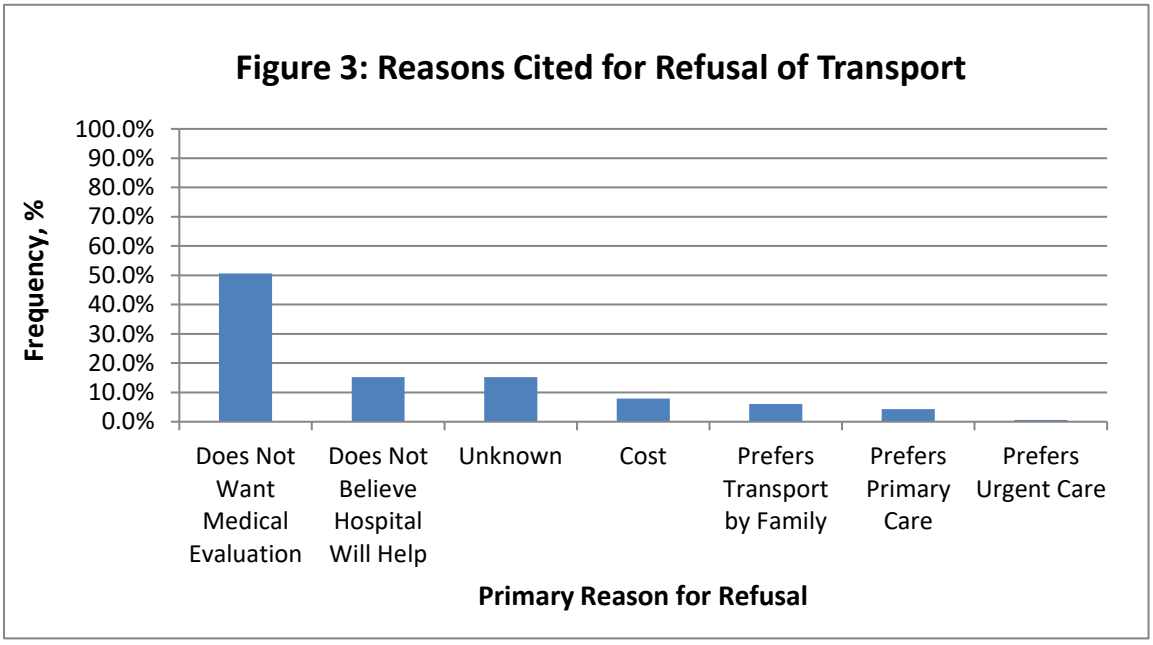
One hundred sixty-four patients were identified during the study period. An OLMC physician directly communicated with 107 patients, 33 (30.8%) of whom opted for transport to the hospital following discussion (Figure 1). Comparatively, 19 of 57 patients (33.3%) who did not speak with an OLMC physician ultimately agreed to transport ($p = 0.743$). While discussion alone appears insufficient to influence patient outcomes, a specific physician recommendation for transport was associated with increased transport rates; 37 patients (100%) followed OLMC recommendations for transport whereas only 15 of 127 (11.8%) opted for transport if the physician granted a refusal ($p < 0.001$, Figure 2). The proportion of patients agreeable to transport was not significantly different whether or not family was involved in the discussion with OLMC ($p = 0.395$). Thus, attempts at optimization of OLMC may wish to focus the majority of call time on direct patient-physician interaction.





Patient- and Call-Related Factors

In patients who provided a reason for refusal, the most commonly cited factor was preference not to undergo a medical evaluation (83 patients, 50.6%), followed by a belief that a hospital visit would not be helpful (25 patients, 15.2%) and concerns about the cost of an ambulance ride and hospitalization (13 patients, 7.93%) (Figure 3). Of note, only a small proportion of patients requested evaluation in a setting other than the hospital. Only eight patients (4.88%) expressed a desire to be seen by their primary care provider or an urgent care facility rather than the emergency department. These data suggest that those who initially refuse transport may be less likely to seek care at another facility and could be prone to loss to follow up. The clinical outcomes of patients refusing care are outside the scope of this study.



Rates of transport by EMS did not vary significantly by patient sex, with 34 (32.1%) males and 18 (31.6%) females ultimately agreeing to transport ($p = 0.926$). Similarly, patients' likelihood to accept transport was independent of physician level of training. Twenty-six patients (35.1%) accepted transport at the recommendation of an attending physician compared to 26 (28.9%) who spoke to a resident or fellow ($p = 0.392$). This suggests that departments may wish to have the first available physician assume control of OLMC calls for refusals rather than waiting for the most experienced team member to become available.

In cases where transport is deemed necessary by an OLMC physician, protocol may dictate that EMS personnel employ restraints to transport patients. This generally occurs when medical professionals determine that the patient lacks the capacity to make an informed decision about refusal of care. The utilization of chemical and/or physical restraints was overall low in this study (seven patients, 13.5%), suggesting that the majority of patients who transported following OLMC recommendation did so voluntarily. Restraint implementation did not vary significantly by sex (three (2.83%) male versus four (7.02%) female patients, $p = 0.860$), and chemical restraint was the most commonly utilized method. Amongst those transported, only one required instatement of a peace officer hold.

Discussion

For a variety of reasons, some patients will decline transport to the hospital following initial contact with EMS. Agencies may involve OLMC in these scenarios, speculating that direct communication with a physician may increase rates of transport; however, existing studies in this realm are dated and with unclear applicability to current practice.[6,8-9] In this study, we find that while direct patient-physician communication via OLMC does not significantly influence patient disposition, a specific recommendation for transport is associated with increased transport rates. The majority of patients in these scenarios will opt for voluntary transport, and the use of restraints or formal holds is seldom necessary.

The findings in the present study provide new insight to existing research which is often decades old.[6,8-9] In one prior study by Alicandro et al., contact with a base-station OLMC physician was found to increase rates of transport for patients who initially refused.[9] While in agreement with our study, these findings applied only in cases deemed "high-risk", such as when a head injury or altered level of consciousness was present. Additionally, researchers were unable to identify which aspect of the discussion with OLMC was most influential. In the present study, we see a significant uptick in transport rates when OLMC makes a transport recommendation that is not seen with discussion alone. These findings suggest that focusing conversation around physician recommendations may maximize both influence and efficiency. This is consistent with an existing study suggesting that increased physician assertiveness is correlated with increased transport rates, shedding new light on the role of OLMC in current-day practice.[6]

Our findings also provide updated knowledge on the role of trainees in OLMC interactions. In 2001, Hoyt et al. found that emergency medicine residents and faculty had equivalent effect on transport rates in patients refusing care[8]; however, this study is dated and with questionable applicability to the rapidly expanding pool of residency programs. They were also unable to further delineate trainee levels (e.g. fellows, medical directors, etc.). Our study suggests that trainees of any level within emergency medicine residency, fellowship, and attending roles influence patient transport to similar degrees. Through a lens of clinical practice, trainees are able to gain valuable experience leading OLMC calls without compromising patient safety as it relates to transport outcomes. Further, having residents take such calls may free up physicians in supervisory roles to continue managing the department.

Inherent to this study are the limitations imposed by its retrospective nature and fixed data points available through audio calls. For example, the patient disposition utilized for this study was based on the plan stated by EMS and/or OLMC at the end of the call. It is possible that despite all 37 patients agreeing to transport after physician recommendation, some ultimately changed their minds and decided to remain at the scene or travel by personal vehicle. This would lead to an overestimation of the influence of OLMC that was not captured by our study design. Similarly, restraints may have been unexpectedly needed after the call terminated in cases requiring transport, leading to this data point being underreported in our study.

While the reasoning behind a patient's refusal may be multifaceted, our study was only able to capture the single most pressing reason for declining transport in each patient. It is likely that some factors play a larger secondary role in refusal of care than what is represented here. Additionally, the outcome of those patients who refused transport to the hospital was outside the scope of the present study. Our future research may wish to focus on the incidence of repeat 911 calls, presentation to the hospital by private vehicle, and short-term mortality in patients who are left at the scene. Further investigation into these realms will help to further optimize the efficiency and efficacy of OLMC in promoting transport among these patients.

Conclusions

For patients who initially refuse EMS transport to the hospital, discussion with OLMC alone may be insufficient to influence transport disposition; however, a direct recommendation for transport from an OLMC physician is associated with increased transport rates. Emergency medical physicians at all levels should focus on direct patient-physician communication to maximize call efficiency and optimize transport outcomes.

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