

Frequency of Manuscript Publication Following Presentation of EMS Abstracts at National Meetings

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Abbreviations:

AAEMS: Association of Air Medical Services
ACEP: American College of Emergency Physicians
EMS: Emergency Medical Services
EM: emergency medicine
NAEMSE: National Association of EMS Educators
NAEMSP: National Association of EMS Physicians
RCTs: randomized controlled trials
SAEM: Society for Academic Emergency Medicine

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Abstract

Introduction: Specialized knowledge and a scientific body of literature are the foundation of the recognition of Emergency Medical Services (EMS) as a subspecialty within emergency medicine (EM). Emergency Medical Services research often is presented at national meetings and published in abstract form, but full publication occurs less frequently.

Problem: The primary goal of the study was to determine the rate at which EMS-related research presented at selected conferences went on to manuscript publication. A secondary goal was the determination of the time to manuscript publication.

Methods: A cross-sectional study of published abstracts from the 2003-2005 national meetings of the American College of Emergency Physicians (ACEP), Society for Academic Emergency Medicine (SAEM), National Association of EMS Physicians (NAEMSP), Association of Air Medical Services (AAMS), and the National Association of EMS Educators (NAEMSE) was conducted to identify EMS-related abstracts. PubMed (National Center for Biotechnology Information, Bethesda, Maryland USA) was searched using abstract title keywords and authors' names to determine if the study had been published in a PubMed-indexed journal in the time since presentation and abstract publication.

Results: Abstracts for the five conferences were reviewed for 2003-2005. Six hundred and thirty-five EMS-related abstracts met the inclusion criteria. The total number of EMS abstracts presented and the percent subsequently published as a manuscript were: SAEM 135, 53.3%; ACEP 128, 48.4%; NAEMSP 282, 42.9%; AAMS 66, 33.3%; and NAEMSE 24, 16.7%. The overall rate of publication was 44.3%. The average time to publication was 22.2 months (SD = 16.5 months, range = 0-94 months).

Conclusion: Less than half of EMS abstracts go on to manuscript publication. This may represent missed opportunities for the growth of EMS as a subspecialty.

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Introduction

Specialized knowledge and a scientific body of literature are the foundations of the recognition of Emergency Medical Services (EMS) as a subspecialty within emergency medicine (EM).¹ The work of investigators conducting EMS-based research provides a means to continually expand the knowledge base of the specialty. As with other specialties, abstract presentation of research at conferences is an important stepping stone to manuscript publication. The extensive peer review process that occurs when a manuscript is submitted for publication has become the accepted tool used by the scientific community to evaluate research quality. Emergency Medical Services research is often presented at national meetings in abstract form, but full publication occurs less frequently.

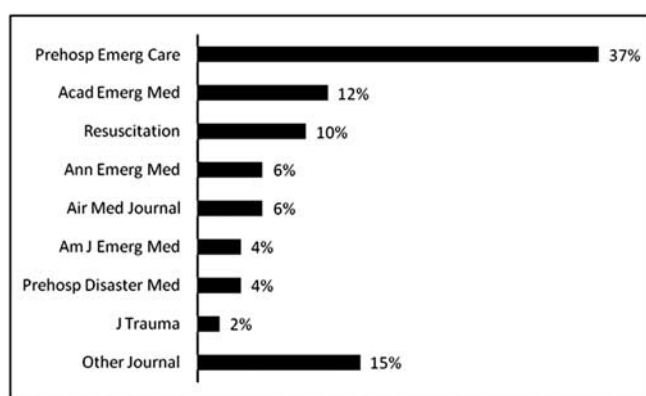
The purpose of this research was to determine the rate at which EMS-related research presented at selected EM conferences and published in abstract form went on to manuscript publication. The time to manuscript publication following abstract presentation was also investigated.

Conference	No. of EMS Abstracts Presented	No. of EMS Manuscripts Published	Publication Rate
ACEP	128	62	48.4%
AMTC	66	22	33.3%
NAEMSE	24	4	16.7%
NAEMSP	282	121	42.9%
SAEM	135	72	53.3%
Overall	635	281	44.3%

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Table 1. EMS Abstract to Publication Rate by Conference

Abbreviations: ACEP, American College of Emergency Physicians; AMTC, Air Medical Transport Conference; EMS, Emergency Medical Services; NAEMSE, National Association of EMS Educators; NAEMSP, National Association of EMS Physicians; SAEM, Society for Academic Emergency Medicine.



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Figure 1. EMS Manuscripts by Journal of Publication

Abbreviations: Acad Emerg Med, Academic Emergency Medicine Journal; Air Med Journal, Air Medical Journal; Am J Emerg Med, American Journal of Emergency Medicine; Ann Emerg Med, Annals of Emergency Medicine Journal; EMS, Emergency Medical Services; J Trauma, Journal of Trauma; Prehosp Disaster Med, Prehospital and Disaster Medicine Journal; Prehosp Emerg Care, Prehospital Emergency Care Journal.

Methods

Study Design and Setting

A cross-sectional study of published abstracts presented at the 2003-2005 national meetings of the American College of Emergency Physicians (ACEP),²⁻⁴ Society for Academic Emergency Medicine (SAEM),⁵⁻⁷ National Association of EMS Physicians (NAEMSP),⁸⁻¹⁰ Association of Air Medical Services (AAMS),¹¹⁻¹³ and the National Association of EMS Educators (NAEMSE)¹⁴⁻¹⁶ was conducted to identify EMS-related abstracts. All published abstracts, regardless of presentation format (eg, oral and poster), were reviewed for the study period. Abstracts were first screened for EMS relevance, with those unrelated to EMS excluded. Emergency Medical Services-related abstracts were entered into a database and coded based on key topic with up to three topics allowed per study.

Human Subjects Review

The State University of New York at Buffalo's Health Sciences' Institutional Review Board reviewed and approved the study protocol.

Protocol for Identifying Publications

PubMed (National Center for Biotechnology Information, Bethesda, Maryland USA) was searched from July 2011 through August 2012 to determine whether each abstract presented was subsequently published as a manuscript in any of the PubMed-indexed medical journals as of the date of the search. Studies where the manuscript was published prior to the abstract presentation were excluded. For the initial search, abstract titles were searched verbatim. If this did not yield a publication, a search using keywords from the abstract title was performed. If a manuscript publication was still not found, a final search was conducted using the lead author's name. A second reviewer repeated this search process for any abstract without an associated manuscript. If no publication could be identified after the two independent searches, the abstract was labeled as unpublished. Discrepancies were discussed and a final consensus determination was made to include or exclude the abstract.

Outcome Measures

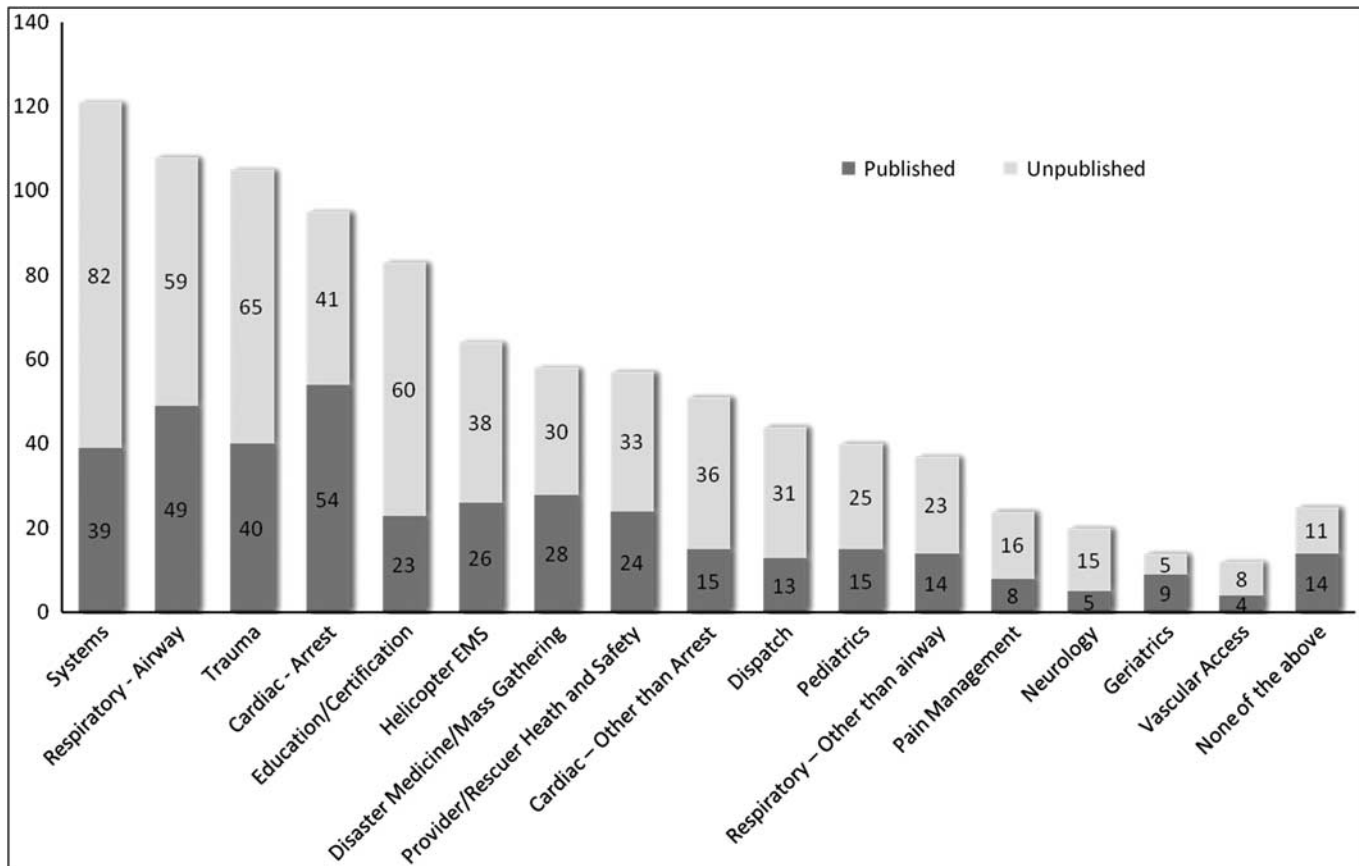
The primary outcome measure in this descriptive study was whether or not an EMS-related abstract presented at one of the selected EM conferences and published in abstract form went on to manuscript publication. The percentage of all EMS-related abstracts that went on to manuscript publication and the number published after presentation at the selected conferences was calculated. The time to manuscript publication following abstract presentation also was investigated. Once a publication was verified, the time in months from conference presentation to manuscript publication was calculated and recorded.

Analytical Methods

The research was descriptive and not intended to test specific hypotheses. Statistical analyses were not performed.

Results

A total of 635 published EMS abstracts from the 2003-2005 national meetings of ACEP, SAEM, NAEMSP, AAMS, and NAEMSE were identified. The PubMed search identified 281 (44.3%) abstracts that were published subsequently in manuscript form. The rate of abstract to manuscript publication varied among the different organizations (Table 1), with abstracts presented at the SAEM Annual Meeting most likely to progress to manuscript (72/135; 53.3%). Manuscripts appeared in a variety



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Figure 2. EMS Abstracts by Topic and Publication Status Abbreviation: EMS, Emergency Medical Services.

of peer-reviewed journals (Figure 1), including *Prehospital Emergency Care* (35%), *Academic Emergency Medicine* (12%), and *Resuscitation* (10%).

The topics most commonly presented in abstract and full publication form were related to EMS Systems, Airway, Trauma, and Cardiac Arrest, although number of abstracts and frequency of subsequent manuscript publications were not correlated. Among the topics least likely to be presented were Geriatrics and Neurology. However, Geriatrics was the most likely topic (69%) and Neurology was the least (25%) likely topic to be published in manuscript form following abstract presentation; both topics had relatively small numbers of studies (Figure 2).

The mean time to manuscript publication was 22.2 months (SD = 16.5 months, range = 0-94 months), with the majority appearing in journals within the first three years, and very few published after five years (Figure 3).

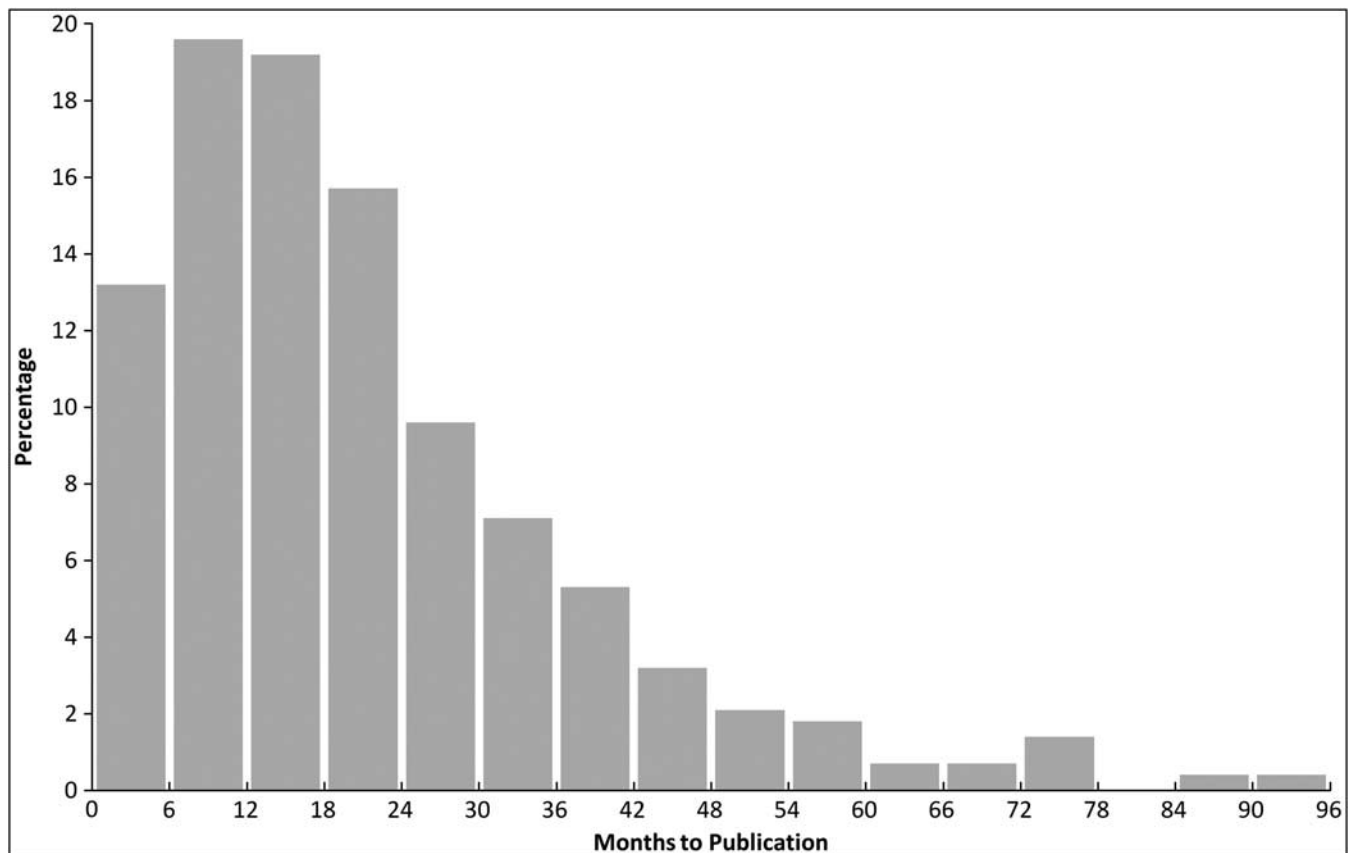
Discussion

The total abstract to manuscript publication rate of EMS-related abstracts presented at five national conferences over a 3-year period was 44.3%. Although this demonstrates that less than half of the EMS abstracts will ever result in manuscript publication, previous research on this topic indicates that this is better than the abstract to manuscript publication rate for general EM.¹⁷⁻²¹

The SAEM Annual Meeting had the highest rate of publication, with more than half of the abstracts published annually, and a 3-year publication rate of 53.7%. This was followed closely by the ACEP Scientific Assembly, where the publication

rate reached 48.2%. Both of these annual conferences invite participants and research from all areas within the field of EM, yet the publication rate for EMS abstracts presented at these meetings was higher than the publication rate at each of the three EMS-specific conferences. One explanation for this observation may relate to the type of presenters encountered at the different meetings. For example, SAEM membership is composed of academic emergency physicians who are likely to have a greater desire to publish, resulting in the higher observed publication rate. Additionally, the ACEP and SAEM conferences are open to the entire field of EM, and the competition for abstracts overall may result in selection of higher quality abstracts for presentation that are more likely to be published subsequently in manuscript form.

Emergency medicine is a broad and diverse specialty requiring an extensive knowledge base and familiarity with most other medical fields. Emergency medical providers, including physicians, midlevel providers, nurses, and EMS personnel, encounter a variety of medical and surgical complaints in clinical practice, and the diversity of the EM and EMS literature reflects this. Certain topics were studied more frequently than others, but the rate of publication was not associated with the frequency of presentation. For instance, EMS Systems was the most frequently presented EMS abstract topic among all the conferences, but only 32% of abstracts were subsequently published as manuscripts. By contrast, abstracts related to Geriatrics were comparatively few, but had a 69% publication rate. There was no demonstrable relationship between the number of abstracts related to a specific topic and the likelihood of publication.



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Figure 3. Time between Abstract Presentation and Manuscript Publication in Months

The mean time to manuscript publication following abstract presentation was 22.2 months, with the majority of publications occurring within the first three years. The delay of nearly two years from presentation to publication may be due to several factors, including time required for manuscript preparation, competing research and clinical priorities, the journal peer-review process, and in some cases, the need to complete the study. Publication rates dropped significantly after 30 months, and very few studies were published five or more years after their initial abstract presentation. This finding highlights the need to encourage early preparation and submission of manuscripts in order to maximize publication potential.

Studies in other fields of medicine have identified certain study characteristics associated with abstract to manuscript publication rates. The presentation format has been shown to be related to subsequent publication, with oral abstract presentations more likely than poster presentations to go on to press.^{18,22-24} Randomized controlled trials (RCTs) are traditionally thought to be the gold standard of study designs, and have previously been shown to have the highest abstract to publication rate.²⁵ However, RCTs are conducted less frequently than observational and basic science studies.²⁵

Limitations

The current study is primarily limited by the very nature of abstracts, which are simply summaries of the study design and results. While the significant information is concisely presented, the details are specifically withheld for the sake of brevity. Therefore, some of the abstracts reviewed lacked enough

information to make a definitive classification of study design, methodology, or results and were difficult to categorize. The study protocol had initially included identifying the study design used in the various abstracts, but many abstracts were too ambiguously written to reliably sort them in this manner.

It is possible that certain manuscripts were missed and not identified in this analysis, which would lead to an underestimation of publication rates. By using two reviewers and multiple search strategies, this source of error was minimized. Some researchers publish multiple abstracts and manuscripts based on the same or similar topics and data sets. It is possible that this could lead to an overestimation in publication rates as manuscripts could have been attributed mistakenly to abstracts. Adhikari et al found lower rates of EMS publications for SAEM and ACEP than this study did.²⁶ Part of this discrepancy may be attributable to the longer time frame from abstract presentation to PubMed search in the current study. The current study also did not examine the abstract to publication rate for non-EMS presentations at the conferences, and therefore, cannot draw conclusions about the rate of publication of EMS vs non-EMS studies. Lastly, the current study was not designed to assess the reasons for nonpublication or delay in publication. While explanations based on previous research¹⁰ and personal experience can be offered, individual motive and external factors are beyond the scope of the current study.

Conclusion

Fewer than half of EMS abstracts presented at five major national conferences were published subsequently as manuscripts in peer-reviewed medical journals. This may represent missed opportunities

for research and clinical growth as a medical subspecialty. Further research should focus on ways to increase opportunities and eliminate barriers to publication.

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