

# Abstract Presentations by Residents at an Intramural Research Day: What Factors Affect Publication?

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**OBJECTIVE:** To assess the rate of conversion of scientific abstracts presented at an intramural resident research day to published articles and identify the factors associated with successful conversion.

**DESIGN:** Retrospective cohort study.

**SETTING:** Johns Hopkins Hospital, Department of Plastic Surgery.

**PARTICIPANTS:** Evaluation of 78 abstracts presented by plastic surgery residents as part of an intramural research day over a 5-year period.

**RESULTS:** A total of 78 abstracts were presented by residents over the study period. Most abstracts (49, 63%) were presented by senior residents (postgraduate year  $\geq 4$ ). Fifty-six abstracts (72%) were clinical studies. The majority (54, 69%) of primary investigators had an academic rank of associate professor or professor. Fifty abstracts (64%) were subsequently published in a peer-reviewed journal. The mean time to publication was  $15.6 \pm 13.6$  months. In a logistic regression model, abstract conversion was inversely associated with increasing postgraduate year (odds ratio = 0.56, 95% CI: 0.36-0.85,  $p = 0.007$ ) and directly associated with primary investigator academic rank (odds ratio = 3.3, 95% CI: 1.1-10.5,  $p = 0.047$ ).

**CONCLUSIONS:** The conversion rate of abstracts to published articles from an intramural resident research day is  $>50\%$  and is associated with increased time until graduation and primary investigator academic rank. These results suggest that research exposure early in surgical training and experienced mentorship are key elements to successful education in surgical research. (*J Surg* 72:566-571. © 2015 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

**KEY WORDS:** plastic surgery milestones project, research productivity, resident research, practice-based learning, systems-based practice

**COMPETENCIES:** Interpersonal and Communication Skills, Practice-Based Learning and Improvement, Systems-Based Practice

## INTRODUCTION

Education in and practical application of the principles of scientific investigation are important components of surgical training. A recent collaboration between the American Board of Plastic Surgery and the American Council for Graduate Medical Education, as part of the Plastic Surgery Milestone Project, established milestones for research and teaching in the context of practice-based learning and improvement.<sup>1</sup> Higher level performance in this milestone relates to a resident's ability to critically appraise published research, formulate and investigate a research question, and successfully communicate the findings to the surgical community.

One method for dissemination of ideas, innovations, and findings from clinical or basic science investigations is via local, regional, national, or international meetings. Although such presentations can have a dramatic effect on a field of study, a measurable standard for achievement in investigation is publication of a peer-reviewed manuscript. In this regard, the conversion of a scientific abstract to a published article is one metric that could be used to assess the success of a particular research endeavor. For academic surgeons, the number of peer-reviewed publications is a commonly used barometer for academic productivity. For surgical trainees, education in the science and practice of basic and clinical investigation can be a potential catalyst for an academic career. Publication of a peer-reviewed manuscript can, in this context, be a measure of competency in scientific investigation.

Historically, conversion rates for scientific abstracts to published articles in surgical specialties are low, with most studies

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reporting conversion rates <50%. Most studies have focused on the conversion rates for abstracts presented at regional or national meetings. The conversion of abstracts to published articles in the orthopedic surgery literature ranges from 33% to 50%.<sup>2-3</sup> Patel et al.<sup>4</sup> reported a conversion rate of 33% in the neurosurgical literature. Several studies in the urologic literature have reported similar rates (30%-50%).<sup>5-7</sup> Commonly cited barriers to publication have been time and interest of coauthors. Reported factors associated with successful conversion are higher quality studies, prior research experience by the presenting author, and senior author academic rank.<sup>2-8</sup>

The purpose of this study was to assess the conversion rate of abstracts presented at an intramural resident research day. We hypothesized that most presented abstracts would be converted to published articles. Regarding this hypothesis, our specific aims were to (1) identify abstracts presented by plastic surgery residents as part of an intramural research day over a 5-year period, (2) identify publications associated with presented abstracts, (3) compute the conversion rate for publication, and (4) identify factors associated with conversion of an abstract to a publication in a peer-reviewed journal.

## MATERIALS AND METHODS

### Study Design/Sample

This was a retrospective cohort study. The study sample was identified by reviewing abstract submissions from the annual Johns Hopkins Hospital/University of Maryland Plastic Surgery Research Day over a 5-year period (2009-2013). This program-wide research day allows residents the opportunity to submit abstracts pertaining to research work they have completed during the course of clinical training or during a dedicated research year. Abstract presentations follow an oral-presentation format, where the presenter is given 5 to 7 minutes to discuss their work, followed by an open question session on the topic area with expert panelists and the audience at large. Abstracts were included in the sample if the presenting author was a plastic surgery resident in the Johns Hopkins Hospital/University of Maryland program. Residents were limited to one abstract submission per year. Abstracts presented by faculty, clinical fellows, research fellows, and medical students were excluded from the analysis, as were abstracts pertaining to research completed outside of the plastic surgery residency program. The time period selected was done to allow for at least 18 months of time between the intramural research day and data acquisition, to account for the time for manuscript preparation and publication. Institutional review board approval was granted for this study (Protocol # IRB00056521).

### Study Variables

Study predictor variables were factors postulated to be associated with conversion of abstracts to published articles and were

classified as presenter-specific and abstract-specific measures. Presenter-specific measures were resident level (postgraduate year [PGY]), residency track (independent vs integrated— independent-track residents are those who are completing plastic surgery training after completing a residency in general surgery, otolaryngology, oral and maxillofacial surgery, orthopedics, etc., whereas integrated residents are those who match into plastic surgery directly from medical school), and number of prior publications by presenting author. Abstract-specific measures were type of study (clinical research vs basic science), research topic (general reconstructive surgery, breast surgery, basic science/allograft transplantation, craniomaxillofacial surgery, or hand and extremity surgery), academic rank of faculty investigator (part-time faculty, assistant professor, associate professor, and professor), and number of prior publications of primary investigator.

The primary outcome variable was successful conversion of a presented abstract to a published article in the peer-reviewed literature. Identification of published articles was completed as follows: MedLine (National Center of Biotechnology Informatics, <http://www.ncbi.nlm.nih.gov>) and Scopus (<http://www.scopus.com>, Elsevier, Inc., London, UK) were searched for articles corresponding to the presented abstracts. The search was completed in several different ways to maximize inclusion. First, the title of the presented abstract was used as a search parameter. Search results were compiled and compared with the presented abstract. If an exact match was not found, the listed authors and materials and methods were compared so as to verify that the article corresponded to the presented abstract (the results and conclusions were not compared because of the potential for change in the process of manuscript preparation). If there was no article identified by this method, a second search was conducted, first using the presenting author's and subsequently the primary investigator's names. The listed authors and methods were compared so as to ensure correlation between the abstract and the article. For instances where multiple abstracts corresponded to a single article, only the first abstract was counted as published. Secondary outcome measures were time to publication (months) and journal type.

### Statistical Analysis

Data were collected and iteratively entered into a commercially available statistical database program (SPSS v.20.0, SPSS Inc., Chicago, IL). Descriptive and bivariate statistics were computed to provide a summary for the sample and to identify associations between the predictors and outcomes. A multiple logistic regression model was computed to identify factors associated with positive conversion of an abstract to a published article. Kaplan-Meier/Cox proportional hazards analyses were used to identify factors associated with time to publication. For all analyses,  $p \leq 0.05$  was considered statistically significant.

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