Research Square

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Trends in Leadership at Trauma Orthopaedic Fellowships

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Abstract

Introduction:

Orthopaedic trauma surgery has experienced substantial growth over the past two decades, with fellowship programs increasing from 34 in 2003 to 66 by 2025. Thus, leadership expansion has occurred namely creating the Fellowship Program Director (FD) role to aid clinical education and academic productivity. Despite the importance of this role, objective data describing the demographics, academic metrics, and training pathways of orthopaedic trauma fellowship directors are limited. This study aims to characterize these factors to better understand pathways to leadership and common traits within orthopaedic trauma surgery.

Methods

Fellowship programs were identified using the Orthopaedic Trauma Association directory. Publicly available sources including program websites, Doximity, and LinkedIn were reviewed for sex, degree type, training institutions, and career history. Scopus was used to collect publication count and H-index. Data collection occurred in early 2026 (n = 69 FDs). IRB approval was not required for this study.

Results

Of 69 FDs, 66 (96%) held MD degrees and 3 (4%) held DO degrees. 64 (93%) were male and 5 (7%) female. FDs demonstrated substantial academic productivity, with a mean of 83 publications (median 60; range 4–401) and a mean H-index of 20 (median 20; range 2–59). Training pathways were heterogeneous at the undergraduate, medical school, and residency levels, with minimal institutional retention between stages. Fellowship training demonstrated greater concentration, most commonly at Harborview Medical Center/University of Washington (n = 7), Florida Orthopaedic Institute (n = 6), Carolinas Medical Center (n = 5), and University of California Davis (n = 4).

Discussion

Orthopaedic trauma fellowship directors are predominantly male, MD-trained surgeons with strong academic productivity. Early training pathways are diverse, whereas fellowship training is concentrated among a small number of high-volume academic trauma centers, suggesting centralized subspecialty refinement may play a key role in leadership attainment.

Introduction

As treatment for orthopaedic-related injuries has become increasingly complex, the field of orthopaedic surgery has responded by emphasizing and growing subspecialty programs and fellowships. This

expansion in training programs within the specialty has increased the need for quality fellowship program directors (FDs) and educational leadership positions in orthopaedics[1, 2, 3]. The role of a FD is to oversee accreditation, operative education, clinical decision-making, mentorship, and scholarly development. This position is often filled by individuals with vast clinical expertise, leadership experience, administrative skills, and a substantial research background.

Recent work on orthopaedic educational leadership has shown that these positions are held disproportionately by men and are commonly associated with substantial academic productivity[2–5]. Across eight orthopaedic subspecialties, fellowship directors had a mean h-index of 18.6, and only 5.6% were women[4]. Broad analyses of orthopaedic fellowship leadership have also shown that women remain underrepresented across subspecialties, leading 4.7% of fellowship programs overall, while in trauma specifically women led 6.2% of programs and 5.1% of fellowship positions[7]. Trauma-specific leadership data specifics remain limited. This disparity is consistent with trauma workforce studies showing that women remain underrepresented in Orthopaedic Trauma Association membership and senior OTA leadership, even as female representation among trauma fellows has increased over time[8–10].

Taken together, the available literature suggests that orthopaedic trauma leadership is shaped by academic productivity, concentrated fellowship pedigree, and persistent diversity gaps, but contemporary data on current trauma fellowship directors remain sparse[4, 6]. The purpose of this study was to characterize the demographics, academic productivity, and training pathways of current orthopaedic trauma fellowship directors in the United States. Ultimately, this study seeks to provide insight into the different factors associated with attaining leadership roles within orthopaedic trauma surgery, providing a framework to guide physicians and residents who have the goal of attaining this position in the future.

Methods

This study did not go through The Institutional Review Board as all data was sourced from publicly available websites. Programs were identified using the Orthopaedic Trauma Association (OTA) fellowship directory. As of October 2025, there were 69 program directors listed. Information was gathered via author review in early 2026 and year calculations were based on the current year as 2026. The demographic data of interest for each FD included sex, physician degree type (MD vs DO), former residency and fellowship training locations, each individual's H-index and total documents published, and details about their career, current institution, and title. Primary websites included Healthgrades, Doximity, LinkedIn, usnews, and program websites. To obtain the individual H-index and total documents published for each FD, the Scopus data-base (Elsevier BV, Waltham, MA) was queried to access their research-specific information. This database has a search engine feature that operates through an extensive repository of peer-reviewed scientific literature with a citation-tracking component. Scopus was used to retrieve the H-index for every FD in the study.

Pearson correlation coefficients were calculated using Statistical Analysis System software (SAS version 9.4; SAS Institute Inc., Cary, NC). Correlation strength was interpreted in accordance with Mukaka's guidelines.[1] Coefficients < 0.3 were considered negligible, 0.3–0.5 low, 0.5–0.7 moderate, 0.7–0.9 high, and > 0.9 very high.

Results

Demographic Data

Of the 69 FDs included in the analysis, 66 (96%) held an MD degree and 3 (4%) held a DO degree. This distribution differs from the national physician workforce, in which approximately 85–90% are MDs and 10–15% are DOs. Additionally, 64 fellowship directors (93%) were male and 5 (7%) were female.

Institutions Attended

Analysis of training institutions for FDs are located in Table 1, including frequency of institutions attended, institution loyalty, and US versus internationally based programs. The data for FD undergraduate alma maters was gathered for 60.8% (n = 42). Of these, only 5 were attended by more than one FD. Data regarding medical school attended were obtained for 100% (n = 69) of FDs. Of these, the highest frequency attended were University of Cincinnati College of Medicine (n = 4) and Duke University School of Medicine (n = 3). For residencies attended, data was gathered for 97.1% (n = 67) of FDs. Of these, the highest frequency attended were University of Pittsburgh and University of Cincinnati (n = 3). For fellowships attended, data was gathered for 95.6% (n = 66) of FDs. Of these, the highest frequency attended were Harborview Medical Center / University of Washington (n = 7), Florida Orthopaedic Institute (Tampa) (n = 6), Carolinas Medical Center (n = 5), and University of California Davis (n = 4). For FDs that attended an institution more than once, 2.9% (n = 2) attended the same institution from undergraduate to medical school, 11.6% (n = 8) attended the same institution for medical school and residency, fellowship retention from residency was 2.9% (n = 2), and none attended the same institution for all four.

Table 1

Schools where more than two PDs attended the same school for medical school, residency, or fellowship

Medical Schools (N = 69)	Residencies (N = 67)	Fellowships (N = 66)
Attended by 4 FDs: ● University of Cincinnati College of Medicine Attended by 3 FDs: ● Duke University School of Medicine	Attended by 3 FDs: ● University of Pittsburgh ● University of Cincinnati	Attended by 7 FDs: ● Harborview Medical Center / University of Washington Attended by 6 FDs: ● Florida Orthopaedic Institute (Tampa) Attended by 5 FDs: ● Carolinas Medical Center Attended by 4 FDs: ● University of California Davis Attended by 3 FDs: ● University of Maryland / R Adams Cowley Shock Trauma Center ● Hospital for Special Surgery

Research Experience

Bibliometric analysis using Scopus demonstrated that FDs had a mean of 83 publications, with a median of 60. The number of publications ranged from 4 to 401. Next evaluation of the fellowship directors H-indexes were completed. An H-index measures a researcher's productivity and citation impact by identifying the highest number (*h*) of papers that have each been cited at least (*h*) times. Fellowship directors demonstrated a mean H-index of 20 and a median of 20, with values ranging from 2 to 59.

Career Timeline

Undergraduate graduation year data were available for 19 fellowship directors (19.8%), with a mean graduation year of 1998 and a median of 2000 (± 8 years). Medical school graduation year information was identified for 55 fellowship directors (57.3%), yielding a mean graduation year of 2001 and a median of 2003 (± 9 years). First fellowship graduation year data were available for 39 fellowship directors (40.6%), with a mean of 2009 and a median of 2010 (± 7 years). Second fellowship graduation year information was available for 9 fellowship directors (9.4%), demonstrating a mean graduation year of 2010 and a median of 2012 (± 9 years).

Table 2
Education Timelines for Orthopaedic Trauma Fellowship Program Directors

Educational Timeline	Undergraduate	Medical School	First Fellowship	Second Fellowship
N	19/69 fellowship directors (19.8%)	55/69 fellowship directors (57.3%)	39/69 fellowship directors (40.6%)	9/69 fellowship directors (9.4%)
Mean	1998	2001	2009	2010
Median	2000	2003	2010	2012
Range	1977–2009	1968–2014	1989–2021	1996–2020

Educational Timeline

As shown in Table 2, educational timeline data were variably available among fellowship directors. Undergraduate graduation years were identified for 19 directors (19.8%), with a mean graduation year of 1998, a median of 2000, and a range of 1977–2009. Medical school graduation years were available for 55 directors (57.3%), demonstrating a mean of 2001, a median of 2003, and a range of 1968–2014. First fellowship graduation years were identified for 39 directors (40.6%), with a mean of 2009, a median of 2010, and a range of 1989–2021. Data regarding completion of a second fellowship were available for 9 directors (9.4%), with a mean graduation year of 2020, a median of 2012, and a range of 1996–2020. Overall, the available data suggest that most current orthopaedic trauma fellowship directors completed their medical training and subspecialty fellowship training during the early 2000s and early 2010s, respectively.

Extracurriculars

For this study, extracurricular analysis included non-medical graduate school degrees, secondary fellowships outside of orthopaedic trauma surgery, and whether FDs had held a presidential position in a professional orthopaedic society. For 8/69 FDs public information indicated that they pursued a non-medical graduate degree. The distribution of non-medical graduate degrees pursued was 2 MPH, 2 MBA, 2 MS, and 1 PhD, 1 MSc. There was also variation in the time in their career when FDs chose to earn their graduate degree. Most chose to go to graduate school between their undergraduate education and medical school, but some pursued these degrees later in their education/career. 9/69 FDs pursued a second fellowship in addition to their 5 years of residency and 1 year of orthopaedic trauma fellowship. Secondary fellowship varied widely between FDs with oncology, joints, upper extremity, and lower extremity being some of the subspecialties. 5/69 FDs were listed to have been current or previous president of a professional orthopaedic society. 4/5 of these FDs were president of Orthopaedic Trauma Association, OTA, at some point in their career. 3/5 FDs have held more than one position as a president with other organizations including Orthopaedic Research Society (ORS), International Combined Orthopaedic Research Societies (ICORS), J. Robert Gladden Society, and Küntscher Society for Intramedullary Nailing. These societies have national or international scope.

Discussion

This study takes a comprehensive look into leadership demographics, academic productivity and training pathways among orthopedic trauma fellowship directors in the United States. The findings reveal that current fellowship directors are predominantly male (93%) and MD trained, with substantial research productivity (mean 83 publications, mean H-index of 20).

The training pathways taken by current fellowship directors demonstrate significant geographic varied and institutional diversity. The undergraduate institutions and medical schools attended varied across the country and world, spanning small private schools to large public universities. However, fellowship training showed concentration at a small number of nationally recognized trauma centers, Harborview Medical Center/University of Washington, Florida Orthopaedic Institute, and Carolinas Medical Center, which collectively trained over one fourth of current fellowship directors. These patterns suggest that where you obtain your undergraduate and medical degree has little impact on attaining fellowship director positions, whereas the location of advanced fellowship training within large academic hubs plays a decisive role.

This data also showed a marked underrepresentation of women (7%) and DO-trained physicians (4%) among fellowship directors. This is notable given that women comprise 14.1% of current orthopedic trauma surgeons and DO’s account for 14% of orthopedic surgery residency matches. These findings may reflect the demographics of earlier training eras, when there were large barriers to entry for women and DO physicians, this highlights the importance of fostering greater diversity among future leaders.

Research productivity, as measured by H-index and publication volume, appears to be a critical factor in attaining the position of fellowship director. With a mean H-index of 20 and 83 publications, fellowship directors demonstrate substantially higher metrics than typical academic orthopedic surgeons.

For aspiring fellowship directors, these findings suggest several actionable objectives to achieve this position. Pursuing fellowship training at established trauma centers who have produced current directors, maintaining consistent research productivity, and engaging in professional society involvement have shown to be important trends in today's leaders.

Future directions should focus on longitudinal tracking of leadership pathways, such as seeing how long program directors stayed with different programs and if moving programs frequently or staying with one program is beneficial. Analyzing what makes programs like Harborview Medical Center/University of Washington, Florida Orthopaedic Institute, and Carolinas Medical Center produce many fellowship directors may prove beneficial to other programs' curriculum. Lastly, an analysis of how these trends track with other subspecialties in orthopedic surgery could prove useful. Understanding these leadership trends is becoming increasingly important for workforce planning, mentorship strategies and ensuring diverse well-prepared leaders to guide the next generation of orthopedic trauma surgeons.

Declarations

Author Contribution

All authors provided substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; all authors drafted the article or revised it critically for important intellectual content; all authors gave final approval of the version of the article to be published; and all authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Data Availability

Fellowship programs were identified using the Orthopaedic Trauma Association directory. Publicly available sources including program websites, Doximity, and LinkedIn were reviewed for sex, degree type, training institutions, and career history. Scopus was used to collect publication count and H-index. Data collection occurred in early 2026 (n=69 FDs). IRB approval was not required for this study.

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