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Postgraduate Programs in Orthopaedic Surgery for Physician Assistants and Nurse Practitioners

Vasco Deon Kidd ▼ Roderick S. Hooker

Postgraduate orthopaedic programs for physician assistants (PAs) and nurse practitioners (NPs) number 14 as of 2020. To better understand the characteristics of these programs a census was undertaken. The result is that most programs are 1 year in duration and in 2019 produced 40 graduates. The role of the orthopaedic PA and NP fellow is to gain an understanding of a wide range of musculoskeletal disorders, develop procedural skills, first assist in the operating room, and facilitate management of patients and discharge throughput. PA and NP fellows work alongside categorical orthopaedic physician residents. The number of graduates from PA orthopaedic training programs is estimated at 200, spanning 20 years. The other 11,145 + PAs (99%) are trained on-the-job. For hospital systems, the employment of orthopaedic postgraduate PA and NP fellows provides value through cost management and billable services.

Introduction

The American growth of physician assistants (PAs) and nurse practitioners (NPs) has been fueled by the changing demands of the healthcare system (U.S. Department of Health and Human Services, Health Resources and Services Administration [HRSA], 2016). As of 2020, about 70% of PAs practice in specialties including surgical subspecialties whereas the majority of NPs are employed in primary care (Auerbach et al., 2020; Bureau of Labor Statistics, 2020). Annual reports from the National Commission on the Certification of Physician Assistants document that the largest surgical subspecialty employing PAs is orthopaedic surgery at 11,345 (National Commission on Certification of Physician Assistants [NCCPA], 2020). The percentage of NPs employed in orthopaedic surgery is reported to be 0.2% (400 est.) (American Association of Nurse Practitioners, 2019; Benham & Geier, 2014; Spence et al., 2019). This may be explained by the insufficient number of orthopaedic educational and training opportunities available for NPs. Yet, a majority of new graduate NPs have expressed an interest in residency programs to support their transition into clinical practice (Hart & Bowen, 2016).

Orthopaedic PAs have worked alongside surgeons since the 1970s, yet little is known about their roles,

distribution, training, and compensation (Chalupa & Hooker, 2016; Larson et al., 2011). Analysis of surveys undertaken by Physician Assistants in Orthopaedic Surgery, a specialty organization, from 2009 to 2014 reported that the majority (86%) regularly assisted in surgery. Half of the respondents reported managing patients autonomously but involved a surgeon when needed. Almost all (95%) worked in metropolitan areas (city and suburbs), and 69% were employed in single or multispecialty group practices. Approximately half were employed in general orthopaedic service and a quarter in adult reconstruction surgery or sports medicine (Chalupa & Hooker, 2016). The median salary of orthopaedic PAs in 2019 was approximately \$109,000 (\$100,000 – 120,000). The median age was 38 years and 57.4% were female (NCCPA, 2020).

Population aging with increasing musculoskeletal disorders, shortages of surgeons, and advances in surgical techniques are predictors of demand for more orthopaedic PA/NPs (HRSA, 2016). Improved data acquisition and continued analysis are needed to better understand the nature of this specialized workforce.

PA AND NP POSTGRADUATE EDUCATION

There are a large number of PA and NP postgraduate programs representing various specialties and subspecialties in the United States. The Association of Postgraduate PA Programs (APPAP) and the Association of Post-Graduate APRN Programs (APGAP) each lists a plethora of programs (appap.org and apgap.com). Some programs are located at academic medical centers (AMCs) and trainees often work alongside physician

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residents. Although many postgraduate programs offer competency-based training combined with clinical rotations and other experiential learning experiences, there remains a limited detail on the administrative and educational components of these training programs (Kidd et al., 2017; Miller et al., 2017). Additionally, there is little or no information on the sponsoring institution's rate of return on investment in postgraduate training, nor the opportunity costs of such accelerated employment. Moreover, the question of whether AMCs have sponsored orthopaedic postgraduate PA and NP programs to expand local hiring pipelines, increase retention of qualified staff, or improving attending physician and/or medical resident well-being, remains unclear. This article sets out to describe orthopaedic postgraduate training programs for PAs and NPs. Our research question centers on: What are the characteristics of these postgraduate programs for PAs and NPs?

Methods

We undertook a census of postgraduate orthopaedic programs for PAs and NPs in the United States. The sources

of information included networking, literature searches, Internet, email, and telephone. The data were organized by name, year of operation, location, class size, and degree awarded. Descriptive statistics were applied.

Results

In 2020, there were 14 postgraduate orthopaedic training programs for PAs and NPs. Six of the programs offer dual PA and NP training and eight are PA only. The programs are widespread across 12 states with three in California. The oldest is the U.S. Army/Baylor University Orthopedic Physician Assistant Residency program in Fort Sam Houston, Texas (inaugurated in 1989), followed by Arrowhead in 1994 (Chalupa & Marble, 2017; Kidd et al., 2017). The fellowship duration is 12 months except the Army is 18 months. The median number of enrollees is two (range is 1–8) (see Table 1). Twelve programs offer a certificate whereas the Army confers a doctoral degree at graduation and Arrowhead Orthopaedics offers an optional doctoral degree track through the University of Lynchburg (Kidd, 2018).

TABLE 1. POSTGRADUATE ORTHOPEDIC PROGRAM FOR PHYSICIAN ASSISTANTS AND NURSE PRACTITIONERS

Program	Location (Year Inaugurated)	Eligible	Duration	Class Size per Year	Degree Awarded
<i>Arrowhead Orthopaedics/ARMC—Orthopedic Surgery PA Fellowship Program</i>	Colton, CA (1994)	PAs and NPs	12 months	6–8	Certificate and/or doctorate
<i>Carilion Clinic Orthopaedic Surgery NP & PA Fellowship</i>	Roanoke, VA (2016)	PAs and NPs	12 months	2	Certificate
<i>Illinois Bone and Joint Institute</i>	Park Ridge, IL (1996)	PAs	12 months	5-7	Certificate
<i>UCSF Fresno</i>	Fresno, CA (2016)	PAs	12 months	2	Certificate
<i>University of Rochester Medical Center</i>	Rochester, NY (2017)	PAs and NPs	12 months	2	Certificate
<i>Riverside University Health System Medical Center Orthopaedic Surgery Physician Assistant Fellowship Program</i>	Moreno Valley, CA (2010)	PAs	12 months	3	Certificate
<i>Texas Children's Hospital Orthopedic Surgery Physician Assistant Fellowship Program</i>	Houston, TX (2016)	PAs	12 months	1–2	Certificate
<i>Wake Forest School of Medicine Departments of Orthopaedic Surgery and PA Studies Postgraduate Orthopaedic Surgery PA Fellowship (OPAF)</i>	Raleigh, NC (2015)	PAs	12 months	3	Certificate
<i>The Medical College NP and PA Post-graduate Orthopaedic Fellowship</i>	Wisconsin (2019)	PAs and NPs	12 months	1	Certificate
<i>The Advanced Practice Provider (APP) Orthopedic Fellowship Postgraduate Program</i>	Ohio (unknown)	PAs and NPs	12 months	Unknown	Certificate
<i>Duke University Physician Assistant Orthopedic Residency Program</i>	North Carolina (2012)	PAs	12 months	1	Certificate
<i>Atlanta & Mercer University Physician Assistant Orthopedic Surgery Residency Program</i>	Atlanta, GA (2018)	PAs	12 months	Unknown	Certificate
<i>The Northwell ACP (PA & NP) Fellowship in Orthopedics</i>	New York (unknown)	PAs and NPs	12 months	Unknown	Certificate
<i>U.S. Army/Baylor University Orthopedic Physician Assistant Residency</i>	Texas (1989)	PAs	18 months	6–8	Doctorate

Note. NP = nurse practitioner; PA = physician assistant.

Most of the postgraduate programs are associated with teaching hospitals and 64% are affiliated with a university, 7% with a private medical school. The vast majority of programs provide clinical and didactic training in orthopaedic trauma, foot and ankle surgery, total joint surgery, sports medicine surgery, upper extremity surgery, and spine surgery. In total, 14 programs produce 40 graduates annually. These programs offer varying levels of support, ranging from stipends, continuing medical education allowance, liability insurance, and other employment benefits.

A RATIONALE FOR A POSTGRADUATE PROGRAM FOR PAs AND NPs

The reason most often mentioned for inaugurating a PA/NP postgraduate program in orthopaedics was a skilled labor shortage. For example, the Illinois Bone and Joint PA program, started in 1996, was a response to the MD orthopaedic residency program at Northwestern University pulling out of Lutheran General Hospital (personal communication, Patrick Knott, November 2020). The Baylor Army program started in 1989, due in part to difficulty recruiting board-certified surgeons (Chalupa & Marble, 2017). The Arrowhead Orthopaedic Surgery PA Fellowship Program structured as a PGY-2 equivalent was initiated to provide more emergency department, inpatient unit, and operating room coverage (Kidd, 2019).

STIPENDS FOR TRAINEES

All of the postgraduate programs provide a stipend (except the Army where students are commissioned officers on active duty). The majority of postgraduate programs offer a stipend equivalent to PGY 1-2 orthopaedic surgery residents. Stipends typically range from \$50,000 to \$80,000 (2020 dollars).

POSTGRADUATE EDUCATION PROGRAM BENEFIT

The economic benefit of incorporating PAs and NPs in a postgraduate specialty program remains to be detailed and promulgated. Respondents from this survey reported that the services of a PA could be billed when an MD resident is unavailable, which produces a partial return on investment. Payer rules and regulations vary and influence how programs bill for the services of their PA/NP trainees. Not all third-party payers follow Medicare guidelines when billing for PA and NP services. Since routine tasks were often delegated by the attending surgeon, such tasks offset the higher salary costs of a surgeon. The consensus was that billable services counterweighed the compensation and benefits of employing a PA or NP as a fellow.

ROLE OF TRAINEES

The bulk of the postgraduate PA and NP trainee workload is in managing the inpatient units, providing inpatient and emergency department consults, assisting in the operating room, and as staff participating in fracture and/or subspecialty clinics. Other roles include bedside procedures, preadmission examination, patient history, review of medical records, and postsurgical

visits. The PA also assists in discharge planning and patient transfer to a rehabilitation center.

EMPLOYMENT FOLLOWING GRADUATION

Without exception, all graduates were reported to be employed in orthopaedic surgery groups or multispecialty medical organizations. One report was that Kaiser Permanente hired Arrowhead Orthopaedic trained PAs at a higher rate than entry-level. However, differences in salary between orthopaedic fellowship trained NPs and PAs and those trained informally have not been published.

ACCREDITATION

Although postgraduate training for PAs and NPs does not require independent accreditation, several orthopaedic surgery programs have expressed interest in pursuing accreditation from either the Accreditation Review Commission on Education for the Physician Assistant (ARC-PA) or from the American Nurses Credentialing Center (ANCC). It should be noted that graduation from a nonaccredited postgraduate program does not affect employment rates for trainees. Additionally, there is no broad consensus across programs regarding standardized curricula or expected competencies (Miller et al., 2017).

APPLICATION REQUIREMENTS

The requirements for application for PAs and NPs in a postgraduate education program include the following:

- Graduated from a PA program approved by the Accreditation Review Commission on Education for the Physician Assistant.
- National Certification by the NCCPA. New graduates may receive acceptance into the program, pending successful completion of the PA National Certifying Examination.
- Completion of an accredited nurse practitioner master's or doctoral program prior to the start of the fellowship.
- National board certification as an acute care nurse practitioner, family nurse practitioner, or adult-geriatric nurse practitioner.
- Current PA or NP license from the state where the fellowship resides.
- Drug Enforcement Administration (DEA) license.
- Most postgraduate programs require a graduate degree (all PA and NP programs in the United States confer a graduate degree).
- Letters of recommendation from an educator and/or a collaborating physician.
- Current curriculum vitae.

Discussion

Fourteen postgraduate programs have been developed to train PAs and NPs in orthopaedics. Most of the programs are 12 months in duration and produce a certificate of completion. All were operational in 2019, prior to the COVID-19 pandemic, with some suspending or reducing their operation until mid-2021.

Various hypotheses for initiating postgraduate specialty programs for PAs and NPs have been advanced. Financially, medical and surgical team training programs improve patient throughput, reduce length of stay, and indirect costs (Hiza et al., 2015). In terms of productivity, their addition on orthopaedic teams increases output in annual joint replacement surgery (Bohm et al. 2010).

The inclusion of PAs and NPs in orthopaedics, as well as other multispecialty disciplines, has not gone unnoticed by the federal government, as shortages in many specialties are significant and worsening. The supply and demand for orthopaedic surgeons are predicted to be short by 5,050 board-certified orthopaedic surgeons in 2025 (HRSA, 2016). However, the report estimated that the number of PAs in orthopaedic surgery was 8,000 in 2015 and was adequate to compensate for this shortfall (HRSA, 2016). The 2020 annual NCCPA report identified over 11,345 certified PAs in orthopaedic surgery.

Historically, PA/NP postgraduate fellowships are not common. As for the cadre of PAs practicing in orthopaedic surgery, almost all were on-the-job trained (OJT) and not through a formal postgraduate program (Dower & Christian, 2009). Formal PA postgraduate education began in 1973 and the first NP postgraduate program started in 2007 (Heinrich et al., 1980; Martsof et al., 2017). This supply appears to be in response to demand based on a growing gap in the U.S. physician labor force (Zhang et al., 2020). One observation is that postgraduate education provides a steady supply of skilled staff for hospitals where a shortage of physician house officers exists.

What has been noted to date about this educational shift in postgraduate fellowships is that applications are competitive, and satisfaction of program directors is high (Kidd 2019; Klimpl et al., 2019). It is estimated that slightly over 200 PAs attend postgraduate training programs annually.

In summary, the development of PA and NP orthopaedic postgraduate programs is a resource allocation in AMCs. As a result of this census and other observations, the stage is set for exploring programmatic characteristics of PA/NP postgraduate programs. The need to understand these new clinical activities should span research on wages between fellowship-trained and OJT PA/NPs, quality of the experience by staff and students, and the rate of return on investment for the sponsoring institution and the fellow. As more PA and NP orthopaedic programs come on-line, it will be important to identify a set of core orthopaedic competencies and desired outcomes for this investment. Moreover, the development of an overarching conceptual framework for assessing key competences is also warranted.

LIMITATION

The greatest limitation of this project was missing data. The survey was conducted in November 2020, during the SARS-CoV-2 pandemic. Obtaining information was uneven since some programs had temporarily suspended clinical operations for students and residents. However, the strength in this survey is that the

postgraduate orthopaedic PA and NP fellowships is larger than has been reported.

Conclusion

Orthopaedic postgraduate training of PAs and NPs is an emerging American education activity and appears to be successful based on trend analysis. Although the overwhelming majority of PA/NPs in orthopaedics have learned their skills on the job, a few hundred hold postgraduate certificates of more formal experience. Further research is needed to understand PA and NP postgraduate education in terms of investment, satisfaction, deployment, utility, opportunity cost, and perceptions of graduates' preparedness for practice.

REFERENCES

- American Association of Nurse Practitioners. (2019). *The State of the Nurse Practitioner Profession: 2018*. Results from the National Nurse Practitioner Sample Survey. Author.
- Auerbach, D. I., Buerhaus, P. I., & Staiger, D. O. (2020). Implications of the rapid growth of the nurse practitioner workforce in the US. *Health Affairs*, 39(2), 273–279. <https://doi.org/10.1377/hlthaff.2019.00686>
- Benham, A. J., & Geier, K. A. (2014). Preparing nurse practitioners to provide orthopedic primary care. *Journal for Nurse Practitioners*, 10(8), 603–606. <https://doi.org/10.1016/j.nurpra.2014.04.015>
- Bohm, E. R., Dunbar, M., Pitman, D., Rhule, C., & Araneta, J. (2010). Experience with physician assistants in a Canadian arthroplasty program. *Canadian Journal of Surgery*, 53(2), 103–108.
- Bureau of Labor Statistics. (2021). *Occupational employment statistics: Occupational employment and wages, May 2017: 29-1161 nurse midwives*. Author. <https://www.bls.gov/oes/2020/>
- Chalupa, R. L., & Hooker, R. S. (2016). The education, role, distribution, and compensation of physician assistants in orthopedic surgery. *Journal of the American Academy of Physician Assistants*, 29(5), 1–7. <https://doi.org/doi:10.1097/01.jaa.0000482318.38700.d1>
- Chalupa, R. L., & Marble, W. S. (2017). A history of US Army PAs. *Journal of the American Academy of Physician Assistants*, 30(11), 39–43. <https://doi.org/10.1097/01.JAA.0000525910.74978.89>
- Dower, C., & Christian, S. (2009). Physician assistants and nurse practitioners in specialty care: Six practices make it work. <http://www.chcf.org/~media/MEDIA%20LIBRARY%20Files/PDF/PDF%20N/PDF%20NPPAModels.pdf>
- Hart, A. M., & Bowen, A. (2016, July 18). *New nurse practitioners' perceptions of preparedness for and transition into practice*. <https://www.sciencedirect.com/science/article/abs/pii/S1555415516301076>
- Heinrich, J. J., Fichandler, B. C., Beinfeld, M., Frazier, W., Krizek, T. J., & Baue, A. E. (1980). The physician's assistant as resident on surgical service: an example of creative problem solving in surgical manpower. *Archives of Surgery*, 115(3), 310–314. <https://doi.org/10.1001/archsurg.1980.01380030056012>
- Hiza, E. A., Gottschalk, M. B., Umpierrez, E., Bush, P., & Reisman, W. M. (2015). Effect of a dedicated orthopaedic advanced practice provider in a Level I trauma center: Analysis of length of stay and cost. *Journal of Orthopaedic Trauma*, 29(7), e225–e230. <https://doi.org/10.1097/BOT.0000000000000261>

- Kidd, V., Tankersley, D., & Virginia Haas (2017). Postgraduate training programs: Fellowships and residencies for PAs and NPs. In G. Kayingo, & V. M. C. Hass (Eds.), *The health professions educator: A practical guide for new and established faculty*. Springer
- Kidd, V. D. (2018). The shortest path to a professional doctorate. *JBJS Journal of Orthopaedics for Physician Assistants*, 6(4), e32. <https://doi.org/10.2106/jbjs.jopa.18.00010>
- Kidd, V. D. (2019). A day in the life: Director of orthopedic surgery PA fellowship program. *JBJS Journal of Orthopaedics for Physician Assistants*, 7(2), e0042. <https://doi.org/10.2106/jbjs.jopa.18.00042>
- Klimpl, D., Franco, T., Tackett, S., Cardin, T. E., Wolfe, B., Wright, S., & Kisuule, F. (2019). The current state of advanced practice provider fellowships in hospital medicine: A survey of program directors. *Journal of Hospital Medicine*, 14(7), 401–406. <https://doi.org/10.12788/jhm.3191>
- Larson, E. H., Coerver, D. A., Wick, K. H., & Ballweg, R. A. (2011). Physician assistants in orthopedic practice: A national study. *Journal of Allied Health*, 40(4), 174–180.
- Martsolf, G. R., Nguyen, P., Freund, D., & Poghosyan, L. (2017). What we know about postgraduate nurse practitioner residency and fellowship programs. *The Journal for Nurse Practitioners*, 13(7), 482–487.
- Miller, A. N., Weiss, J. L., Hill, V. J., Lindaman, K. J., & Emory, C. L. (2017). Implementation of a postgraduate orthopaedic physician assistant fellowship for improved specialty training. *JBJS Journal of Orthopaedics for Physician Assistants*, 5(4), e31. <https://doi.org/10.2106/jbjs.jopa.17.00021>
- National Commission on Certification of Physician Assistants, Inc. (2020, July). *2019 statistical profile of certified physician assistants by specialty: An annual report of the National Commission on Certification of Physician Assistants*. Retrieved November 2020, from www.nccpa.net/research
- Spence, B. G., Ricci, J., & Mccuaig, F. (2019). Nurse practitioners in orthopaedic surgical settings. *Orthopaedic Nursing*, 38(1), 17–24. <https://doi.org/10.1097/nor.0000000000000514>
- U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. (2016). *National and Regional Projections of Supply and Demand for Surgical Specialty Practitioners: 2013-2025*. Author
- Zhang, X., Lin, D., Pfsich, H., & Lin, V. W. (2020). Physician workforce in the United States of America: Forecasting nationwide shortages. *Human Resources for Health*, 18(1), 8. <https://doi.org/10.1186/s12960-020-0448-3>