

CURRICULUM VITAE

Name: David J. Bunnell, MSHS, PA-C, DFAAPA dbunnell@umaryland.edu

EDUCATION

- 1994, Certificate - Paramedic
The Center for Emergency Medicine of Western Pennsylvania
- 2000, Bachelor of Science - Emergency Medical Services Management
MCP-Hahnemann University
- 2004, Master of Science in Health Sciences - Physician Assistant
The George Washington University
- 2020, Academic Fellowship
Physician Assistant Leadership and Learning Academy
University of Maryland, Baltimore
- 2025, Doctor of Philosophy
Health Professions Education
University of Maryland, Baltimore

BOARD CERTIFICATIONS

- National Commission on Certification of Physician Assistants (NCCPA) 2004 – present

ACADEMIC APPOINTMENTS

- 2020 – 2024 – Assistant Professor, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University
- 2024 – present – Assistant Professor, Doctor of Medical Sciences Program, Graduate School, University of Maryland, Baltimore

PROFESSIONAL POSITIONS

- 1991 – 1995, Attendant, Emergency Medical Technician, Paramedic.
East Hills Emergency Medical Services; Johnstown, PA
- 1994 – 1995, Paramedic, West End Emergency Medical Services, Johnstown, PA
- 1995 – 1996, Paramedic, Medline Ambulance Service, Pittsburgh, PA
- 1996 – 2000, Paramedic, Medical Rescue Team South Authority, Pittsburgh, PA
- 1996 – 1997, Patient Care Partner, Department of Transplantation Surgery, Children’s Hospital of Pittsburgh
- 1997 – 1998, Organ Recovery Coordinator, The Center for Organ Recovery and Education, Pittsburgh, PA
- 1999-2000, Paramedic, Scott Township Emergency Medical Services, Pittsburgh, PA
- 2000– 2001, Mobile Intensive Care Paramedic, The Valley Hospital, Ridgewood, NJ
- 2001 – 2003, Technical Intramural Research Award Fellow; Islet Cell Transplantation Non-Human Primate Studies Coordinator; NIH-Navy Transplantation and Autoimmunity Branch; National Institute of Diabetes, Digestive Disorders, and Kidney Disease; National Institutes of Health; Bethesda, MD
 - 2001-2002 – Technical IRTA

- 2002 – 2003 – research staff supporting primate protocol
- 2004 – 2005, Physician Assistant, Department of Emergency Medicine, Hospital of St. Raphael, New Haven, CT
- 2004 – 2007, Physician Assistant, Department of Surgery, Cardiothoracic Surgery and Surgical Critical Care sections, West Haven Veterans Affairs Medical Center, West Haven, CT
- 2007 – 2008, Physician Assistant, Department of Surgical Critical Care, Washington Hospital Center, Washington, DC
- 2008 – 2014, Physician Assistant, Department of Surgery, Cardiothoracic Surgery section, Washington DC Veterans Affairs Medical Center
- 2014 – 2022, Physician Assistant, Department of Medicine, Cardiac Electrophysiology section, Washington DC Veterans Affairs Medical Center
 - 2014 – 2020, full-time staff.
 - 2021 – 2022, volunteer staff
- 2020 – 2021, Director of Clinical Education, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University, Hagerstown, MD
- 2021 – 2022, Director of Assessment, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University, Hagerstown, MD
- 2022 – June 2024, Associate Program Director, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University, Hagerstown, MD
- June 2024 - present, Assistant Professor, Doctor of Medical Science Program, School of Graduate Studies, University of Maryland, Baltimore.

PROFESSIONAL LICENSURES

- 1991 – 1993, Emergency Medical Technician, Department of Health, Bureau of Emergency Medical Services, Department of Health, Commonwealth of Pennsylvania, Inactive
- 1993 – 2000, Emergency Medical Technician - Paramedic, Bureau of Emergency Medical Services, Department of Health, Commonwealth of Pennsylvania, Inactive
- 1993 – 2001, Paramedic, National Registration for Emergency Medical Technicians, Inactive
- 2004 – 2007, Physician Assistant Licensure, Department of Public Health, State of Connecticut, Inactive
 - 2004 – 2008, Controlled Substance Registration for Practitioners, Department of Public Health, State of Connecticut, Inactive
- 2007 – present, Physician Assistant, Licensure, Department of Health, Washington District of Columbia
 - 2007 – 2022, Controlled Substance Certification, Department of Health, Washington District of Columbia

OTHER PROFESSIONAL EXPERIENCE

- 2013 – present; Peer Reviewer, Journal of the American Academy of Physician Assistants; expertise in cardiac surgery, thoracic surgery, cardiology, electrophysiology
- 2013 – 2022, Editor, CardioVISION: Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery; weekly publication
- 2018, Peer Reviewer for national conference poster presentations. American Association of Thoracic Surgery Patient Safety Meeting, Boston, MA
- 2018 – 2021, Editor-in-Chief, Journal of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery
- 2019, Peer Reviewer for national conference poster presentations; cardiology, cardiothoracic surgery, and electrophysiology expert review; American Academy of Physician Assistants, Denver, CO
- 2020, Peer reviewer for national conference poster presentations; cardiology, cardiothoracic and vascular surgery, as well as electrophysiology expert review; American Academy of Physician Assistants; Nashville, TN
- 2021, Peer reviewer for national conference poster presentations; cardiology, cardiothoracic and vascular surgery, as well as electrophysiology expert review; American Academy of Physician Assistants; Philadelphia, PA
- 2021, Peer reviewer for national conference presentation proposals; career development, cardiovascular medicine, public health, surgery, and veteran's health; American Academy of Physician Assistants.
- 2021 – 2023, Peer reviewer, Journal of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery.
- 2022, Peer reviewer for national conference poster presentations; cardiology and PA professional topics; American Academy of Physician Assistants; Indianapolis, IN.
- 2022, Peer reviewer for national conference presentation abstracts Physician Assistant Education Association, San Diego, CA.
- 2023, Peer reviewer for national conference poster presentations; health professions education, cardiology, and PA professional topics; American Academy of Physician Assistants; Nashville, TN.

AWARDS

- 1999, Emergency Medical Management Student Scholarship, MCP-Hahnemann University
- 2022, PA Leadership and Learning Academy Alumni Award in recognition for exemplary contribution in advancing PA Education, Leadership, Research, and Policy, University of Maryland, Baltimore

ADMINISTRATIVE SERVICE

Institutional service

- 2013 – 2014, Surgical Critical Care Committee member, Washington DC Veterans Affairs Medical Center
- 2015, Physician Assistant Professional Standards Board member, Washington DC Veterans Affairs Medical Center

- 2019, Moderate Sedation Committee member, Washington DC Veterans Affairs Medical Center

Significant administrative roles

- 2016 – 2018, Chair, Physician Assistant Professional Standards Board, Washington DC Veterans Affairs Medical Center
- 2018 – 2020, Lead Medical Center Physician Assistant, Washington DC Veterans Affairs Medical Center
- 2022, Interim Chair, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University, Hagerstown, MD

Regional or national service

Professional organization activities

Association of Physician Assistants in Cardiothoracic and Vascular Surgery

- 2010, APACVS Leadership Fellow
- 2010 – 2017, Contributor, CardioVISION: Publication of APACVS
- 2011 – 2013, Director at Large
- 2011, Chair, Program Committee, Critical Care Conference, Washington, DC
- 2011, Member, Association Management Search Committee
- 2011 – 2021, Chief Delegate for APACVS to AAPA House of Delegates
- 2012 – 2013, Chair, Communications Committee
- 2013 – 2017, Treasurer and Chair of Finance Committee
- 2013, Member, Association Management Search Committee
- 2017, Chair, Executive Director Salary Task Force
- 2017 – 2022, Editor, CardioVISION
- 2018 – 2019, Vice President
- 2018, Chair, Physician Assistant Education Task Force
- 2020, President
- 2021, Immediate Past President
- 2021, Chair, Nominations Committee

American Academy of Physician Associates

- 2012 – 2013, Author, Atrial Kick Blog, Journal of the AAPA
- 2014, Member, Cardiovascular Risk Reduction Committee
- 2015, Member, Task Force to Revise Guidelines for State Regulation of Physician Assistants
- 2016, Member, Optimal Team Practice Task Force
- 2016 – 2018, Chair, Research and Strategic Initiatives Commission
- 2018, Member, Huddle Volunteer Team
- 2019 – 2021, Chair, Governance Commission
- 2021, Chair, House of Delegates Elections Committee
- 2021 – present, Liaison to the American Medical Association
- 2021 – present, Distinguished Fellow of the American Academy of PAs
- 2022 – 2024, Director at Large
- 2022 – 2023, Member, Internal Affairs Committee
- 2022 – 2023, AAPA Board Liaison, Research and Strategic Initiatives Commission
- 2023 – 2024, Chair, External Affairs Committee

2023 – 2024, AAPA Board Liaison, Diversity, Equity, and Inclusion Committee
2024 – 2025, Member, Health Equity & DEI Steering Task Force
2024 – 2025, Member, Research and Strategic Initiatives Commission
2024 – 2025, Chair, Artificial Intelligence Task Force
2025, President-elect

American Association of Thoracic Surgery

2016 – 2018, Member, Patient Safety Meeting Program Committee

Physician Assistants in Virtual Medicine and Telemedicine

2020, Physician Assistant Telemedicine Education Curriculum Committee

CURRENT MEMBERSHIPS IN PROFESSIONAL SOCIETIES

- American Academy of Physician Associates
- Maryland Academy of Physician Assistants
- Association of PAs in Cardiothoracic and Vascular Surgery

COMMUNITY SERVICE

- 2020 – 2021, Next Gen Bedford County: Bedford County Pennsylvania Round Table Committee on Recruiting Young Adult Healthcare Professionals.
- 2020 – 2022, Allegany County, Maryland Health Planning Coalition.
- 2021, Higher Education Day. Leadership Allegany Rising. Allegany County Public Schools. “This program for high school juniors is dedicated to providing positive change by creating a network of future leaders committed to impacting their community.” February 18, 2021.

TEACHING SERVICE

Course and curriculum development

- 2020, Telemedicine, Academic Fellow project, team curriculum development for distribution to all Maryland Physician Assistant Programs in response to a recognized need, Physician Assistant Leadership and Learning Academy, University of Maryland - Baltimore
- 2020 – 2023, Foundations of Surgery, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University
- 2020, Academic Clinical Education Elective, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University, developed curriculum in response to unavailability of Supervised Clinical Practice Education sites during the Covid-19 pandemic.
- 2020 - 2023, Population Health, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2020 - 2024, Research and Evidence Based Medicine, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2020 – 2024, Capstone Project Coordinator, Summative Course, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2021 - 2023, Developing the PA Professional I, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.

- 2021 - 2023, Developing the PA Professional II, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2021 - 2024, Developing the PA Professional III, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2023. Cardiology Section, Clinical Medicine II, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2025 – present, Evaluation, Synthesis, and Critical Appraisal of the Medical Literature, Doctor of Medical Science Program, School of Graduate Studies, University of Maryland, Baltimore.
- 2025 – present, Scholarship: Writing, Publishing, and Presenting, Doctor of Medical Science Program, School of Graduate Studies, University of Maryland, Baltimore.
- 2025, Pathophysiological Approach to Pharmacotherapeutics 1, Master of Science Physician Assistant Program, School of Graduate Studies, University of Maryland, Baltimore
- 2025, Independent Studies Course, Master of Science Physician Assistant Program, School of Graduate Studies, University of Maryland, Baltimore.

Clinical teaching

- 2020. Clinical Preceptor in Cardiology at Washington DC VAMC for students at The George Washington University PA Program.
- 2020. Preceptor in Virtual Academic Clinical Education Elective, served as preceptor to PA Students for Department of PA Medicine, College of Liberal Arts and Sciences, Frostburg State University in response to lack of Supervised Clinical Practice Experience sites during the Covid-19 pandemic.

Individual Mentorship

- 2020. APACVS Leadership Fellow Mentor - provided formal mentoring in leadership development.
- 2024. Provided mentorship to Jessica Glanz, MSHS, PA-C, Massachusetts College of Pharmacy and Health Sciences Doctor of Medical Science Student regarding research methodology to study PA expertise in Infectious Disease.

PROGRAM SERVICE

- 2020. Policy and Procedures Committee, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2020. Program Evaluation Committee, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2020 - 2023. Academic Review and Professional Progress Committee, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.

- 2020 - 2023. Assessment Committee, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2021. Chair, Principal Faculty Search Committee, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2020. Principal Faculty Search Committee member, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2021. Clinical Site Presentation to Allegany County, Maryland Board of Commissioners. June 10, 2021.
- 2021. Clinical Coordinator Search Committee member, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2021 – 2024. Faculty Advisor, Smolko-McCagh PA Student Society, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2022. Principal Faculty Search Committee member, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2022. Director of Clinical Education Search Committee member, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2022. Chair, Medical Director Search Committee, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2023 – 2024. Member, Education Committee. Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University
- 2023 – 2024. Member, Admissions Committee. Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University
- 2023 – 2024. Chair, Student Progress Committee. Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University
- 2024 – present. Member, Admission Committee, Doctor of Medical Sciences Program, School of Graduate Studies, University of Maryland, Baltimore.
- 2024 – present. Member, Curriculum Committee, Maryland Abortion and Reproductive Clinical Health (MARCH) Program, School of Graduate Studies, University of Maryland, Baltimore.

UNIVERSITY SERVICE

- 2020 - 2024. Institutional Review Board. Frostburg State University
- 2020 - 2021. Clinical Field Internship Placements Committee, Member, addressing student field placement during the Sars-Cov-2 pandemic, Frostburg State University.
- 2021. Member, PA Medicine Program Director Search Committee, Frostburg State University.

- 2022. Chair, PA Medicine Program Director Search Committee, Department of Physician Assistant Medicine, College of Liberal Arts and Sciences, Frostburg State University.
- 2022. Graduate Council, Member, Frostburg State University.
- 2023. Educational Effectiveness Assessment Committee, Preparation for Middle States Commission on Higher Education University Accreditation, Frostburg State University.
- 2023. Search Committee Member, Chief Learning Officer, PA Leadership and Learning Academy, Graduate School, University of Maryland, Baltimore.
- 2024. Member, Director of Assessment and Institutional Research Search Committee, Frostburg State University.
- 2025, Search Committee Member, Director of Strategic Partnerships & Advocacy, PA Leadership and Learning Academy, Graduate School, University of Maryland, Baltimore.
- 2025, Faculty Center for Teaching and Learning, Educator Development for Growth and Effectiveness (EDGE), mentor for University of Maryland, Baltimore faculty fellows.

GRANTS

- 2020, Co-Investigator
 - \$50,000.
 - Building a Regional Center of Excellence for Optimizing Clinical Education: A Randomized-Controlled Crossover Study of an Innovative Telehealth Model for PA Programs (The BRITE Study)
 - 2020-2021 Physician Assistant Education Association Faculty-Generated Research Grant
- 2024 – Co-Investigator
 - \$5,000.
 - Leaders in Education: Academy of Presidential Scholars (LEAPS) Grant.
 - Excellence in Health Professions Education: Establishing Nursing Faculty AI Champion Program to Elevate Teaching and Learning with Artificial Intelligence, University of Maryland, Baltimore.
 - This project grew out of a pilot study that I completed at Frostburg State University Department of PA Medicine as a part of my doctoral studies.
- 2024 – Mentor
 - \$2,500.
 - National Commission on Certification of PAs Foundation Grant.
 - Mentored PA student Isaac Esene in securing a grant to support GoodWorks, his non-profit organization dedicated to mitigating the effects of violence in Prince George’s County, Maryland. At the time, he was a PA student at Frostburg State University.
- 2024 – Educationalist, Research Analyst
 - \$10.6 million.
 - State of Maryland grant to University of Maryland, Baltimore.

- Maryland Abortion and Reproductive Clinical Health (MARCH) program which aims to advance family planning and abortion care in Maryland.
- My role is to provide insights for best practices in Health Professions Education, analyzing research data, and engaging in research dissemination.
- 2025 – Co-investigator
 - \$25,000
 - Center for Interprofessional Education at the University of Maryland, Baltimore
 - Innovating Interprofessional Education with AI: A Transgender/Gender Diverse Simulation for DNP, Medical, and PA Students

PUBLICATIONS

Peer reviewed journal articles

1. Hirshberg, B., Preston, E. H., Xu, H., Tal, M. G., Neeman, Z., Bunnell, D., ... & Harlan, D. M. (2003). Rabbit anti thymocyte globulin induction and sirolimus monotherapy supports prolonged islet allograft function in a nonhuman primate islet transplantation model. *Transplantation*, *76*(1), 55-60.
2. Tal, M. G., Hirshberg, B., Neeman, Z., Bunnell, D., Soleimanpour, S., Bacher, J., ... & Harlan, D. M. (2004). Induction of diabetes in nonhuman primates by means of temporary arterial embolization and selective arterial injection of streptozotocin. *Radiology*, *230*(1), 163-168.
3. Tal, M. G., Hirshberg, B., Neeman, Z., Bunnell, D., Soleimanpour, S., Bacher, J., ... & Harlan, D. M. (2004). Induction of diabetes in nonhuman primates by means of temporary arterial embolization and selective arterial injection of streptozotocin. *Radiology*, *230*(1), 163-168.
4. Soleimanpour, S. A., Hirshberg, B., Bunnell, D. J., Sumner, A. E., Ader, M., Remaley, A. T., ... & Harlan, D. M. (2012). Metabolic function of a suboptimal transplanted islet mass in nonhuman primates on rapamycin monotherapy. *Cell transplantation*, *21*(6), 1297-1304.
5. Bunnell, D. J. (2016). Physician assistants in cardiothoracic surgery. *JAAPA*, *29*(1), 9-10.
6. Bunnell, D. J., Dodds, J., & Dehn, R. W. (2018). Commentaries on health services research. *JAAPA*, *31*(2), 54-55.
7. Bartlett, D., Bunnell, D. J., Calcano, K., Doll, M., Fascella, D., Lizotte, D. E., Morton, A., & Sweet, K. (2019). Association of PAs in Cardiothoracic and Vascular Surgery Education Task Force Report. *JAPAVCS, Volume 1*(1), 30-34
8. Bunnell, D., & Gordes, K. L. (2021). Building a PA telehealth curriculum. *JAAPA*, *34*(12), 1.
9. Fleming, S., Gordes, K. L., Cawley, J. F., Kulo, V., Hagar, E., Jun, H. J., Bunnell D.J., & Kayingo, G. (2022). Advancing Telehealth Competency in Physician Assistant Education: Stakeholder Perspectives and a Curricular Model for PA Programs. *The Journal of Physician Assistant Education*, *33*(4), 353-357.

Pre-Print Articles

1. Bunnell, D. J., Bondy, M. J., Fromtling, L. M., Ludeman, E., & Gourab, K. (2025). *Bridging AI and healthcare: A scoping review of retrieval-augmented generation—Ethics, bias, transparency, improvements, and applications* (Preprint). medRxiv. <https://doi.org/10.1101/2025.04.01.25325033>

Book Chapters

1. Bunnell, D. J. (2025). Atrial fibrillation: Review and update of the most common arrhythmia. *Physician Assistant Clinics*, 10(2), 287–296. <https://doi.org/10.1016/j.cpha.2024.11.005>

Commentaries

1. Bunnell, D. J. (2011). Why understanding, preventing, and treating hospital complications matters. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*, Spring.
2. Bunnell, D. J. (2011). AAPA House of Delegates report. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*, Summer.
3. Bunnell, D. J. (2012, February 28). What is going on here?, Stop smoking!, and APACVS notes. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
4. Bunnell, D. J. (2012, March 13). Questions I wish people would ask. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
5. Bunnell, D. J. (2012, March 26). Medication shortages. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
6. Bunnell, D. J. (2012, April 1). Are you on LinkedIn? *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
7. Bunnell, D. J. (2012, April 15). Washington Post and Time magazine review medication shortages. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
8. Bunnell, D. J. (2012, May 9). Flow. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
9. Bunnell, D. J. (2012, June 1). Associations. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
10. Bunnell, D. J. (2012, July 11). Why does being wrong feel so right? *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
11. Bunnell, D. J. (2012, August 1). Endoscopic vein harvesting story continues. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
12. Bunnell, D. J. (2012, August 10). This week in the cardiothoracic PA world. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).

13. Bunnell, D. J. (2012, August 21). Research challenges common practice of stopping ACE inhibitors before CABG. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
14. Bunnell, D. J. (2012, August 26). It is a small world after all. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
15. Bunnell, D. J. (2012, Fall). Popular links on Facebook. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*.
16. Bunnell, D. J. (2012, September 11). Advice for a successful cardiothoracic surgery rotation. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
17. Bunnell, D. J. (2012, September 23). My manifesto for meaningful work. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
18. Bunnell, D. J. (2012, October 4). Critical care exercise – Learning to read the tea leaves. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
19. Bunnell, D. J. (2012, October 25). Advice on how to advertise for PAs. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
20. Bunnell, D. J. (2012, November 15). Should we be firefighters, or should we work towards fire prevention? *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
21. Bunnell, D. J. (2012, November 27). Must-see TV for cardiac surgery PAs. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
22. Bunnell, D. J. (2012, December 9). CABG is still preferable to PCI for patients with diabetes. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
23. Bunnell, D. J. (2012, December 26). How to introduce a new PA to cardiac surgery. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
24. Bunnell, D. J. (2013, February 1). The cardiothoracic PA elevator speech. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
25. Bunnell, D. J. (2013, April 29). I thought you would never ask. *Atrial Kick Blog. Journal of the American Academy of Physician Assistants*. (No longer retrievable).
26. Bunnell, D. J. (2013, Spring). Innovative study finds that a PA home visit reduces hospital admissions after cardiac surgery. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*.
27. Bunnell, D. J. (2013, Spring). APACVS strategic planning session and Board of Directors meeting. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*.

28. Bunnell, D. J. (2013, Summer). 2013 House of Delegates report. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*.
29. Bunnell, D. J. (2013, Summer). A conversation with Phil Brandt, PA-C. Not “just a kid from Pasture, VA” but also an inquisitive scientific mind focused on technical excellence. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*.
30. Bunnell, D. J. (2013, Fall). APACVS joins PA community in speaking against AMA House of Delegates resolution. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*.
31. Bunnell, D. J. (2013, Fall). PA week enables us to tell our story. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*.
32. Bunnell, D. J. (2014, Fall). 2014 House of Delegates report. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*.
33. Bunnell, D. J. (2015, Spring). How are you staying current? *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*.
34. Bunnell, D. J. (2016, Spring). PAs in cardiothoracic surgery: An update for CardioVISION. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*.
35. Bunnell, D. J. (2016, Summer). 2016 House of Delegates report. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*.
36. Bunnell, D. J. (2017, January 20). The new CardioVISION. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>
37. Bunnell, D. J. (2017, February 3). Full practice authority and responsibility for PAs. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>
38. Bunnell, D. J. (2017, February 10). PA profession is committed to team-based practice. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>
39. Bunnell, D. J. (2017, February 24). PAs regulating PAs. The need for specialty engagement. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>
40. Bunnell, D. J. (2017, March 10). PA leadership lessons learned. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>
41. Bunnell, D. J. (2017, May 26). AAPA House of Delegates passes optimal team practice resolution. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>

42. Bunnell, D. J. (2017, July 21). Atrial Kick: What do I need to know to be a cardiothoracic PA? *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>
43. Bunnell, D. J. (2017, August 4). Atrial Kick: The no apologies era of PA practice. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>
44. Bunnell, D. J. (2017, September 1). Three reasons why ... Cardiothoracic PAs need to precept students. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>
45. Bunnell, D. J. (2019, April 12). Stories from APACVS 2019. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>
46. Bunnell, D. J. (2019, May 17). Do you hear what I hear? *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>
47. Bunnell, D. J. (2019, June 7). AAPA 2019 House of Delegates update. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>
48. Bunnell, D. J. (2019, July 19). What I learned from APACVS. Chapter one. First steps. *CardioVISION: The Publication of the Association of Physician Assistants in Cardiothoracic and Vascular Surgery*. <http://multibriefs.com/briefs/APACVS>
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Poster Presentations

1. Bunnell, R. A., & Bunnell, D. J. (2002, May). *Retrospective analysis of current treatment modalities for latent tuberculosis infection at the Queens Service Processing Center of the Division of Immigration Services* [Poster presentation]. American Academy of Physician Assistants National Conference, Chicago, IL.
2. Bunnell, D., & Gordes, K. L. (2021, December). *Building a PA telehealth curriculum* [Poster presentation]. *Journal of the American Academy of Physician Assistants*, 34(12), 1. <https://doi.org/10.1097/01.jaa.0000800612.20279.91>
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International

- Bunnell, D. J. (2020, February 8). *Greetings to Indian Association of PAs in Cardiac Surgery* [Recorded video presentation]. 66th Annual Conference of Indian Association of Cardiovascular and Thoracic Surgeons, Ahmedabad, India.
- Bunnell, D. J. (2020, May 20). *PAs in Cardiothoracic Surgery* [Virtual presentation]. Royal College of Surgeons in Ireland – MSc Physician Associate Studies, Dublin, Ireland.

National

1. Bunnell, D. J. (2012, June 27). *Analgesia and sedation in critical care* [Conference presentation]. Association of Physician Assistants in Cardiothoracic and Vascular Surgery Critical Care Conference, Long Island, NY.
2. Bunnell, D. J. (2016, April). *Everything you ever wanted to know about pacemakers and ICDs but were afraid to ask* [Conference presentation]. Association of Physician Assistants in Cardiothoracic and Vascular Surgery National Conference.
3. Bunnell, D. J. (2017, June 24). Facilitated panel discussion on surgical patient safety [Panel discussion]. American Association of Thoracic Surgery Patient Safety Meeting, Boston, MA.
4. Bunnell, D. J. (2018, June 29). *Burnout* [Conference presentation]. American Association of Thoracic Surgery Patient Safety Meeting, Boston, MA.
5. Bunnell, D. J. (2019, April 7). *Understanding and overcoming burnout* [Conference presentation]. Association of Physician Assistants in Cardiothoracic and Vascular Surgery National Conference, Miami, FL.
6. Bunnell, D. J. (2019, May 18). *Association of PAs in Cardiothoracic Surgery Leadership Track* [Conference presentation]. Constituent Organization Award Lecture, American Academy of Physician Assistants National Conference, Denver, CO.
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10. Bunnell, D. J. (2021, March 25). *Culture of well-being: Medicine is a team sport* [Panel discussion]. American College of Cardiology Heart House Conversation with Experts sponsored by the Clinician Well-Being Task Force, Virtual Meeting.
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12. Bunnell, D. J. (2023, September 23). *The patient experience: Perspectives on today's healthcare* [Keynote lecture]. Maryland Academy of Physician Assistants Annual Conference, Ocean City, MD.
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OTHER SCHOLARLY ACTIVITY

- 2016 - 2017, Local Research Coordinator; Outcomes Registry for Better Informed Treatment of Atrial Fibrillation II (ORBIT AF II), Washington DC VA Medical Center
- 2018 - 2020, Local Research Staff; Efficacy and Safety of Implantable Cardioverter-Defibrillator (ICD) Implantation in the Elderly Washington DC VA Medical Center (I-70); Cooperative Studies Program #592, Washington DC VA Medical Center

Abstract

Title of Dissertation: Entrustable Professional Activities for Graduate Physician

Associates: A Modified Delphi Study

David J. Bunnell, Doctor of Philosophy, 2025

Directed by: Karen L. Gordes, Professor, University of Maryland School of Graduate Studies

The purpose of this modified mixed methods Delphi study was to achieve expert consensus on Entrustable Professional Activities (EPAs) for newly graduated physician associates (PAs). While existing PA competencies are recognized, EPAs provide a structured way to translate these competencies into assessable, practice-ready tasks. This study addresses a gap in PA education by defining EPAs that reflect the expectations of PA educators and clinicians. The study began with a literature review to identify initial EPAs, which were evaluated using the EQual rubric to ensure quality and relevance. EPAs that scored an average of 3.5/5 or higher were included. A three-round pilot Delphi survey refined the methodology, leading to adjustments in survey design and the inclusion of additional EPAs. The Delphi study engaged 35 expert PA educators and clinicians in three iterative survey rounds, with response rates of 100%, 86%, and 74% for Rounds 1, 2, and 3. Of 21 initial EPAs, 12 reached the 75% consensus Strongly Agree threshold for inclusion. Seven additional EPAs demonstrated high combined agreement (Agree and Strongly Agree). One EPA was removed due to perceived redundancy, while another failed to meet consensus. The findings have implications for PA education, competency-based medical education, accreditation, and workforce readiness. The validated EPAs offer a framework for curriculum design, assessment, and early-career

entrustment decisions. The study highlights how entrustment decisions are shaped by competency attainment, clinical expectations, and professional norms. While some EPAs reached consensus quickly, others required refinement, reflecting the complexities involved in defining workplace-ready competencies. Future research should explore EPA alignment with Competency Based Medical Education (CBME) frameworks, implementation across diverse clinical settings, predictive capabilities, comparative health professions education (HPE) studies, and institutional implications. Investigating how EPAs influence accreditation, licensure, and workforce integration will further refine their role in PA education. By integrating EPAs into curriculum design, PA programs can better align educational outcomes with workforce expectations.

Entrustable Professional Activities for Graduate Physician Associates:
A Modified Delphi Study

by David J. Bunnell

Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, Baltimore in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
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Committee Chair

Dr. Karen Gordes, PhD, PT, DScPT

Committee

Dr. Bruce DeForge, PhD, MA

Dr. Roderick Hooker, PhD, MBA, PA

Dr. Violet Kulo, EdD, PhD

Dr. Mary Lynn McPherson, PharmD, PhD, BCPS, FAAHPM

Dr. Cody Sasek, PhD, PA-C

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List of Abbreviations

AAPA	American Academy of Physician Associates
ARC-PA	Accreditation Review Commission on Education for the Physician Assistant
AACOM	American Association of Colleges of Osteopathic Medicine
AAMC	Association of American Medical Colleges
CBME	Competency-based medical education
CCC	Clinical Competency Committee
CoP	Communities of Practice
EPA	Entrustable Professional Activity
EQual	Queen's EPA Quality Rubric\
GME	Graduate Medical Education
HPE	Health Professions Education
LPP	Legitimate Peripheral Participation
NCCPA	National Commission on Certification of Physician Assistants
PA	Physician Associate
PA-C	Physician Assistant-Certified
PAEA	PA Education Association
PANCE	Physician Assistant National Certifying Exam
SLT	Situated Learning Theory
UME	Undergraduate Medical Education
URM	Underrepresented Minority

CHAPTER ONE: INTRODUCTION

Background

In health professions education (HPE) of the 21st century, there has been a notable paradigm shift away from the process-oriented, time-based educational approach established by the groundbreaking work that defined 20th-century medical education presented in *Medical Education in the United States and Canada*, commonly known as the Flexner Report (Flexner, 1910). This traditional methodology for medical education is giving way to a burgeoning focus on criterion-referenced assessment frameworks that prioritize measurable educational outcomes (Billings & Halstead, 2023; Carraccio et al., 2002; Holmboe et al., 2010). In a 2003 HPE summit, a diverse national panel of 150 health professions educators and students, regulators, accreditors, healthcare organization representatives, patients, and policy leaders recommended that all healthcare professionals be required to demonstrate competency for clinical practice through the evaluation of patient care, technical skills, and patient outcomes (Billings & Halstead, 2023; Cleland et al., 2021). In addition, as the dynamics of healthcare delivery have evolved, there has been discussion of the need to develop novel assessment tools to also evaluate student competency in the clinical practice areas of teamwork, systems thinking, and quality improvement (Holmboe et al., 2010). This shifting approach in HPE towards a competency-based education model is recognized as a step forward in preparing learners for the real-world context of clinical practice as well as a pathway toward improved healthcare quality and patient outcomes (Accreditation Review Commission on Education for the Physician Assistant, 2024; American Academy of Physician Associates, 2024).

Competency-Based Medical Education

Competency-based medical education (CBME) is “an outcomes-based approach to the designing, implementing, assessing, and evaluating HPE programs, using an organizing framework of competencies” (Frank et al., 2010a, p. 641). CBME works to achieve learning standards for medical practice (ten Cate & Taylor, 2021). The concept of CBME emphasizes achieving competency, which contrasts with the traditional time-based paradigm in which learners achieve outcomes in a defined period to be considered successful (Frank et al., 2010a).

CBME is a promising approach that addresses many of the long-standing challenges faced by traditional HPE such as “inefficiency, inflexibility, and lack of learner-centeredness” (Mehta et al., 2013, p. 1418). It is a system of learning that integrates many different learning objectives, each of which is a specific, measurable behavior that can be demonstrated (Carraccio et al., 2002). CBME focuses on learning outcomes, rather than the structure and process of learning and seeks to incorporate evidence-based educational theory and approaches in various educational settings (Carraccio et al., 2016). The primary focus of CBME in health professions education is to define clear learning outcomes for healthcare professionals, while also considering a learner's individual development (Leung, 2002; Ross et al., 2018). This learning process requires an increased focus on feedback and observation based on explicitly communicated outcomes (Leung, 2002; Ross et al., 2018). Those advocating for CBME in HPE believe this framework will enhance a program’s ability to find students at risk of failure to provide student-centered support (Ross et al., 2018). The hope is that CBME

will enable a more flexible and adaptable curriculum that can be responsive to the changing needs of patients and the healthcare system (Carraccio et al., 2016).

Reflecting constructivist learning theory, the CBME framework structures curriculum to progressively build upon existing knowledge (Frank et al., 2010b). This approach has been found to support resident physicians in taking a more active role in their learning, creating personalized learning paths to achieve competency (Railer et al., 2020). By emphasizing the connection between theoretical and practical applications, the CBME model aims to cultivate adaptable, competent professionals who are aligned with the principles of constructivism and prioritize active, reflective engagement with content.

Entrustable Professional Activities

Ten Cate introduced Entrustable Professional Activities (EPAs) in 2005 as an assessment method within the CBME framework. EPA assessments are specific, observable components of professional practice used to assess a student's competency (ten Cate, 2005). An EPA is “a unit of professional practice that can be fully entrusted to a trainee, once [they have] demonstrated the necessary competence to execute this activity unsupervised” (ten Cate & Taylor, 2021, p.1106). EPAs represent the essential tasks that define the scope of a profession and are not tied to any individual (ten Cate, 2018). They describe the actual work that needs to be done within clinical settings and can serve as the basis for clinical responsibilities (ten Cate, 2018).

Once an EPA is defined, it can be used as a framework to assess a student's progress over time (ten Cate, 2005). Faculty can observe students as they perform EPAs and provide feedback on their performance (Peters et al., 2017). This feedback facilitates personal reflection that helps learners to better contextualize their performance (Peters et

al., 2017). Entrustment decisions about learner performance have enabled clinical students to perform at a higher level of autonomy within the clinical context in which they are being assessed (Peters et al., 2017). Essential questions for developing EPAs within a curriculum include the following: defining the work that needs to be done, defining what must be demonstrated so that the student can be trusted to perform the work, how to prepare students to perform the work, and assessment methods to confirm the work can be achieved at a specified level of autonomy (ten Cate et al., 2016).

These assessments are typically formative, supporting student reflection and growth. In undergraduate medical education, however, EPAs are rarely used for high-stakes decisions like promotion or graduation. A multi-institutional American Association of Medical Colleges (AAMC) pilot found most schools used EPAs formatively, citing challenges in collecting sufficient, reliable data for summative use (Encandela et al., 2023). This highlights the distinction between low-stakes assessments for development and the aspirational use of EPAs for high-stakes decisions.

To support consistent and comprehensive implementation, ten Cate and Taylor (2021) proposed a standardized format for describing EPAs. Building on this guidance, programs should incorporate several key elements when developing EPAs. These elements include the EPA title, a clear description of its specifications and limitations, the potential risks associated with inadequate performance, and the most relevant competency domains. They also encompass the knowledge, skills, attitudes, and experiences required for entrustment. Additionally, EPA descriptions should identify sources of assessment data, expected supervision levels at various training stages, and how long the EPA remains valid if not practiced. Collectively, these components offer a

structured, practical approach for aligning EPAs with both clinical relevance and assessment rigor.

To understand the value of EPAs in assessment, it is important to consider their relationship to competencies. Competencies function as foundational learning outcomes that define the knowledge, skills, and attitudes expected of learners (Frank et al., 2010b; Vitello et al., 2021). Competency frameworks serve multiple functions, such as outlining aspects of professional practice and guiding the design of education and assessment systems (Batt et al., 2021). In contrast, EPAs represent real-world, observable tasks that integrate multiple competencies and provide a practical means of assessing learner performance in clinical settings (ten Cate, 2005). As such, EPAs serve as the bridge between theoretical competency frameworks and day-to-day professional practice. Table 1 illustrates how each EPA draws upon several competencies, reinforcing the idea that clinical activities require the simultaneous application of diverse skill sets rather than isolated abilities.

Table 1

Relationship Between Competencies and EPAs

	Competency 1	Competency 2	Competency 3	Competency 4
EPA 1	x	x	x	x
EPA 2		x	x	
EPA 3	x		x	
EPA 4		x		x

Ten Cate (2018), who originally introduced the concept of EPAs in 2005, effectively contextualized the relationship between competencies and EPAs within a CBME framework. As he explained, “Competencies describe persons. Learners who become competent professionals must acquire competencies that include knowledge,

skills, and attitudes. Professionals can possess competencies; they can never possess EPAs.”

CBME in Physician Associate Education

Physician Associate (PA) education encompasses a rigorous and comprehensive training program that prepares individuals to “practice patient-centered, team-based medicine with physicians and other healthcare professionals” (American Academy of Physician Associates, 2024, p. 57). According to the American Academy of Physician Associates (AAPA) policy manual, “PAs provide medical and surgical services as a member of a healthcare team, based on their education, training, and experience,” and “PAs exercise independent medical decision-making within their scope of practice” (AAPA, 2024, p. 57). Typically requiring a bachelor’s degree and healthcare experience for entry, PA programs range in duration from 24 to 40 months, with an average of 26.7 months, culminating in a master’s degree (PA Education Association, 2023). The curriculum is divided into a didactic phase, including classroom and laboratory instruction in medical sciences such as anatomy, pharmacology, and clinical medicine, and a clinical phase, wherein students rotate across various medical and surgical specialties. Upon completion, graduates must pass the Physician Assistant National Certifying Exam (PANCE) to obtain the Physician Assistant-Certified (PA-C) designation (National Commission on Certification of Physician Assistants, n.d.-b). Additionally, maintaining this certification demands ongoing continuing medical education and periodic recertification (NCCPA, n.d.-b).

In 2016, the PA Education Association (PAEA), which represents PA educational programs in the United States, held a stakeholder summit discussing competency

expectations for newly graduated PAs which was followed by a call to action article by Hills and colleagues (2020) in which the authors advocated for the PA profession to consider CBME as a future educational paradigm for the PA profession (Hills et al., 2020; PAEA, 2016). The authors suggested that integrating outcomes-based education into PA education and accreditation frameworks could improve the flexibility and effectiveness of PA curricula (Hills et al., 2020). This recommendation aligns with current Accreditation Review Commission on Education for the Physician Assistant (ARC-PA) standards (B1.01, B1.03, B4.01, B4.03) which require programs to define, assess, and document student achievement of measurable learning outcomes and program-defined competencies (Accreditation Review Commission on Education for the Physician Assistant, 2024). Since the 2020 call to action was published by Hills and colleagues (2020), the only scholarship within the PA profession in the United States exploring these themes consists of a commission that suggested EPAs based on a previous competency framework, research on how PA student motivation is affected while being assessed with EPAs, and work on the use of simulation to achieve competency outcomes (Lohenry et al., 2017; Sasek, 2023; Toussaint, 2021). Despite the considerable momentum of research on CBME in HPE since the beginning of the 21st century, there is little published scholarship on this topic within the PA education literature.

Theoretical Framework

This research explores EPAs based on a theoretical framework centered on the social nature of learning and professional development for PAs through the lens of social constructivism, situated learning, and communities of practice. Social constructivism

emphasizes the role of social interaction and community in shaping knowledge (Vygotsky & Cole, 1978). Creating EPA assessments, considered from a social constructivist lens, enables learners to reflect on their performance based on their individual experiences. Situated learning highlights the importance of authentic activities and participation within a community (Lave & Wenger, 1991). EPAs evaluate a learner situated in the context of the physical location and cultural context that social learning requires. Communities of practice, formed by individuals with shared interests, foster collective learning through problem-solving, knowledge sharing, and a sense of belonging (Wenger, 2010). This proposed research engages senior members of a community of practice to determine the most appropriate EPAs for entry-level members. Framing this research as described recognizes the crucial role of social interaction, authentic experiences, and collective learning in professional development, and underscores the importance of contextualized assessment and community engagement in shaping the future of PA practice.

Statement of the Problem

The PA profession has established competencies for new graduates, outlining the necessary knowledge, skills, and attitudes for PAs across the United States (American Academy of Physician Associates, 2024; PA Education Association, 2018). These competencies serve as a foundational guide for PA education and practice, ensuring graduates meet expectations for safe and effective care. However, the profession lacks EPA assessments aligned with these competencies, highlighting a research gap in developing EPAs that match existing professional standards. Addressing this gap requires

examining how current accreditation and certification standards guide the evaluation of PA student performance.

ARC-PA is the agency that defines standards for PA educational programs. The ARC-PA Fifth Edition standard B4.01 states the PA “program must conduct frequent, objective and documented evaluations of student performance in meeting the program’s learning outcomes and instructional objectives for both didactic and supervised clinical practice experience components” (Accreditation Review Commission on Education for the Physician Assistant, 2024, p. 18). The standard further mandates the “evaluations must a) align with what is expected and taught and b) allow the program to identify and address any student deficiencies promptly” (Accreditation Review Commission on Education for the Physician Assistant, 2024, p. 18). The National Commission on Certification of Physician Assistants (NCCPA), which serves as the certifying body for PAs in the United States, assesses medical knowledge through the PANCE. This multiple-choice exam is a licensure requirement in all states and may only be taken after a student has successfully graduated from an ARC-PA-accredited PA program (National Commission on Certification of Physician Assistants, n.d.-b). While the NCCPA provides a standardized measure of cognitive knowledge, PA programs are responsible for evaluating how students apply that knowledge in clinical settings (Accreditation Review Commission on Education for the Physician Assistant, 2024, National Commission on Certification of Physician Assistants, n.d.-a).

The absence of standardized EPAs leads programs to develop assessment criteria unique to their institution to comply with the ARC-PA's evaluation requirements, potentially leading to varying competency outcomes among newly graduated students

which could affect patient care and healthcare system effectiveness. This situation underscores the importance of developing validated EPAs within competency-based frameworks, informed by HPE scholarship, to produce uniformly prepared graduates ready for the healthcare system's demands. The increasing number of PA programs in the U.S. emphasizes the need for standardized EPAs to ensure newly graduated PAs are well-prepared for clinical practice and have clear performance expectations upon entering the profession (Cawley et al., 2016).

Additionally, the lack of EPAs for new PAs limits future research on their validation and reliability within CBME frameworks. This research addresses the knowledge gap by providing perspectives from senior members of the PA community which provides future opportunities to further evaluate other validity aspects of this framework. Prioritizing research on EPA validity and reliability is crucial to addressing educational system shortfalls in preparing competent clinicians and ensuring equitable training, addressing faculty biases, and mitigating disparities in healthcare delivery (Lucey et al., 2018; ten Cate et al., 2021).

Purpose of the Study

This modified mixed methods Delphi study sought consensus among expert PA stakeholders to develop EPAs for the PA educational community for entry-level PA graduates based on the current Competencies for the PA Profession. The entry-level competencies were generated by a task force comprised of representatives from four national PA organizations, including the American Academy of Physician Associates (AAPA), the Accreditation Review Commission on the Education for the Physician Assistant (ARC-PA), the National Commission on Certification of Physician Assistants

(NCCPA), and the PA Education Association (PAEA). The findings were approved by the AAPA House of Delegates in 2021 (American Academy of Physician Associates, 2024). The intent of this study is to address an existing gap in the PA education literature by generating EPAs for newly graduated PAs, aligned with the current competencies for the PA profession.

The Delphi technique employs iterative survey rounds among an expert panel to refine and provide consensus on statements provided for their consideration. The reasons for choosing this methodology to gather expert opinions are the following: 1) starting with evidence-based EPA statements ensures that the research outcomes are grounded in previous HPE literature, 2) the Delphi technique is iterative which results in both consensus and statement refinement, and 3) the technique enables participants to be informed by other experts' opinions while at the same time allows them to make private decisions that are not affected by dominate voices (Humphrey-Murto et al., 2017). The modified Delphi technique incorporates influences from HPE literature and the current PA education and practice landscape through the expert participants' perspectives.

Research Question

What EPAs should entry-level PAs be able to perform at graduation?

Significance of the Study

There is an absence of defined EPAs for entry-level PA graduates that are aligned with the established professional practice competencies for the PA profession for newly graduated PAs. The empirical significance of this research lies in offering expert opinions to validate EPAs for evaluating the competencies of newly graduated PAs. These EPAs are based on competencies outlined and promulgated through the four nationally

recognized PA organizations (AAPA, ARC-PA, NCCPA, and PAEA). The endpoint is to have the process ratified by the AAPA House of Delegates. The House of Delegates consists of PAs from state associations, specialty organizations, and special interest groups (American Academy of Physician Associates, 2024). While this study aimed to create EPAs tied to the Competencies for the PA Profession, PA programs are not obligated to utilize these competencies in their curricula (American Academy of Physician Associates, 2024). The practical value of this research is for those programs that utilize the Competencies for the PA Profession (American Academy of Physician Associates, 2024). This research provides updated assessment tools validated by PA expert consensus with experience in both education and practice. For new PA programs and those undergoing curriculum revision, this research provides EPAs integrated with the Competencies for the PA Profession to provide the foundation for their curriculum.

This study extends theoretical applications in health professions education HPE by operationalizing social constructivism, situated learning theory, and communities of practice within the context of EPAs for the PA profession. It advances theoretical understanding by illustrating how these frameworks inform the design, assessment, and implementation of EPAs, thereby addressing a gap in existing literature. In addition, the study lays a foundation for future research on the validity, reliability, and motivational impact of EPAs. This theoretical approach deepens our understanding of how professional learning occurs in clinical education settings and supports ongoing efforts to strengthen competency-based education and assessment in healthcare.

It provides a theoretical lens for understanding how these frameworks influence the development, assessment, and implementation of EPAs, addressing a gap in how

theory has been used to inform competency-based medical education. Furthermore, the study lays a foundation for future research into the validity, reliability, and motivational impact of EPAs. By integrating theory with practice, this work contributes to a deeper understanding of professional learning in clinical education and supports the ongoing evolution of educational practices in healthcare.

This study contributes to the body of theory in HPE by applying social constructivism, situated learning theory, and communities of practice to the development and use of EPAs in the PA profession.

This study enriches the theoretical landscape of HPE by applying social constructivism, situated learning theory, and community of practice learning theory to EPAs within the PA profession. It advances theoretical insights by demonstrating how these frameworks shape the design, assessment, and implementation of EPAs, addressing a gap in the literature. Moreover, by laying the groundwork for further research into the validation, reliability, and motivational aspects of EPAs, the study offers a robust theoretical foundation for exploring competency-based education and assessment in healthcare. This approach not only enhances our understanding of professional learning and development but also contributes to the evolving discourse on effective educational practices in health professions.

Definition of Key Terms

1. *Accreditation Review Commission on the Education of the Physician Assistant (ARC-PA)*: The accreditation agency that defines standards for PA education and educational programs (Accreditation Review Commission on Education for the Physician Assistant, 2024)

2. *Entrustable Professional Activity (EPA)*: “a unit of professional practice that can be fully entrusted to a trainee, once [they have] demonstrated the necessary competence to execute this activity unsupervised” (ten Cate & Taylor, 2021).
3. *Competency-Based Medical Education (CBME)*: “an outcomes-based approach to the design, implementation, assessment, and evaluation of medical education programs, using an organizing framework of competencies” (Frank et al., 2010a).
4. *National Commission on the Certification of Physician Assistants (NCCPA)*: The certifying agency for PAs in the United States (National Commission on Certification of Physician Assistants, n.d.).
5. *PA Education Association (PAEA)*: The organization representing PA educational programs in the United States (PA Education Association, n.d.).
6. *Physician Associate (PA)*: PAs are healthcare professionals licensed or, in the case of those employed by the Federal Government, credentialed to practice medicine. PAs provide medical and surgical services as a member of a healthcare team, based on their education, training, and experience. PAs exercise independent medical decision making within their scope of practice (American Academy of Physician Associates, 2024, p. 57). PAs practice patient-centered, team-based medicine with physicians and other healthcare professionals (American Academy of Physician Associates, 2024, p. 57).

Summary

CBME has gained momentum as a transformative strategy in HPE, pivoting from process-oriented to outcomes-oriented education methodologies (Carraccio et al., 2002). This shift in approach is not just a theoretical academic change, but a direct response to

the pressing societal demand for highly skilled healthcare practitioners (Carraccio et al., 2016). The effectiveness of CBME is rooted in its adaptability and responsiveness to the evolving demands of patients and the healthcare system (Carraccio et al., 2016). In the PA profession, adopting CBME can enhance curriculum flexibility and effectiveness, directly impacting patient care outcomes (Hills et al., 2020). The PA profession, being integral to the healthcare system, has a pressing responsibility to adapt to these educational advancements to meet the growing and diversifying needs of patient populations (PA Education Association, 2016).

Originally conceptualized in the 1960s, CBME has evolved to emphasize skill proficiency and measurable outcomes in medical training (McCowan, 1998). As developing tools in CBME, EPAs function as units of professional practice, entrusting trainees with critical tasks upon demonstrating competence (ten Cate, 2013). These EPAs, tailored to the clinician's context, are poised to offer more valid competency assessments (ten Cate, 2013). However, there is a critical gap in the PA profession which is the absence of EPAs aligned with the current PA professional competencies. This study, which developed consensus-based EPAs for PA graduates through a modified Delphi method involving expert PA stakeholders, responds directly to this urgent need. This research directly addresses gaps in the current educational framework by standardizing EPAs in PA education. This aligns with the education needs identified by national PA professional organizations and aims to enhance the validity and reliability of competency-based assessments in PA education, thereby directly impacting societal health (PA Education Association, 2016).

CHAPTER TWO: LITERATURE REVIEW

Introduction

This study sought consensus among expert PA stakeholders to develop PA education EPAs for entry-level PA graduates based on the current Competencies for the PA Profession (see Table 2) (American Academy of Physician Associates, 2024, p. 233). This research is situated within the evolving HPE CBME landscape, representing a shift from traditional, time-based educational frameworks toward outcome-oriented learning strategies (Carraccio & Englander, 2013; Schumacher et al., 2023; van Melle et al., 2019). EPAs have emerged as an important element in this framework, offering a practical and focused approach to assessing the readiness of HPE graduates for professional practice (ten Cate & Taylor, 2021). The imperative for such a study is underscored by the challenges and critiques associated with implementing CBME in medical education, particularly in adapting to the rapid pace of medical knowledge expansion and increasing healthcare delivery complexity (Densen, 2011; Hodges, 2010). Moreover, the integration of EPAs within PA education is aligned with the growing recognition of the need for competency-based HPE assessments, ensuring that new graduates are adequately prepared for the realities of clinical practice (Carraccio et al., 2021; ten Cate et al., 2016). The primary aim of this study was to leverage the expertise within the PA community to identify EPAs for clinical practice, ensuring they are relevant and effective for assessing the established competencies of entry-level PA graduates.

Table 2

Competencies for the PA Profession

1. Knowledge for Practice	Demonstrate knowledge about established and evolving biomedical and clinical sciences and the application of this knowledge to patient care.
2. Interpersonal & Communication Skills	Demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.
3. Person-Centered Care	Provide person-centered care that includes patient- and setting-specific assessment, evaluation, and management and healthcare that is evidence-based, supports patient safety, and advances health equity.
4. Interprofessional Collaboration	Demonstrate the ability to engage with a variety of other healthcare professionals in a manner that optimizes safe, effective, patient- and population-centered care.
5. Professionalism & Ethics	Demonstrate a commitment to practicing medicine in ethically and legally appropriate ways and emphasizing professional maturity and accountability for delivering safe and quality care to patients and populations.
6. Practice-Based Learning and Quality Improvement	Demonstrate the ability to learn and implement quality improvement practices by engaging in critical analysis of one's own practice experience, the medical literature, and other information resources for the purposes of self-evaluation, lifelong learning, and practice improvement.
7. Society & Population Health	Recognize and understand the influences of the ecosystem of person, family, population, environment, and policy on the health of patients and integrate knowledge of these determinants of health into patient care decisions.

Note. Table developed from *Competencies for the PA Profession*. American Academy of Physician Associates 2024-2025 Policy Manual. American Academy of Physician Associates. p. 233.

Background and Literature Review

Traditional Medical Education

CBME can be best understood by contrasting it with the traditional medical education system, which focuses on learning structure and process, rather than outcomes (Carraccio et al., 2002). The traditional science-based, time-dependent model has been described as “tea steeping” in which a learner spends the required time in training that was assumed to be associated with competence (Hodges, 2010, p. S34). This was consistent with a university education model in which competence was believed to involve accumulating facts to demonstrate knowledge through written exams (Hodges, 2010).

Traditional medical education’s internal and external challenges have resulted in a call to reimagine the training process (Emanuel, 2020). The emphasis on basic science and biological determinants of disease within medical education does not always correspond to the primary factors behind illness, many of which stem from human behavior (Densen, 2011). Therefore, the current educational model may not adequately prepare future healthcare professionals to address the predominant health challenges, many of which are rooted in behavioral aspects rather than just biological mechanisms. The traditional model of medical students attending lectures is on the decline with 34% of medical students reporting having attended lectures always or most of the time, while 63.5% report watching video lectures always or most of the time (American Association of Medical Colleges, 2021). Reduced attendance in traditional lectures may reflect critical feedback from the medical student community, emphasizing the need for a more engaging and relevant educational approach that aligns more closely with competency

achievement. The value of a four-year undergraduate medical curriculum has been questioned, and three-year models have been tested (Raymond et al., 2015). The Liaison Committee on Medical Education mandates that medical doctor degree granting programs include at least 130 weeks of instruction but allows flexibility in how this time is structured, with three-year programs referring to those that compress or integrate the curriculum with graduate medical education to meet this requirement within a shorter timeframe (Raymond et al., 2015). The testing of three-year undergraduate medical curricula, Raymond et al. (2015) suggested, emerged in response to increasing medical student debt and a projected physician shortage, challenging the traditional value of a four-year model by proposing a more expedited pathway to medical practice.

Additionally, most medical education takes place in hospitals, while most medical care is delivered in outpatient settings (Densen, 2011; Emanuel, 2020). The disconnect between training and practice settings contradicts the principles of social learning theory, which rely on learning taking place within the context where it will be applied (Brown et al., 1989). Limited experiential learning opportunities can also lead to competition among students, with senior learners sometimes displacing more junior or less assertive ones (Densen, 2011). Considering these observations, it becomes imperative to embrace innovative educational strategies that bridge the gap between current practice and evolving healthcare needs while fostering an inclusive and dynamic learning environment that benefits learners at all levels.

Externally, the rapid growth of medical knowledge is a challenge for traditional medical education. The doubling rate of medical knowledge is estimated to be as quick as 73 days, which means the curriculum is constantly outdated (Densen, 2011). It has been

recognized that HPE needs to adapt from a model of fact memorization to that of healthcare information processing and application (Cutrer et al., 2021).

A commission formed in a collaboration between the Lancet and Harvard University brought health education and policy experts together to address global health challenges (Frenk et al., 2010). The commission advocated for an overhaul in HPE, emphasizing curricula modernization, technology integration, and a shift towards interdependent learning, aiming to effectively respond to evolving global health needs (Frenk et al., 2010). Societal challenges such as poverty, violence, and substance abuse impact patients' health, and these challenges are not always adequately addressed in traditional medical education (Densen, 2011). Finally, the rapid growth of technology in the medical field is challenging the traditional model, as it requires new skills and knowledge that are not always taught in medical education (Densen, 2011). Hence, there is a need for HPE to adapt and innovate, ensuring it remains relevant and responsive to the ever-changing landscape of medical knowledge, societal challenges, and technological advancements.

In their narrative review and commentary, Ryan, and colleagues (2022) identified limitations to the traditional graduate medical education model during the COVID-19 pandemic. For instance, the pandemic highlighted how in evaluating clinical readiness, there are certain competencies more difficult to assess in the clinical environment and those that may require more development (Ryan et al., 2022). Examples provided were professionalism, interprofessional teamwork, quality improvement, patient safety, care coordination, and cost consciousness (Ryan et al., 2022). An additional problem area identified was the handling of learner transition from undergraduate medical education

(UME), to graduate medical education (GME), to practice (Ryan et al., 2022). The difficulty presented by the pandemic highlighted that the lack of readiness for learner transitions between the stages of medical education is common and efforts, such as intensive onboarding experiences sometimes called “boot camps,” to alleviate this have been described as unsuccessful (Ryan et al., 2022).

Zetkalic and colleagues (2024) provide insights into the challenges associated with transitions between undergraduate medical education (UME) and graduate medical education (GME) within traditional medical education. Their qualitative study included semi-structured interviews with UME and GME leaders, as well as published scholars in the field, conducted until thematic saturation was achieved (Zetkalic et al., 2024).

The study identified several key themes: mistrust, misaligned goals, inadequate communication, and inflexible time frames. Participants noted that UME’s responsibility to place graduates into GME settings sometimes undermines the perceived trustworthiness of UME assessments. This misalignment makes it difficult for GME educators to identify the most qualified residency candidates (Zetkalic et al., 2024).

Communication between UME and GME stakeholders was also viewed as inadequate. Participants described wide variation in the evidence used to demonstrate learner competence. As a result, GME admissions committees are left to interpret unstandardized UME assessments, making it difficult to accurately assess incoming learners' readiness (Zetkalic et al., 2024). Additionally, the rigid, time-based nature of medical education was seen as a structural barrier. Participants suggested that addressing this issue would require systemic change to support greater flexibility (Zetkalic et al., 2024).

The authors acknowledge limitations, including a small sample size and the fact that participants were supportive of competency-based medical education (CBME), which may not reflect experiences in less CBME-receptive institutions. Moreover, the study's focus on internal medicine, particularly in GME, may limit generalizability. However, because internal medicine's GME structure is similar to that of other specialties, some findings may be transferable (Zetkovic et al., 2024). Overall, the study highlights the need for systemic reforms to improve alignment and trust between UME and GME, enhance communication about learner competence, and introduce greater flexibility in medical education timelines.

Competency-Based Medical Education

CBME is an educational reform model that represents a shift from traditional medical training models to emphasizing a learner-centric paradigm that prioritizes developing key competencies for effective and safe patient care (van Melle et al., 2019). In their scoping literature review, Frank and colleagues (2010a) aimed to establish a clear, consensus-based definition of CBME from the HPE literature. The authors performed a qualitative analysis of themes and subthemes of the selected articles from their scoping review to develop a representative definition for CBME grounded in the HPE scholarship (Frank et al., 2010a). Their analysis, with the earliest references starting in 1973, focused on 173 key documents, identifying four core themes associated with CBME. The four identified core themes were 1) an organizing framework, 2) a clearly stated rationale, 3) a contrast of CBME with time-based educational models, and 4) strategies for implementing CBME (Frank et al., 2010a). Furthermore, six subthemes were identified: 1) education defined by outcomes, 2) a competency-based curriculum, 3)

tangible and observable outcomes, 4) programmatic assessment, 5) a learner-focused curriculum, and 6) an emphasis on meeting societal healthcare needs (Frank et al., 2010b). Based on their qualitative analysis, Frank et al. (2010a, p. 636) provided the following definition for CBME, which they initially termed CBE,

Competency-based education (CBE) is an approach to preparing physicians for practice that is fundamentally oriented to graduate outcome abilities and organized around competencies derived from an analysis of societal and patient needs. It deemphasizes time-based training and promises greater accountability, flexibility, and learner-centeredness.

In a 2019 Delphi study, a team of 60 international HPE scholars working together in a professional group called the International CBME Collaborators developed consensus for five central aspects of CBME, reporting that CBME includes: 1) defining specific outcome competencies, 2) ensuring a sequenced progression in learning, 3) providing tailored learning experiences, 4) focusing instruction on these competencies, and 5) implementing programmatic assessment (van Melle et al., 2019). The authors remark that a CBME approach is rooted in constructivist learning theories, which highlights the importance of learners actively engaging in the construction of their knowledge through experience and reflection (van Melle et al., 2019). Additionally, they comment that CBME is an educational reform model that accommodates various learning paces, centering the curriculum around student outcomes and promoting active student engagement in the learning process (van Melle et al., 2019). This article by van Melle et al. (2019) highlights the emphasis of current HPE literature on outcomes-based education development.

CBME curriculum aims to achieve defined outcomes that align assessments with competencies (Carraccio & Englander, 2013). This outcomes-based focus changes the educational goal from a faculty focus on how instructors teach to a learner focus on what students learn (Driscoll & Wood, 2007; Spady, 1994). In the CBME model, assessments measure students' progress toward achieving competencies and enable actionable feedback (Carraccio & Englander, 2013). This feedback can help students identify areas where they need to improve and can help faculty to identify struggling learners early in the curriculum, which can lead to interventions that help them succeed (Hamza et al., 2023). The CBME model's focus on competency is an important feature of lifelong learning that is useful beyond a learner's primary medical education (Carraccio & Englander, 2013).

CBME Challenges

While the CBME framework presents a range of benefits, implementing this educational model faces multiple challenges. One CBME requirement is the expectation that students actively manage their learning process, demanding a high degree of engagement and self-direction (Carraccio & Englander, 2013). This aspect can be particularly challenging as it shifts responsibility to the learners, who must navigate their educational path, often with less structured guidance compared to traditional educational models.

A crucial component of CBME involves regular formative feedback, which is essential for students to understand their progress and areas of performance that need improvement. However, some learners may experience anxiety or discomfort in seeking feedback (Hamza et al., 2023). This hesitancy can stem from various factors, such as fear

of criticism, uncertainty about how to process and implement feedback effectively, or a lack of confidence in their abilities (Hamza et al., 2023). Such barriers can impede student acquisition of vital insights necessary for improving performance and advancing learning.

It can be challenging to implement CBME in a way that is both effective and efficient (Hamza et al., 2023). CBME implementation requires careful policy considerations at the programmatic and institutional levels, as education administrators transform their programs to a learner-centered model (Gruppen et al., 2017). Key implementation considerations include coordination, funding, human resources, reliable resources, the need for increased faculty involvement and development, balancing competence with competencies, and consideration of implications for clinical practice and licensure (Taber et al., 2010).

The current HPE infrastructure may not be adequate to support CBME, particularly in providing sufficient clinical education opportunities for learners (Hamza et al., 2023). Kayingo and colleagues (2023) describe an acute shortage of clinical education sites exacerbated by the growth of HPE programs with similar learner needs. Furthermore, PA programs have been placed on probation by the ARC-PA having difficulty demonstrating compliance with accreditation standards related to clinical education (Kayingo et al., 2023). Learners who have limited clinical practice exposure may not have the opportunity to develop the competencies that are required for safe and effective patient care (Hamza et al., 2023). Clinical educators play a vital role in CBME but often receive low or no compensation or developmental training for their work (Hamza et al., 2023).

Frequent assessment and effective feedback are essential CBME features, and successful implementation depends on faculty willingness to participate in workplace-based assessments (Carraccio & Englander, 2013). A challenge arises when faculty members lack training to effectively utilize CBME assessment tools, potentially resulting in inconsistent and inaccurate evaluation (Green & Holmboe, 2010). There is also a need to understand better how these assessment tools are implemented in real-world settings (Carraccio & Englander, 2013). One multi-institutional qualitative study of Canadian surgical residents found that an unintended consequence of CBME assessment, described as consistent, was the increased administrative workload for the clinical student - described as the learner assessment burden (Ott et al., 2023). One method of demonstrating a learner's progress toward achieving the competencies required for safe and effective patient care is through a CBME portfolio. However, as of 2024, there is no standard way to develop portfolios or summative assessments, making it difficult for educators to compare learner competence across different educational programs (Hamza et al., 2023).

CBME can sometimes focus on ensuring that learners meet a minimum competency level, rather than on helping learners achieve skills and knowledge mastery (Hamza et al., 2023). CBME critics argue that by dissecting and simplifying medical practice concepts into component parts, the art of medicine may be lost and, consequently, the capacity to deliver personalized patient care may be diminished (Ahn et al., 2023; Hamza et al., 2023). The judgment and reflection required to practice medicine are important, but they can be difficult to assess objectively (Hamza et al., 2023).

Clinical Competency Committees

An element identified to foster the success of a CBME program is the Clinical Competency Committee (CCC). The primary role of a CCC in CBME programs is to review and analyze learner data for making informed entrustment decisions, which is a pivotal aspect of CBME (Gruppen et al., 2018). The learner portfolios that CCCs evaluate can comprise a wide array of components. These can include EPA assessments, clinical performance evaluations, reflective self-assessments, feedback from supervisors and peers, and Objective Structured Clinical Examination (OSCE) scores (Goldhamer et al., 2022; Shah et al., 2016). Also, examination results, research, and scholarly work, learning and improvement plans, procedure and patient logs, and attendance and participation records can be included (Goldhamer et al., 2022; Shah et al., 2016). This comprehensive collection of data provides a holistic view of a student's progress toward competency and areas for development.

Determining whether a learner is ready to take on more responsibilities is a complex and challenging process undertaken by CCCs (Pack et al., 2020). Pack and colleagues (2020) conducted a single-center constructivist grounded theory study in which they observed and interviewed members of seven post-graduate HPE programs that included program directors, competency committee chairs, and faculty members who served on competency committees. In addition to making summative decisions about individual learners, they frequently found that competency committee discussions led to identifying weaknesses in their overall HPE program that the CCC needed to overcome (Pack et al., 2020).

Difficulties inherent to EPA assessment data were mentioned by the study participants (Pack et al., 2020). For instance, having only a small number of EPA assessments for an individual learner and the rarity of representative disease states were cited as difficulties in summative decision-making by CCC members (Pack et al., 2020). While simulation can be part of the solution to meet the EPA assessment demands, CCC members sometimes found that access to representative patients was limited secondary to where and when patients sought care which occasionally meant learner access to patients could only be achieved in the distant future (Pack et al., 2020). While this study is limited to the context of one Canadian center it does provide qualitative information that can inform other institutions electing to utilize a CCC.

CCCs scrutinize and interpret extensive data to form summative judgments (Carney et al., 2023; Pack et al., 2020). This assessment review volume was cited as a barrier to success in Pack and colleagues' (2020) work in which participants both endorsed the vital need to complete pre-meeting work to support robust discussions but also acknowledged that this can sometimes mean reviewing hundreds of documents. To address this reality, Carney and colleagues (2023) highlighted the need for an increased focus on learning analytics that utilizes technology to overcome this barrier to CBME implementation. This requires data integration to incorporate insights from the following sources: electronic medical record clinical data, educational institutional programmatic evaluation data, and learner management systems that gather clinical educator assessments (Carney et al., 2023). While it may be tempting for higher education administrators to believe that this problem can be solved by investing in technology, Carney and colleagues (2023) also recommend that these processes and systems be

managed by data teams that include doctoral and master's degree prepared HPE scientists. The scholarship presented by Pack et al. (2020) and Carney et al. (2023) indicates that achieving the CBME objectives outlined by van Melle et al. (2019), such as achieving competency outcomes, enabling sequenced learner progression, facilitating personalized learning experiences, providing competency-based instruction, and conducting programmatic evaluation, necessitates substantial investment in human capital and technology.

Understanding the viewpoints of both learners and clinical educators regarding the Clinical Competency Committee (CCC) process is crucial, as they are the primary stakeholders responsible for generating EPA assessment data used in CCC deliberations. Smit and colleagues (2023) conducted a qualitative study using semi-structured focus groups within the first EPA-based medical residency program in the Netherlands. Medical residents and clinical educators were interviewed separately to capture distinct perspectives (Smit et al., 2023).

The study revealed that both groups recognized two key assessment phases: a pre- and post-entrustment period. These phases framed stakeholder perspectives across three central themes: 1) individualized training, 2) the supervisor's role, and 3) the overall CBME process (Smit et al., 2023). Both residents and faculty acknowledged that CBME supported personalized learning pathways, emphasizing the importance of learners taking responsibility for their own development.

Despite this shared emphasis on individualized learning, tensions emerged between residents and supervisors regarding educational ownership. While residents highlighted the importance of early support from their supervisors, supervisors expressed

concern that learners were reluctant to take initiative. In fact, supervisors perceived that residents often attributed delays in progress to lack of supervisory engagement (Smit et al., 2023). These divergent views also surfaced in how each group understood the EPA assessment process used by the CCC. Supervisors believed that residents should take the lead in seeking formative assessments. While residents appreciated this expectation, they found the process to be time-consuming and burdensome (Smit et al., 2023).

The authors identified two notable limitations. First, the study focused exclusively on pediatric residents and supervisors within a single healthcare system, which may limit transferability of these findings to other specialties or settings. Second, the absence of interim data analysis limited the opportunity to adjust the inquiry as new themes emerged, potentially narrowing the study's insight (Smit et al., 2023). Taken together, these findings underscore the complexity of implementing EPA-based assessment processes in CBME. Notably, the difficulties described by Smit et al. (2023) echo the work of Ott and colleagues (2023), who also identified assessment burden as a challenge to successful CBME implementation.

The scholarship identifying CBME implementation problems has also inspired efforts to gain deeper understanding of these issues. Szulewski et al. (2023) conducted a qualitative study encompassing sixty interviews and eighteen focus groups across eight residency programs in a single institution. This study aimed to gain a deeper understanding of two key areas: 1) the assessment burdens faced within these programs, and 2) the adaptations at the program level implemented to mitigate these burdens. The authors identified three main assessment burden themes: 1) disparate mental models of the CBME assessment processes, 2) challenges in workplace-based assessment processes,

and 3) challenges in performance review and decision-making (Szulewski et al., 2023).

Adaptations to these challenges included revising entrustment scales, implementing faculty development sessions, creating alternative assessment strategies, enhancing proactive assessment planning, adding resident representatives to competence committees, and improving assessment technology platforms (Szulewski et al., 2023). These strategies, developed in response to the significant CBME assessment burden, were designed to improve the effectiveness and efficiency of medical education processes. Notably, this study did not explore the outcomes resulting from the strategies identified, indicating a need for further research to evaluate the effectiveness of these approaches.

Evolving Assessment Concepts

The evolution of HPE assessments in clinical education has undergone a shift in focus from a positivist to a constructivist paradigm. Initially grounded in a positivist paradigm, assessments were designed under the assumption that it was possible to objectively measure student qualities by focusing on exam construct validity and reliability (Schuwirth & van der Vleuten, 2020). This belief in objectivity reflected the idea that assessments can provide clear and measurable outputs without interference from assessor subjectivity. However, poor student assessment sampling strategy is a larger factor in unreliability than subjective assessor influences (Swanson & Norcini, 1989).

There is a deepening appreciation for the multifaceted nature of competence (Schuwirth & van der Vleuten, 2020). Recognizing students as key stakeholders in the assessment process is a critical aspect of this evolution (Schuwirth & van der Vleuten, 2020). Shifting from a behaviorist framework, which emphasizes reinforcement and

punishment, to a constructivist approach signifies a fundamental change in how educational outcomes are viewed (Harrison et al., 2016). The constructivist perspective emphasizes learners' active roles in making sense of and deriving meaning from their educational experiences. This learner-centered approach aligns with the introduction of EPAs (ten Cate, 2005). EPAs are workplace-based assessments designed to directly observe performance in real-world settings, providing a more authentic competence appraisal. The current understanding of assessment embraces the inherent subjectivity in evaluating complex concepts such as competency (Schuwirth & van der Vleuten, 2020). This perspective accepts that variability among assessors can provide a richer, more diverse view of learner competence. This suggests that differences in assessment are not discrepancies but rather complementary viewpoints that enrich our understanding of what it means to be competent (Schuwirth & van der Vleuten, 2020). The transition from viewing assessments as purely objective measures to recognizing them as complex, integrated systems reflects an evolution in how assessments integrate into HPE programs.

Entrustable Professional Activities

In HPE, competencies are defined as the critical skills and abilities necessary for medical professionals to provide safe and effective care (ten Cate, 2005). However, these competencies are often too abstract for objectively assessing learner performance (Virk et al., 2020). To bridge this gap, the concept of EPAs was introduced to provide improved learning assessments within CBME (ten Cate, 2005). EPAs are specific tasks or responsibilities that learners are expected to perform independently once they have acquired the requisite competencies (ten Cate, 2013). EPAs help make competencies more tangible and meaningful, enhancing their utility in assessment for both learners and

educators (van Loon et al., 2014). Being specific, observable, and measurable, EPAs are pivotal in evaluating learner advancement (ten Cate & Taylor, 2021). HPE programs use EPAs to monitor and evaluate learners' task performance, which informs their decisions regarding the appropriate level and timing of granted autonomy (Persky et al., 2021). Additionally, EPA assessments adopt a prospective approach, focusing on assessing a learner's capability for future practice, in contrast to the retrospective nature of traditional clinical evaluations (Postmes et al., 2021). Lastly, EPAs are intricately linked with learning outcomes, creating a curriculum that is aligned with the necessary competencies for learner development (Persky et al., 2021).

To be effective, EPAs must be embedded in a relevant clinical context (ten Cate, 2018). When EPAs are situated in a clinical context, they become more meaningful for learners and can be used to assess learners' ability to perform real-world tasks (van Loon et al., 2014). The critical importance of evaluating real-world clinical tasks underscores the necessity for students, as legitimate peripheral participants in communities of practice, to be immersed in the clinical environments where they will eventually serve as full participants (McKenzie et al., 2020). This situational context is essential for learner development and future practice.

EPA Assessment Implementation

In their 2021 study, Carraccio and colleagues employed the Delphi research method, engaging a panel of expert medical educators and doctoral researchers proficient in establishing EPAs within medical education. The aim was to consolidate expert opinions on crucial implementation aspects, drawing participants from the United States, Canada, and the Netherlands (Carraccio et al., 2021). This diverse panel facilitated a

comprehensive and multifaceted exploration of best practices and challenges in integrating EPAs into medical curricula across different educational and healthcare systems. The study focused on the intricacies of entrustment decision-making, a pivotal process in determining a trainee's readiness for unsupervised patient care. This multifaceted process incorporates the trainee's performance, the tangible effects of their care on patients, and the faculty's evaluation of their preparedness (Carraccio et al., 2021). A key consensus point was the need for a unified agreement among faculty members regarding the performance standards expected for each EPA at the time of entrustment. Carraccio et al. (2021) advocate for intuitive assessment scales that blend seamlessly with the clinical learning environment and emphasize the significance of incorporating qualitative narratives into performance assessments, as a means of augmenting quantitative metrics. Overall, the authors conclude that the impact of a trainee's care on patients is a primary indicator of their readiness for unsupervised practice of specific EPAs.

Logic Supporting EPA Frameworks

Hennus and colleagues (2022) completed a scoping literature review of 42 peer-reviewed articles and identified three distinct EPA logic frameworks through iterative inductive coding analysis: service provision, clinical procedures, and disease or patient groups. Each of the identified logic frameworks had a set of advantages and disadvantages. The service provision framework includes broad task categories in which healthcare providers directly or indirectly affect patient care (Hennus et al., 2022). For instance, conducting a physical examination in various settings falls under this category (Hennus et al., 2022). This framework emphasizes an integrated approach to patient care,

highlighting the diverse roles of a healthcare provider. However, it can lack specificity in assessing individual competencies, which is crucial for targeted educational interventions.

The clinical procedures logic framework is centered on the execution of clinical skills during patient care (Hennus et al., 2022). While this approach is critical for ensuring procedural proficiency, it does not fully capture the more nuanced aspects of patient care, such as communication and patient-provider relationships (Hennus et al., 2022). There is also a risk of over-emphasizing technical skills at the expense of other important competencies like clinical reasoning.

EPAs within the disease or patient group logic category are aligned with the management of specific diseases or patient demographics (Hennus et al., 2022). It is instrumental in preparing clinicians for the specific disease processes they will face in clinical practice. However, this approach might lead to a compartmentalized understanding of patient care, potentially neglecting the importance of a more holistic, patient-centered approach. Hennus and colleagues (2022) highlight that individual EPA implementation examples frequently employed more than one logic model. A combined approach allows for a comprehensive understanding and assessment of a clinician's competencies. However, integrating multiple frameworks can pose challenges, such as ensuring consistency in assessment and maintaining clarity in educational objectives. Balancing the strengths and addressing the limitations of each framework is crucial for effective implementation in HPE.

EPA Implementation Challenges

Despite the potential advantages of integrating EPA assessments into HPE programs, various challenges in implementing EPA assessments have been noted in the literature. Ahn and colleagues (2023) performed constructivist grounded theory research with residency programs using EPAs in a single Canadian center. The researchers performed semi-structured interviews with 18 medical and surgical residents from 13 different programs who ranged from post-graduate years two to five (Ahn et al., 2023). Like the earlier conversation regarding CCCs, as detailed in the study by Smit and colleagues (2023), the participants' opinions were split between those who recognized the value of the process and those who viewed the administrative demands of using EPAs as conflicting with the learning experience (Ahn et al., 2023). The authors concluded that for effective implementation of EPAs three fundamental elements must function together: 1) the program must effectively convey the importance of EPA assessments to learners, 2) faculty attitudes and behaviors should endorse the process, and 3) learners must feel supported by both the program and faculty, enhancing their motivation for self-learning and view of EPAs as beneficial assessment tools (Ahn et al., 2023). The authors highlighted that this qualitative study aimed to capture the unique experiences of participants from one academic medical center, and therefore, transferability to other contexts was not the primary objective (Ahn et al., 2023). However, the authors assert that the findings were consistent with other published literature (Ahn et al., 2023).

This study highlights the importance of viewing the identified challenges of EPAs as guidelines for future improvements. This research emphasizes that programs need to clarify EPA assessments are not just about accumulating assessment data but rather are

intended to focus on the learning opportunities they present. The research underlines the importance of communicating the value of regular, formative assessments to learners. If learners sense faculty disinterest or minimal involvement, particularly in providing timely and meaningful qualitative feedback, it can hinder the successful adoption of EPAs. Conversely, when learners feel supported by both the program and faculty, and understand the administrative effort involved, they are more likely to appreciate the value of feedback from EPA assessments in their personal growth and development (Ahn et al., 2023).

EPA Research in PA Education

Scholarly exploration of EPAs has been limited to an examination of EPAs by a PAEA Presidents Commission, one study exploring the motivational factors of PA students and EPAs, and two studies evaluating the impact of EPAs incorporated into PA educational programs within the Netherlands (de Raad et al., 2023; Loheny et al., 2017; Sasek, 2023; Wiersma et al., 2017)). Notwithstanding this scholarship, there remains a paucity of scholarly work focused on EPAs in PA education. This underscores the necessity for additional investigation to enhance our understanding of this assessment framework.

The PAEA Presidents Commission, a committee of nine members, was the first PA professional body in the United States to describe EPAs and the first to offer EPAs aligned with the PA professional competencies available at the time (Loheny et al., 2017). The Commission consisted of five former PAEA Presidents with academic appointments in PA education as well as NCCPA certifications and four individuals who

were PAEA staff members capable of providing expertise in administration, assessment, academics, and communication (Lohenry et al., 2017).

The commission noted that it used the following guidelines to choose, reformulate, or compose new PA-specific EPAs: the total number of EPAs should be fewer than 20, each EPA should consist of succinct wording, all EPAs must be observable and measurable, and all EPAs should exemplify what the public expects from a new PA graduate (Lohenry et al., 2017). The PAEA Presidents Commission took a stepwise approach to explore the possibility of defining EPAs for PAs. First, the group reviewed EPAs from primary care physician residencies (pediatrics, internal medicine, and family medicine) and the AAMC EPAs for those entering residency (Lohenry et al., 2017). These EPAs, along with those developed by the University of Utah PA Program, were assessed for PA practice appropriateness as defined by the 2013 Competencies for the PA Profession (Lohenry et al., 2017).

In their examination, the commission assessed EPAs from the previously mentioned medical residency, medical student, and Utah PA student examples, and then proceeded to exclude any overlapping concepts identified between these sources (Lohenry et al., 2017). The commission reported that EPAs were prioritized for those describing PA graduate expectations but did not clarify their underlying definition of this concept (Lohenry et al., 2017). While it was stated that they reviewed the 2013 Competencies for the PA Profession to synthesize competencies with EPAs, it was not presented how the competencies and the resulting EPAs were connected (Lohenry et al., 2017). Lastly, the commission ranked the EPAs they believed were most appropriate for new PA graduates (Lohenry et al., 2017).

This cross-referencing between PA practice EPAs created at the University of Utah PA Program and existing EPAs within UME and GME resulted in the commissioned group generating a list of 13 proposed EPAs for PA graduates along with two additional stretch EPAs (see Table 3) (Lohenry et al., 2017). Stretch EPAs were described as aspirational activities that were thought to be beyond the core activities expected of a newly graduated PA (Lohenry et al., 2017). Additionally, the authors provided a comprehensive implementation roadmap for implementing the proposed EPAs and described implications for the profession if EPAs were to be used as an assessment tool (Lohenry et al., 2017).

Table 3

PAEA Presidents Commission Proposed EPAs for PA Graduates

Entrustable Professional Activity
<ol style="list-style-type: none">1. Incorporate principles of cultural competence across the health care continuum.2. Gather essential and accurate information about patients through history-taking, physical examination, and the use of laboratory data, imaging, and other methods.3. Locate, critically evaluate, integrate, and appropriately apply scientific evidence to patient care.4. Develop and implement patient management plans.5. Provide preventive health care services and education.6. Provide transfer of care in a variety of settings.7. Develop and manage interpersonal interactions.8. Work and communicate effectively as a leader or member of an interprofessional health care team to provide patient-centered care.9. Identify and correct gaps in knowledge, skills, or attitudes.10. Use information technology to manage information and optimize patient care.11. Apply public health principles to improve care for patients, populations, communities, and systems.12. Identify system failures and contribute to a culture of safety and improvement.13. Recognize and develop strategies to address system biases that contribute to health care disparities.
Stretch EPA
<ol style="list-style-type: none">14. Facilitate the learning of students and other health care professionals.15. Contribute to the fiscally sound and ethical management of a practice.

Note. Table developed from Lohenry, K.C., Brenneman, A., Goldgar, C., Hills, K.J., Vander Meulen, S.P., Lane, S., Ziegler, O, Barwick, T.A., & Fletcher, S. (2017). Entrustable professional activities: A new direction for PA education? *The Journal of the PA Education Association. Volume 28, pp 33-40.*

There are limitations to the methods the commission employed in developing EPAs for the new PA graduate. While their arguments for the methods and results were mostly consistent with the literature at the time, a notable methodological incongruence was utilizing a committee to outline the EPAs rather than an anonymous Delphi method process. Social pressure may have been introduced through this methodology which may have discouraged some from offering opinions counter to the dominant committee narrative. Also, three authors were working with their supervisor, the PAEA Chief

Executive Officer at the time. There may have been bias based on workplace dynamics. The authors did not offer any perceived limitations of this study within the manuscript. Notably, Loheny and colleagues (2017) published their work eight months before the EQual Rubric was published, a rubric designed to evaluate EPAs for alignment with their purpose (Taylor et al., 2017). The commission may have enhanced the validity of their work by incorporating the EQual Rubric in establishing PA EPAs. However, the commission's recommendation for a follow-up Delphi method study to refine their work reflects their insight into potential bias in their methodology.

There is little research exploring the impact of EPAs on PA learners. However, Sasek (2023) conducted a qualitative study to explore the impact of EPAs on student motivation. This case study research included four PA students engaged in a telemedicine simulation. Students were recruited through purposive sampling to achieve heterogeneity in sex and academic performance within the sample (Sasek, 2023). Study participants' perceptions were obtained through reflection journals and semi-structured interviews (Sasek, 2023). Data were coded, themes were identified, and trustworthiness was demonstrated through triangulation, member checking, thick description, and reflexivity. The study found that EPAs provided a holistic and credible assessment in a complex clinical learning environment, feedback was seen as meaningful, the construct of trust added an affective dimension that increased the impact of the evaluation, and the concept of trust also increased the connection between the learner and the clinical educator (Sasek, 2023). The researcher noted that while others have suggested that introducing the concept of trust could negatively affect learner self-esteem, this was not true in this study (Sasek, 2023).

The author acknowledged study limitations such as his dual role as educator and researcher, the use of simulation rather than workplace-based assessment, and the absence of struggling students in the simulated clinical activity (Sasek, 2023). These limitations suggest that future research that overcomes them is warranted. This research's significance in the HPE EPA literature is enhanced by its focus on the learner as a central participant in the process.

From an international perspective, Wiersma et al. (2017) examined whether utilizing EPAs within a PA curriculum enabled a flexible, individualized, and competency-based program. This single-center study considered the experiences of the PA program at the University of Applied Sciences in Utrecht, Netherlands which was one of the earliest HPE programs to adopt EPA assessments (Wiersma et al., 2017). While US-based PA programs teach a general medical and surgical curriculum with individuals specializing after graduation, Dutch PA students receive individualized EPAs created by the program in the curriculum based on the specialty they were hired into before matriculation. All students have two years of relevant healthcare work experience before matriculation (Wiersma et al., 2017).

The study considered data from all students enrolled in the 30-month Master of Physician Assistant degree program (Wiersma et al., 2017). The researchers used a retrospective document review that included individual student EPAs, medical specialties for which the students were training, and the number of EPAs entrusted at graduation (Wiersma et al., 2017). The researchers analyzed data from 119 students enrolled in four PA student cohorts with initial enrollment between 2010 and 2013 with all participants graduating by 2016 (Wiersma et al., 2017).

Of the initial 119 students, data from 101 students were analyzed because 16 students had been dismissed from the academic program and two were affected by what was described as a delay in the study period (Wiersma et al., 2017). The PA students were trained in 28 medical and surgical specialties (Wiersma et al., 2017). The study found that the mean number of EPAs initially developed by the program to prepare individual PAs for the specialty for which they were hired before matriculation was 6.8, with a range of between four and twelve (Wiersma et al., 2017). However, the mean number of EPAs mastered was 6.6 with a range between three and thirteen (Wiersma et al., 2017). Over 50% of students experienced a change in their initial EPAs at some point in the study period (Wiersma et al., 2017).

The authors concluded that the study highlighted the flexibility of EPAs in meeting the needs of a particular medical setting (Wiersma et al., 2017). A common reason for changing an EPA was when students requested additional assessments be added to their list (Wiersma et al., 2017). An additional reason for a change was when it became apparent that an EPA needed to be clarified (Wiersma et al., 2017). The authors concluded that EPA assessments contribute to a flexible, individualized, and competency-based process (Wiersma et al., 2017). However, something missing from this study was the description of how EPAs were developed. Developing EPAs for individuals that can change over time is a notable difference between the Dutch experience and this research which developed EPAs for all newly graduated PAs.

The similarity in PA roles in the two countries suggests that implementing EPAs in a CBME framework can succeed in the US. Additionally, the feasibility of EPA implementation in the US would be easier because it would not require the complexity of

managing differing learning outcomes. An interesting concept highlighted by Wiersma et al. (2017) was the Dutch students' desire to expand their demonstrated abilities beyond their initial list of EPAs. This learner engagement in the assessment process suggests a dynamic learning environment that may support student motivation.

De Raad et al. (2023) expanded on research by Wiersma and colleagues (2017) by studying PA perceptions related to the potential for continued professional development after graduation. This work highlighted that, like PAs practicing in the US, PAs after graduation continue to gain new skills and abilities as well as have the flexibility to change specialties (de Raad et al., 2023). This similarity provides an interesting insight into the potential of creating additional postgraduate EPAs.

The qualitative study by de Raad et al. (2023) consisted of an analysis of a survey distributed to 1,441 Dutch PAs with the assistance of five PA programs and the Dutch Association of PAs. The survey was pilot-tested and further developed at the University of Applied Sciences before its release (de Raad et al., 2023). The survey distribution included alumni from the three PA programs that do not utilize EPAs for assessment (de Raad et al., 2023). The survey had different questions for PAs trained with and without EPAs to better understand the perceived role of EPAs from those familiar with the concept to more broad questions about professional development for individuals who were not trained with an EPA model (de Raad et al., 2023). In addition to the survey questions, participants could provide further qualitative comments for which data were coded and themes identified (de Raad et al., 2023).

There were 421 PAs (29%) who responded to the survey of which 120 had been trained with EPA assessments (de Raad et al., 2023). Of the 69% of respondents who

answered a question inquiring about whether post-graduate competence should be documented, 90% indicated that this action should occur (de Raad et al., 2023). The participants believed that EPAs would be helpful to clarify their roles to patients, colleagues, and the healthcare system (de Raad et al., 2023). They also felt EPAs would be helpful to justify their scope of practice for legal and insurance purposes (de Raad et al., 2023). Additionally, the Dutch PAs expressed a desire to document their competency and demonstrate new competencies in a setting where collaborative relationships can change (de Raad et al., 2023).

There were only five PAs (1%) who indicated that they believe EPAs should not have a role in their practice for the following reasons: the workload to demonstrate competency was undesirable, there was doubt that post-graduate competency would ever be questioned, and there were other ways to demonstrate competency that was unspecified by the participants (de Raad et al., 2023). PAs who were not trained with EPA assessment were excluded from the EPA-specific questions (de Raad et al., 2023). The authors acknowledged the limitation of a 29% response rate and the inherent limitations of survey-based research (de Raad et al., 2023). This study demonstrates that PAs who experienced assessments utilizing EPAs in their primary education also see the benefit of developing additional EPAs after graduation as a pathway to competency. This willingness by practicing PAs to consider further EPA assessment suggests that they perceive value in these assessments.

EPA Research within Physician Undergraduate Medical Education

In 2014 the AAMC released a curriculum guide for 13 EPAs for physicians entering residency (Association of American Ass Medical Colleges, 2014). These EPAs

were drafted by a panel of medical education experts who performed a literature review organized via thematic analysis for potential EPAs, completed a Delphi study, and then completed member checking through a panel of medical educators, students, residents, and other healthcare professionals (Englander et al., 2016). The resulting 13 Core EPAs for Entering Residency are outlined in Table 4.

Table 4

Core Entrustable Professional Activities for Entering Residency

-
1. Gather a history and perform a physical examination
 2. Prioritize a differential diagnosis following a clinical encounter
 3. Recommend and interpret common diagnostic and screening tests
 4. Enter and discuss orders/prescriptions
 5. Document a clinical encounter in the patient record
 6. Provide an oral presentation of a clinical encounter
 7. Form clinical questions and retrieve evidence to advance patient care
 8. Give or receive a patient handover to transition care responsibility
 9. Collaborate as a member of an interprofessional team
 10. Recognize a patient requiring urgent or emergent care and initiate evaluation and management
 11. Obtain informed consent for tests and/or procedures
 12. Perform general procedures of a physician
 13. Identify system failures and contribute to a culture of safety and improvement
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Note. Table developed from Englander, R., Flynn, T., Call, S., Carraccio, C., Cleary, L., Fulton, T. B., ... & Aschenbrener, C. A. (2016). Toward defining the foundation of the MD degree: Core entrustable professional activities for entering residency. *Academic Medicine, 91*(10), 1352-1358.

The AAMC partnered with 10 medical schools to pilot the 13 core EPAs. Amiel and colleagues (2021) reviewed the pilot results conducted between 2014 and 2021. The pilot aimed to share what was learned regarding the framework and to facilitate student

transitions from UME to GME with valid assessments. Schools agreed to pilot at least four EPAs with all 13 EPAs being piloted throughout the evaluation.

The pilot EPA research was considered through the lens of constructs developed by the Joint Committee Standards for Education Evaluation (Amiel et al., 2021). These constructs included propriety, feasibility, utility, and accuracy. The construct of propriety considered the welfare of the medical students being evaluated. The pilot schools recognized that EPAs had never been tested on a large scale and therefore student well-being needed to be considered. This informed the decision to ensure that EPAs were formative and not related to summative assessment decisions to progress a student in the curriculum. The feasibility construct considered pragmatic decisions of how the assessments would be collected. Utility construct evaluations analyzed whether assessments served the needs of the stakeholders. The construct of accuracy was considered through validity and reliability perspectives. Overall, the authors felt that propriety standards were met by all schools. However, the data were mixed concerning feasibility, utility, and accuracy.

Amiel et al. (2021) summarized the EPA pilot by discussing the characteristics of each EPA that were considered in thematic clusters. The clusters included the following: core of the core (history and physical, differential diagnosis, documentation, oral reports, evidence-based medicine, and interprofessional collaboration), the limited exposure cluster characteristic of advanced learners (diagnostic tests, orders, and patient handovers), aspirational EPAs (urgent care, informed consent, and safety), and EPAs not originally in the framework that should be considered (patient education, counseling, motivational interviewing, and telemedicine) (Amiel et al., 2021). This analysis

underscores that these EPAs, despite the painstaking work to develop them, are currently in an early developmental phase, emphasizing the necessity for additional research on the implementation of the developed EPAs.

The authors found that student well-being was prioritized through the construct of propriety (Amiel et al., 2021). However, the view that EPAs should only be used for formative assessments would limit the ability to use this assessment tool for progression decisions within CCCs if this were to become operationalized in policy. The judgment of feasibility was based on the fact the mean number of student EPA assessments throughout the study had a range from less than 1 to 7.9. The number of students for whom the decision was made to entrust with an EPA ranged from 42% to 94%. A better understanding of the reasons for variability in the number of assessments performed and the number of students trusted to perform an EPA needs further exploration.

The utility construct was evaluated through a survey of residency program directors, conducted after three months of working with new first-year residents who had participated in the study as medical students (Amiel et al., 2021). This survey assessed the interns' readiness for residency based on EPAs, with perceived preparedness for residency based on EPAs ranging from 69% to 93%. Notably, the area identified as having the lowest level of competency was procedure performance. While the high end of the range for perceived readiness is encouraging (93%), the low level of preparedness based on EPAs survey results at 69% suggests that some believe 31% of interns are unprepared for residency. Given the considerable number of medical students who matriculate into GME, this finding represents a substantial number of physicians identified as unprepared for practice as an intern.

The utility construct is central to the argument for using EPAs because if an individual who was granted entrustment from one institution is not deemed to be competent at another, then the assessment tools lose their cross-program usefulness. The study found difficulty with the construct of reliability because institutions were using different instruments to assess EPAs (Amiel et al., 2021). Near the mid-point of the study, on the advice of the research team, several of the institutions incorporated the recommended entrustment scales. Further research into EPA assessments as useful tools to predict future performance is crucial for widespread use.

The American Association of Colleges of Osteopathic Medicine (AACOM) undertook an independent review of the 13 EPAs established by allopathic medical schools. It was determined that adopting these EPAs would better align the professions within a shared graduate medical education system, where they undergo residency and fellowship training together (Basehore et al., 2017). Additionally, the osteopathic medical school education community identified six additional EPAs specifically focused on osteopathic knowledge. These additional osteopathic-specific EPAs were excluded from my research because PAs are not trained in the osteopathic model or licensed to perform osteopathic manipulation (Basehore et al., 2017). The decision to align with the EPAs of allopathic medical schools underscores the commitment of the osteopathic medical education community to harmonizing professions within a shared graduate medical education system. Simultaneously, the establishment of specific EPAs for osteopathic knowledge emphasizes the necessity for differentiation. Recognizing the imperative for a common skill set in clinical practice, it becomes evident that PA education should incorporate EPAs aligned with those established by both allopathic and osteopathic

medical schools, ensuring coherence across healthcare professions. However, the osteopathic community's decision to introduce a degree of differentiation highlights the differences that must be considered in EPA development. This background underscores the necessity for PA-specific EPAs that acknowledge both the similarities and differences between these professions.

The exploration of EPAs in PA education remains a developing area of scholarly investigation, marked by studies and initiatives aimed at initial exploration. Notably, the PAEA Presidents Commission played a critical role in introducing the concept of EPAs to the PA community by undertaking the task of describing and developing EPAs based on previous PA competencies. This process, as detailed by Loheny et al. (2017), emphasized a stepwise approach to ensure the relevancy and applicability of EPAs within PA education. Additionally, the literature highlights varied impacts of EPAs on PA learners, from enhancing student motivation to improving learning outcomes, as seen in studies such as Sasek's (2023) investigation into the motivational effects of EPAs within a telemedicine simulation and Wiersma et al.'s (2017) evaluation of EPA implementation in Dutch PA curricula for fostering a more individualized, competency-based educational experience. Moreover, the broader context of EPA research within physician undergraduate medical education, including the AAMC's efforts to establish core EPAs and their pilot testing across institutions, provides a foundational backdrop against which the unique challenges and opportunities of EPA integration into PA education can be assessed (Amiel et al., 2021; Englander et al., 2016). This cross-disciplinary scrutiny underscores the need for continued research into the adaptation and impact of EPAs in

PA education and spotlights a critical avenue for advancing CBME and enhancing PA training programs.

While the existing literature on CBME and EPAs has advanced our understanding of the design, implementation, and assessment of EPAs, it falls short of providing a basis for assessing newly graduated PAs based on the current PA competencies in the United States. This limitation has led to a gap in how EPAs, validated by the expertise of PA clinicians and educators, can be implemented to promote and demonstrate deep, contextual learning by PAs. This proposed research not only addresses the development of EPAs for newly graduated PAs but also embeds these activities within a constructivist framework. This integration aims to ensure that EPAs not only assess competencies but also facilitate situated learning within communities of practice, thus preparing graduates more effectively for their complex clinical roles. By grounding the development of EPAs in robust educational theory, this research underscores the importance of theoretical foundations in enhancing PA education and clinical practice. This deliberate integration serves as a critical bridge to the following theoretical discussions, highlighting the necessity of aligning educational practices with foundational educational theories to advance the field.

Theoretical Framework

This research is grounded in a theoretical framework that integrates three key theories: social constructivism, situated learning, and communities of practice. It explored the influence of social interaction and community involvement on professional development. The frameworks involve ideas on the social nature of learning, followed by situated learning theory's emphasis on authentic activities, and how people interact

through communities of practice (Lave & Wenger, 1991; Vygotsky & Cole, 1978; Wenger, 2010). These frameworks offer valuable insights into the social nature of learning, informing the exploration of EPAs for newly graduated PAs.

Social Constructivism

The social constructivism theoretical framework in this Delphi study to establish EPAs for newly graduated PAs was critical in highlighting how essential social interactions and community engagement are in shaping professional skills and knowledge in medical practice. Central to the concept of social constructivism is the assertion that learning is fundamentally a social process (Vygotsky & Cole, 1978). Learning results from the interactivity between an individual's immersion in their environment and their pre-existing knowledge base (Vygotsky & Cole, 1978). Vygotsky introduced the transformative idea that knowledge is constructed through interactive processes within a community. His seminal work emphasizes that knowledge construction is facilitated by the individual's dynamic interplay between internal reflection and external interactions (Vygotsky & Cole, 1978).

Vygotsky's ideas illuminate the crucial role of the zone of proximal development (ZPD), where learners can achieve their fullest potential through collaboration with more knowledgeable peers or mentors (Vygotsky & Cole, 1978). This concept underscores the importance of social dynamics in the learning process, highlighting how individuals navigate and integrate new information within the bounds of their cultural and linguistic context. Furthermore, Vygotsky stressed the significance of internalizing cultural tools, such as language, positing that these tools are pivotal in shaping cognitive development

and facilitating the assimilation and modification of new knowledge (Vygotsky & Cole, 1978).

By positioning social interaction and cultural tools at the heart of cognitive development, Vygotsky's work lays a foundational framework for understanding learning as an inherently social and interactive phenomenon. This perspective asserts that knowledge is co-constructed within communities, acknowledging the intricate relationship between the individual's internal reflection, external interactions, and the surrounding social fabric. Thus, social constructivism, deeply rooted in Vygotsky's insights, portrays learning as an intricate dance between the individual's experiences, the surrounding social fabric, and the broader cultural landscape, emphasizing the collective nature of the journey toward knowledge formation.

Situated Learning Theory

Situated learning theory (SLT) enriches social constructivism by emphasizing the specific context in which learning occurs (Lave & Wenger, 1991). Unlike traditional views that focus on individual knowledge acquisition through formal instruction, SLT highlights social interaction and active participation within a community of practice as crucial elements for meaningful learning (Brown et al., 1989). This deeper understanding empowers educators and practitioners to cultivate environments where individuals not only acquire knowledge but also become fully engaged and contributing members of their communities.

Central to SLT is legitimate peripheral participation (LPP) (Lave & Wenger, 1991). Newcomers engage in LPP by initially observing and assisting more experienced members with peripheral tasks. Through guided participation and increasing

responsibility over time, they gradually acquire knowledge and skills, becoming fully participating members of the community. Lave and Wenger (1991) highlight that the concept of legitimacy cannot be paired with illegitimacy. There is no illegitimate participation. Instead, LPP is the first step towards full practice participation (Lave & Wenger, 1991). This process underscores the importance of social interaction, as knowledge is co-constructed through collaboration and participation within the community (Lave & Wenger, 1991).

SLT emphasizes the significance of authentic activities in the learning process. Learners acquire knowledge and skills not through abstract theoretical instruction but by actively engaging in community practices (Brown et al., 1989). This focus on practice underscores the interconnectedness of knowledge and action. Knowledge is continuously refined and applied in real-world situations, fostering a deeper understanding of its practical application.

SLT offers valuable insights into bridging the gap between classroom learning and real-world application. By engaging in authentic practice within a community, learners move beyond possessing knowledge to learning knowledge application (Brown et al., 1989). This approach, referred to as cognitive apprenticeship, involves learners acting as apprentices, gaining a deeper understanding through direct interaction with experienced practitioners within the community (Brown et al., 1989). Applying SLT principles can enhance collaborative problem solving, provide a clearer understanding of community roles, confront student misconceptions, and foster the development of essential skills for collaborative practice environments (Brown et al., 1989).

Community of Practice

Building upon the previously described SLT by Lave and Wenger (1991), Wenger (2010) expanded and refined learning theory related to communities of practice (CoP). These enduring and supportive networks are formed by individuals who share a common interest or objective (Barab et al., 2002). This shared enterprise fosters a dynamic environment where members actively engage in problem-solving, knowledge exchange, and collective learning (Wenger, 2010).

The three core elements of CoPs are the community, the practice, and the domain (Seibert, 2015). The community encompasses the members and their interactions, forming a collective driven by shared interests or goals. Through active engagement in shared activities and problem-solving, members create a collaborative learning environment where everyone benefits from each other's experiences and expertise (Wenger, 2010). The practice refers to the collective body of knowledge and skills that the members share and develop together. Importantly, this practice is not static; it evolves as members contribute their expertise and learn from one another (Seibert, 2015). The shared repertoire of tools, language, and practices within the community forms the foundation for communication and collaboration, fostering collective understanding (Wenger, 2010). The domain involves a common purpose and shared identity that binds the community together (Seibert, 2015). The shared professional domain provides direction for collaborative efforts and gives members a sense of belonging and motivation to contribute their knowledge and skills (Wenger, 2010). The domain defines the scope and direction of the community, ensuring that members are aligned in their pursuits and that their interactions and shared practices serve a coherent goal (Crues et al., 2018).

Together, these three elements - community, practice, and domain - create a framework that not only fosters learning and collaboration but also nurtures a sense of belonging and purpose among its members (Cruess et al., 2018). Wenger's (2010) work remains a cornerstone of CoP theory, providing a comprehensive framework for understanding how social interaction and participation in shared practices contribute to individual and collective learning.

While a community of practice is a helpful framework for understanding social learning, some noted limitations need to be considered so that researchers and educators can overcome the shortcomings identified by these critiques. The notion that communities of practice are harmonious and conflict-free has been challenged; it is important to acknowledge and overcome disputes and disagreements within these communities because these experiences lead to positive community development (Farnsworth et al., 2016). This observation contradicts the idealized perception of practice communities as cohesive and collaborative. Additionally, a tension within these communities can be the balance between the pursuit of in-depth inquiry within a narrow domain and the necessity of cross-disciplinary engagement for fostering innovation (Farnsworth et al., 2016). While specialized communities can yield profound insights in focused areas, innovation is often propelled by interdisciplinary interactions (Farnsworth et al., 2016). Lastly, the issue of access and inclusivity within communities of practice is a concern (Farnsworth et al., 2016).

Care must be taken to be mindful of barriers to entry in some communities, which can result in exclusivity and guardedness (Farnsworth et al., 2016). Factors such as gender, social class, and race are recognized as potential impediments to access,

indicating that mere competence is not always the sole criterion for inclusion (Farnsworth et al., 2016). Rather than refuting the theory, these criticisms provide awareness so that efforts can be made during this research to avoid potential pitfalls. Despite these criticisms, CoP remains an ideal theoretical framework for researching EPAs that entails knowledgeable community members assessing new members engaging in LPP in authentic medical practice.

Summary

This chapter provided a comprehensive examination of the context of CBME in which EPAs find their place. By delving into the intricacies of CBME, a deeper understanding was gained regarding how EPAs fit into the broader framework. Reviewing EPA literature in the PA profession provided an opportunity to explore and understand the context for the first set of EPAs offered by the PAEA, early research on PA student motivation, review of EPAs in PA education in the Netherlands, and a multi-institutional pilot study on EPAs in physician undergraduate medical education (de Raad et al., 2023; Loheny et al., 2017; Sasek, 2023; Wiersma et al., 2017)).

CBME emphasizes the attainment of specific competencies that define a practitioner's ability to perform tasks, make decisions, and demonstrate the necessary skills to provide high-quality patient care (van Melle et al., 2019). EPAs, as an element of CBME, can facilitate the essential feedback loop within a community of practice (ten Cate, 2005). This feedback mechanism is a crucial catalyst in transforming individuals into proficient and competent practitioners in medicine. EPAs are the tangible representations of these competencies, serving as discrete units of professional practice

that encapsulate the key abilities required of a competent medical professional (ten Cate, 2013).

A community of practice plays a pivotal role in nurturing the development of future practitioners. It acts as a supportive network where experienced professionals impart their knowledge and wisdom to the learners, guiding them toward mastery (Wenger, 2010). This collaborative environment fosters a culture of continuous learning and improvement, where the collective expertise of the community enriches the individual growth of each learner. The next chapter will explore the modified Delphi methodology as a research tool to obtain expert insights for developing suitable EPAs for entry-level PAs.

CHAPTER THREE: METHODOLOGY

Introduction

The purpose of employing a modified mixed methods Delphi method study was to survey expert PA stakeholders to develop EPAs for newly graduated PAs based on the Competencies for the PA Profession created by a cross-organizational task force (composed of representatives from the AAPA, ARC-PA, NCCPA, and PAEA) and approved by the AAPA House of Delegates in 2021. This study gathered consensus on expert opinion related to EPAs aligned to the current competency framework accepted by the PA education community for entry-level PA graduates. This chapter discusses the research design, research question, participants and sampling, study procedures, the researcher's role, data collection, data analysis, methods to ensure the study's trustworthiness, ethical considerations, methodologic limitations, and potential challenges.

Research Design

The research design for this study was the modified Delphi technique to gain consensus from PAs who are experts in education and clinical practice (Humphrey-Murto et al., 2017). This modified-Delphi study utilizes mixed methods of quantitative Likert-scale opinions and qualitative comments. The professions of medicine and PA share similarities in education and practice. The core EPAs for physicians entering GME were developed using a modified Delphi study. Therefore, the modified Delphi method was the preferred qualitative research technique to find expert consensus for determining EPAs for newly graduated PAs.

A distinction that can be made between the modified and classical Delphi techniques lies in using existing EPAs from HPE literature versus having participants create new EPAs not based on previous work (Nasa et al., 2021). By providing EPAs that were created by physician groups and a previous PA commission, this study leverages the findings of previous EPA literature to provide the participants a starting point in which to consider what EPAs are appropriate for newly graduated PAs in the contemporary American practice environment. In addition to providing expert opinions on existing EPAs, participants had an opportunity to provide ideas for EPAs not presented in the initial survey. The modified Delphi study, guided by these criteria, revealed PAs' beliefs about how EPAs developed for similar professions apply to PA practice.

No universally accepted quality criteria exist for assessing Delphi methods in healthcare research, which presents a challenge for researchers seeking to ensure methodological rigor and transparency (Nasa et al., 2021). To address this inherent methodological limitation, this study incorporated established guidance from two widely cited sources. The procedural recommendations outlined by Humphrey-Murto et al. (2017) were followed to ensure a systematic and iterative approach to data collection and consensus-building. Additionally, the quality criteria proposed by Diamond et al. (2014) were used to evaluate the design and execution of the Delphi rounds. Together, these frameworks provided a structured foundation to enhance the credibility and consistency of the research process.

The modified Delphi method is a qualitative research technique that uses a series of questionnaires to obtain expert consensus on a particular topic. Humphrey-Murto and colleagues (2017) outlined the following procedural steps for a Delphi study: identifying

the research problem, conducting a literature search to inform consensus statements related to the topic, developing the statement questionnaire, distributing the questionnaire to an expert panel, summarizing panel feedback to revise the questionnaire, redistributing the questionnaire for a series of rounds until consensus is achieved, and compiling and summarizing the consensus results. In a Delphi study, the panel of expert participants are not known to each other, and participant feedback is anonymous, as individual responses are not shared with other participants. This ensures that participants feel free to express their true opinions without fear of being influenced by the opinions of other panelists and to prevent dominant voices from controlling the narrative (Humphrey-Murto et al., 2017; Nasa et al., 2021).

In addition to the procedures outlined above, criteria have been created to assure quality within Delphi studies: 1) using panel participant criteria that are reproducible, 2) generating an *a priori* statement regarding the number of anonymous questionnaire rounds that will be completed, 3) establishing clear criteria for dropping statement items on the questionnaire, and 4) setting clear criteria for when to stop distributing the questionnaire to the panel (Diamond et al., 2014).

Research Question

What EPAs should entry-level PAs be able to perform at graduation?

Participants and Sampling

The Delphi method utilizes a panel of experts to achieve consensus on a particular topic. When a research question is narrow in focus, it is beneficial for the panel of experts to be homogenous (Nasa et al., 2021). Further, panel experts should be chosen based on their expertise in a specific content area. Given the narrow scope of this study's research

question and the content area being within PA education, panel experts were comprised of PAs with both education and clinical practice expertise.

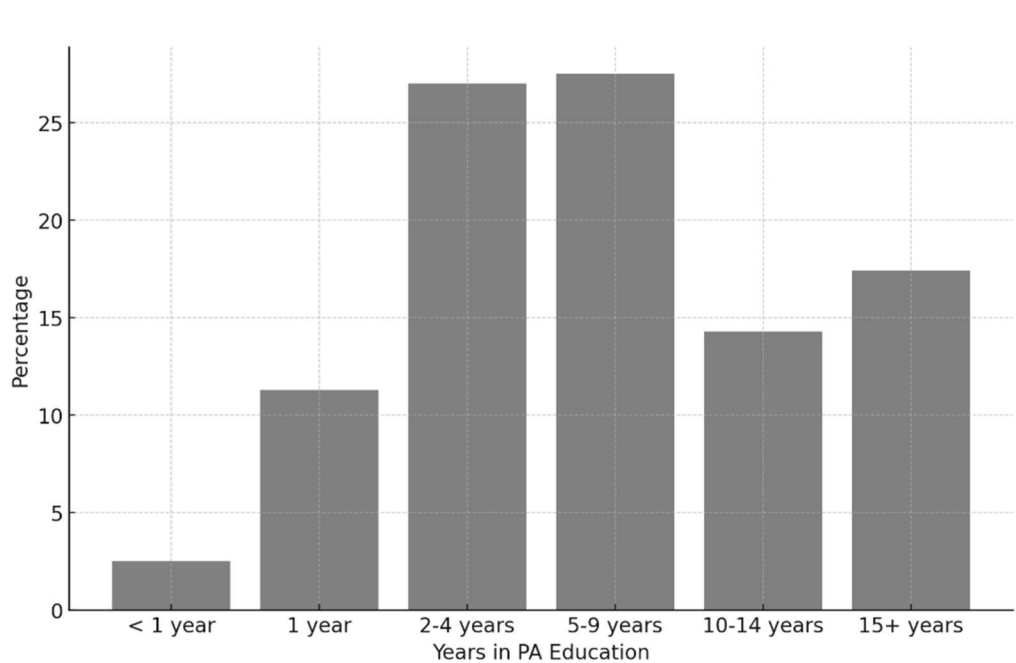
Participants were required, at minimum, to have the academic rank of Assistant Professor. This criterion suggests that research participants have undergone review by their institutional promotion committees with ongoing review to ensure they meet the standards for success as an academic. Expertise in PA education was defined as those employed for at least five years as a principal PA faculty member, or as a PA preceptor who has precepted at least 10 PA students in the past two consecutive years. The rationale for establishing the benchmark for full-time faculty experience at five years is based on a review of the PAEA Faculty and Directors 5 Survey (2024). This survey indicates that faculty with five or more years of experience represent a distribution at the higher end of the survey sample, constituting 59.2% of faculty (see Figure 1 and Table 5) (PA Education Association, 2024). This criterion ensured that faculty have taught and assessed at least two complete cohorts of PA students, gaining sufficient experience to understand the competencies expected of new PA graduates. A review of the HPE literature found no evidence linking expertise to the number of years in education. However, the five-year benchmark chosen for this study provided a practical measure for recruiting an experienced participant sample that is informed by the distribution of the current PA education workforce.

I utilized both purposive and snowball sampling strategies in this study. Purposive sampling allowed for the intentional selection of participants with specific expertise relevant to the research topic, ensuring that those included could provide informed perspectives (Creswell & Guetterman, 2019). Additionally, snowball sampling was

employed to expand the participant pool by leveraging the professional networks of initial participants, enabling the identification of other qualified individuals who met the inclusion criteria and contributed valuable insights (Creswell & Guetterman, 2019).

Figure 1

Distribution of PA Faculty Experience



Note. Graph developed from PA Education Association. (2024). By the numbers: Faculty report 5: Data from the 2022 faculty & directors survey. Washington, DC. PAEA.

Table 5

Years of PA Faculty Experience

	Percentage of Faculty
Less than 1 year	25.0%
1 year	11.3%
2 -4 years	27.0%
5 - 9 years	27.5%
10 - 14 years	14.3%
15 or more years	17.4%

Note. Table developed from PA Education Association. (2024). By the numbers: Faculty report 5: Data from the 2022 faculty & directors survey. Washington, DC. PAEA.

In the context of the current study, expertise in clinical practice was defined as having at least 10 years of clinical PA practice experience and holding current NCCPA board certification. Although there is no HPE literature correlating the number of years of practice with expertise, specifying 10 years of practice ensures that study participants have had sufficient patient care experience to judge the competence required for a new PA graduate. Additionally, requiring NCCPA certification ensures that participants have maintained their clinical knowledge through continued medical education and are assessed through standardized testing. Participant screening involved presenting study inclusion criteria and asking participants to self-certify that they met the criteria.

The size of a Delphi panel can vary, ranging from as few as 10 panel participants to as many as 1000 participants (Nasa et al., 2021). Nasa et al. (2021) suggest the determination of panel size is at the researcher's discretion, considering factors such as the panel's diversity, the nature of the problem, and the resources available. This study included a homogenous group of PA experts; therefore, a smaller sample size was

deemed adequate, as such, a panel comprised of 25 individuals was targeted (Frenk et al., 2010; Keeney et al., 2011). The initial goal of 25 participants accounted for the potential for attrition that would still enable my research to proceed at the low end of the range identified by Nasa et al. (2021) of 10.

Fifty-six individuals responded to recruitment efforts. Of the 56 respondents, 35 self-certified as meeting the study's inclusion criteria, reflecting active engagement in clinical practice and contributions to primary PA education. The remaining 21 respondents were deemed ineligible for participation based on specific criteria. Sixteen were excluded due to not currently practicing medicine, having minimal interaction with PA students as clinical preceptors, or being involved in PA fellowships or residencies rather than primary PA education, as these roles involve learners at a different stage of expertise. Five additional individuals were excluded despite initial engagement for failing to complete the self-certification verification process. These rigorous recruitment and selection processes ensured that the study population included individuals actively engaged in clinical practice and primary PA education, with experiences and perspectives that were crucial for addressing the study's objectives.

Procedures

Institutional Review Board Approval

This study (HP-00111191) was determined to be exempt under 45 CFR 46.104(d) from IRB review by the University of Maryland, Baltimore Institutional Review Board (See Appendix A).

Initial Entrustable Professional Activities

The modified Delphi study began with a literature review to select initial EPAs for consideration by study participants. These EPAs were then assessed for their quality and relevance to this research using the EQual rubric (Appendix B). EPAs that scored an average of 3.5 out of 5 (70%) or greater were included in the study. Following this evaluation, the EPAs were mapped to the Competencies for the PA Profession as detailed in Table 7. This mapping exercise was essential to ensure that the initial EPAs comprehensively covered all necessary PA competencies.

Literature Review of PA and Physician EPAs

To inform EPA selection for study participants, a literature review was conducted examining workplace-based assessments of PAs and physicians published in the health professions education literature. PAs and physicians were chosen as the basis for initial EPAs because the professions share several key similarities in their professional roles within healthcare. Both professions are involved in direct patient care, encompassing patient assessment, diagnosis, treatment, and health education. Their practice is characterized by a team-based approach, where collaboration with other healthcare professionals is essential (Crowley et al., 2024). Extensive education and rigorous training are foundational for these roles. They have the authority to prescribe medications and are involved in patient counseling and chronic disease management. Furthermore, they are bound by ethical and legal responsibilities to provide safe and effective care. These similarities highlight the overlapping competencies that are integral to ensuring comprehensive healthcare delivery. Employing identified EPAs from the literature review

establishes a foundation of validated EPAs for inclusion in the questionnaire for this study.

The literature review identified 15 EPAs for PAs in the context of the previous version of PA competencies (Lohenry et al., 2017). Additionally, allopathic medical schools created 13 EPAs for physicians entering residency (Englander et al., 2016). The osteopathic medical school community independently reviewed these 13 EPAs and adopted them to align the professions within a shared graduate medical education system in which they participate in residency and fellowship training together (Basehore et al., 2017). These osteopathic educators established six additional EPAs specifically aimed at osteopathic knowledge which were excluded from this research because osteopathic manipulation is not incorporated in the Competencies for the PA Profession nor is this included in ARC-PA Accreditation Standards (Basehore et al., 2017).

Considering the existing EPAs from both the PA and physician communities were not crafted with the current iteration of the Competencies for the PA Profession in mind, an evaluation of EPAs identified in the literature review was conducted. To address gaps and ensure comprehensive coverage of the current competencies, I developed five additional EPAs (see Table 6). Each of these newly created EPAs was mapped to specific PA competencies and met the required EQUAL rubric score criteria for inclusion in the study (see Table 6). These additional EPAs were assessed by the study participants, providing a critical evaluation of their relevance and applicability to current PA competencies.

Table 6

EPAs Developed to Address Gaps in PA Competencies

Evaluate ethical dilemmas in patient care
Demonstrate collaborative care coordination
Critically analyze and apply biomedical knowledge
Facilitate relationship building through communication
Improve clinical practice through reflective learning

Note. EPAs met EQual rubric criteria for study inclusion, averaging at least 3.5 / 5 (70%).

Table 7

Initial EPA Alignment with PA Competencies

EPA	Knowledge for Practice	Interpersonal & Communication Skills	Person-centered Care	Interprofessional Collaboration	Professionalism & Ethics	Practice-based Learning & QI	Society & Population Health
Prioritize a differential diagnosis following a clinical encounter	✓		✓				
Document a clinical encounter in the patient record		✓			✓		
Gather a history and perform a physical examination	✓		✓				
Provide preventive healthcare services and education			✓				✓
Recommend and interpret common diagnostic and screening tests	✓					✓	
Conduct culturally competent patient interviews and assessments		✓	✓		✓		
Provide an oral presentation of a clinical encounter		✓		✓			
Develop and implement patient management plans	✓		✓				
Enter and discuss orders and prescriptions	✓				✓		
Facilitate relationship building through communication		✓		✓	✓		
Continuously improve clinical practice through reflective learning					✓	✓	
Form clinical questions and retrieve evidence to advance patient care	✓					✓	
Give or receive a patient handover to transition care responsibility		✓	✓	✓			
Obtain informed consent for tests and/or procedures		✓			✓		
Perform general procedures of a physician	✓		✓				
Recognize patient requiring urgent or emergent care and initiate evaluation and management	✓		✓				
Evaluate ethical dilemmas in patient care					✓		
Demonstrate collaborative care coordination				✓			✓
Critically analyze and apply biomedical knowledge	✓					✓	
Provide transfer of care in a variety of settings			✓	✓			
Gather essential and accurate information about patients through history-taking, physical exam, and use of data			✓				

Ensuring EPA Quality

To ensure that the EPAs included in the questionnaire for this study met the established quality standards for EPAs, each EPA, identified from the literature and considered for inclusion, was assessed using the EQual rubric (see Appendix C). This rubric, also known as the Queen's EPA Quality Rubric, is instrumental in identifying and revising EPAs that fail to adequately align with the characteristics of EPAs as outlined in the HPE literature (Taylor et al., 2017). The EQual rubric comprises 14 items spanning three domains: defining EPAs as distinct work units, recognizing EPAs as entrusted tasks essential and significant to the profession, and identifying their role in the educational curriculum. The EQual rubric has demonstrated high reliability in scoring among HPE educators with expertise in EPAs ($\kappa = .85$) (Taylor et al., 2017). For their study, Taylor and colleagues (2017) defined experts as licensed clinicians with experience as HPE program directors and individuals who are engaged in EPA scholarship, of which, I meet all three criteria. Therefore, I am qualified to rate EPAs based on the original validation literature. In evaluating EPAs for inclusion in the questionnaire for my study, an average score of 3.5 out of 5, or 70%, was the benchmark for determining EPA study inclusion. The rationale for the 3.5 / 5 threshold (70%) was that this benchmark distinguishes EPAs that succeed or fail through the lens of the EQual rubric based on a common academic threshold for success. To exclude lower-quality EPAs from consideration, any EPA scoring an average of 3.4 or lower using the EQual rubric were not presented to the panel participants.

Following this evaluation, I reviewed the EPAs to ensure they comprehensively represented the Competencies for the PA Profession. Table 6 presents the 20 initial EPAs mapped to the seven PA competency domains. The most frequently represented domain was Person-centered Care, demonstrated in 10 EPAs, underscoring the role of individualized, context-sensitive clinical decision-making. Knowledge for Practice was evident in nine EPAs, reflecting biomedical and clinical reasoning as elements of PA training. Professionalism and Ethics and Practice-based Learning and Quality Improvement were each demonstrated in seven EPAs, emphasizing ethical conduct, reflective practice, and continuous improvement. The Interpersonal and Communication Skills competency was demonstrated in six EPAs, while Interprofessional Collaboration appeared in five, reinforcing the team-based and communicative nature of modern healthcare delivery. Finally, Society and Population Health was represented in two EPAs, indicating a limited focus on public health and social determinants in the initial EPA framework. This mapping exercise was essential to ensure that the initial EPAs comprehensively covered all necessary PA competencies.

Survey Pilot Testing

A three-round pilot Delphi survey was conducted with PA education and practice experts, utilizing the Qualtrics survey platform, an online tool for data collection and analysis (see Appendix D). The pilot test obtained feedback on the survey link functionality, question layout, ease of navigation, survey compatibility across various devices and browsers, and efficiency of feedback mechanisms. Insights gained informed critical adjustments to the primary study, including improved instructions, streamlined questionnaire design, expanded response scales, and robust engagement strategies.

The pilot study participants suggested adding new EPAs for consideration to better capture critical administrative and cultural competencies. The pilot participants proposed the following EPAs, which were added to the Delphi study: *Perform Medical Coding and Billing for Patient Encounters* and *Conduct Culturally Competent Patient Interviews and Assessments*. Pilot study details about participants and findings can be found in Appendix E.

Recruitment

I utilized purposive sampling by directly recruiting individuals who met the participant inclusion criteria. The study recruitment letter was posted on the PAEA Professional Learning Community Forum, the AAPA Huddle Forum, PA member only Facebook groups (such as the PA Educators Facebook Group), the social media platform of LinkedIn, and via email distribution lists of influential PA leaders (see Appendix F). Snowball sampling was employed by asking participants to forward the study recruitment letter to others they believe meet the inclusion criteria.

To ensure inclusive recruitment, direct outreach targeted a range of diverse PA leaders and groups. This included contacting all PA programs at Historically Black Colleges and Universities (HBCUs) and engaging with professional bodies such as the AAPA Diversity, Equity, and Inclusion (DEI) Committee, the AAPA Health Equity and DEI Steering Committee, and various identity-focused PA Special Interest Groups (SIGs). These SIGs represented a broad spectrum of communities, including the African Heritage Caucus, the Fellowship of Christian PAs, the Jewish Association of PAs, the LGBT PA Caucus, PAs in Asian Health, PAs in Latino Health, the Muslim Association of PAs, and the Veterans Caucus.

Participant Education

Educating research participants about the research methods and the concept of EPAs was essential to this study. The modified Delphi methodology can be cognitively demanding, so it was important to provide participants with clear instructions and support throughout the process. Confusion about EPAs and competencies is widespread in HPE (ten Cate & Schumacher, 2022). To ensure that participants have a shared understanding of the term EPA and competency, it is important to provide clear definitions based on ten Cate's (2005) conceptual work. Participants were provided with a written document including informed consent information, a description of the Delphi methodology, the tasks participants will be asked to complete, and the concept of EPAs (see Appendix G). Participants were also notified to contact me via email for ongoing support throughout the study process.

Delphi Rounds

The number of rounds conducted in a Delphi study was determined before the start of a study. Based on a scoping review of the HPE literature, Delphi rounds typically range between 0 and 14 (Humphrey-Murto et al., 2017). This study employed a three-round modified Delphi process, which falls within the range of rounds noted in the literature, while also taking into consideration the tendency of participant response rates to decline the more rounds a Delphi study employs (Shang, 2023; Skulmoski et al., 2007). Instructions were given for each round (see Appendix H). After each round, participants received feedback on the average participant rating and standard deviation of responses on the questionnaire, along with the qualitative comments written by the other study participants.

Delphi Round 1

The first round presented EPAs found in the published peer-reviewed medical literature. Participants provided their opinions through Likert scoring and qualitative comments. Items that attained the criteria for consensus were considered resolved and not included in subsequent rounds. Also, participants were asked if they felt EPAs need to be added to the reviewed statements. Individuals described what influenced their opinions that were provided anonymously to other participants in subsequent rounds. Additionally, the researcher created revisions to existing EPAs based on qualitative feedback for participant consideration. The revised EPAs were crafted to align with the EQual rubric standards, ensuring high-quality EPA development.

Delphi Round 2

During the second round, the participants received feedback including the Likert score that they entered in Round 1, the average and standard deviation of the group scoring, and a complete list of blinded qualitative comments related to the survey statements. After receiving this feedback, the participants were asked to provide Likert scores and qualitative comments about the statements again to see if the feedback changed their opinion. Also, if new or revised EPAs were created based on prior feedback, participants could provide Likert scoring and qualitative responses to these items. Items that achieved consensus during this round were considered resolved and did not appear in the last round.

Delphi Round 3

During the third and final round, the participants again received feedback which included the Likert score that they entered in Round 2, the average and standard deviation

of the group scoring, and a complete list of blinded qualitative comments related to the survey statements. Participants were then asked to score and comment on these statements for a final opportunity to provide feedback for analysis.

Criteria for Dropping Statement Items

Questionnaire statements were evaluated to determine if the panel had reached a consensus. Based on prior Delphi studies, agreement by 75% of the panel participants on a statement was the consensus threshold for this study (Diamond et al., 2014). Statements not reaching this threshold were surveyed again in all rounds. There was an opportunity to consider criteria for keeping or dropping statements that fell short of this threshold (Diamond et al., 2014). Specifically, statements that achieved 51% to 74% consensus were included in the analysis because, while not reaching consensus criteria for this study, the statements indicate support from many of the panel participants and deserved discussion for future study.

Delphi Stopping Criteria

The stopping criteria for surveying a statement in the Delphi technique was met when consensus was reached by the above criteria, or the third Delphi round was completed. If consensus was reached before the third Delphi round, then the statement was considered to have reached consensus and was no longer surveyed.

Researcher's Positionality

Reflexivity involves examining the researcher's role in the research process and its potential impact on the findings (Walsh, 2003). By engaging in reflexivity, researchers can minimize undue influence on results or acknowledge inherent biases when they cannot be avoided. Through this reflective process, I have attempted to ensure that the

findings are not simply a reflection of my own assumptions but rather an authentic representation of the collective expertise of participants. In this study, I have critically reflected on my role and the research paradigm, which is the underlying worldview that shaped the study's design, execution, and interpretation.

Researcher's Role

As an educator, clinician, and policy advocate, my positionality informed my understanding of the expertise required in PA practice and the professional competencies essential for success. I recognized that my interpretation of the data was influenced by my prior knowledge and interactions within the PA profession. Ensuring adherence to the methodology concerning the defined consensus threshold to identify participant concurrence was important to ensure that the results reflected the participant's opinions rather than mine.

While Delphi study participants are unknown to each other, they need to be known to the researcher so that individualized feedback can be provided to the participant. This quasi-anonymity introduces the potential for bias, as participants may believe that there is a response that is more socially desirable than another. However, clear communication on my part that participants were being surveyed because of their expertise, and their opinions were sought as the study's purpose may have mitigated this concern.

Worldview

This study was grounded in a social constructivist paradigm, which is a worldview that recognizes that knowledge is co-constructed through social interactions and shaped by context, experience, and perspective (Vygotsky & Cole, 1978). From this

perspective, meaning is not discovered but rather constructed by individuals through their engagement with the world. My role as a researcher was not to remain a detached observer but to acknowledge how my experiences, assumptions, and professional background influenced the study. Rather than viewing objectivity as the absence of bias, I embraced the social constructivist approach by critically reflecting on my perspectives and how I interacted with the study participants. My approach acknowledged that meaning was shaped through discourse, professional norms, and individual experiences, making this study a collaborative construction of the participants' knowledge rather than a neutral presentation of facts.

Data Collection

The survey data were electronically collected using the Qualtrics platform, an online data collection and analysis tool. The following demographic information was obtained: age group, sex, PA education position, years in PA education, clinical practice area, the number of years in clinical practice, and zip code of their work address. Additionally, both qualitative comments and quantitative data, such as central tendencies (mean, median, mode, standard deviation), from each Delphi round were collected and anonymized for participant analysis in refining their opinions. To improve survey response rates for each Delphi round, notifications were sent via email on a Tuesday at 8 am Eastern Time (Lewis & Hess, 2017). Two email reminders were followed at one-week intervals, also on Tuesday mornings.

Data Analysis

In Delphi studies, the approach to data analysis is integral in effectively synthesizing expert opinions and guiding the consensus-building process. This analysis

uniquely combines both qualitative and opinion based quantitative data, ensuring a comprehensive understanding of participant perspectives. Through iterative rounds and feedback mechanisms, the Delphi method fostered a refined consensus that reflected the collective participant expertise and insights.

Opinion-based quantitative data in this Delphi study were analyzed for central tendencies with the mean and standard deviation. These statistical measures play a specific role in interpreting the data. The mean offers an average score of responses, reflecting the general tendency of opinions, which helps identify common ground and areas of alignment among Delphi study participants. Standard deviation, meanwhile, provides an understanding of the variation or dispersion from the average and indicates the level of consensus or divergence among responses, helping to identify the extent of agreement or disagreement within the panel's opinions. Holey et al. (2007) described the utility of these statistical measures in ensuring a systematic and transparent approach to interpreting Delphi study data. This approach emphasizes the importance of simple statistical measures to assess consensus and stability in Delphi studies, contributing to the overall reliability by quantifying agreement and ensuring validity through consistent and transparent data interpretation (Holey et al., 2007).

On the qualitative side, the analysis focused on comments and feedback from participants in each Delphi round. These qualitative inputs were essential as they provided deep insights into the reasoning behind the participants' opinions and choices regarding the questionnaire. This approach ensured further exploration for Likert scale data, supporting a nuanced interpretation of the data.

Qualitative data thematic analysis of participant comments was conducted using the six-phase framework established by Braun and Clarke (2006). This method was selected for its flexibility and clear guidelines, which align well with the study's social constructivist lens through which the EPAs for PAs were analyzed. Following Braun and Clarke's (2006) guidance, I completed the six steps of thematic analysis which included: 1) familiarizing yourself with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) producing the report. This systematic and reflexive approach supported a rich, nuanced interpretation of the data within its broader social and educational context.

Combining qualitative and opinion-based quantitative data in each Delphi round ensured a robust analysis and incorporated the participants' nuanced perspectives. This approach facilitated a more informed refinement of opinions in subsequent rounds, which guided the group toward consensus based on their previous responses. Furthermore, keeping the responses anonymous ensured that the opinions were unbiased by dominant narratives and reflective of the experts' independent views, which thereby enhanced the validity of the study's outcomes.

Trustworthiness of the Study

The Delphi technique is a structured communication method originally developed as a systematic, interactive method that relies on a panel of experts. There is recognition that the outcomes of the Delphi method are not to be considered irrefutable truths (Hasson & Keeney, 2011). Rather, they provide a glimpse into the perspectives of experts at a specific moment, which can then guide reflection, action, or theoretical development (Hasson & Keeney, 2011). When demonstrating trustworthiness to ensure inquirers

consider research findings noteworthy in qualitative research like the Delphi technique, scholars often turn to credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). The following illustrates how these concepts can be demonstrated in a Delphi technique study.

Credibility

Credibility efforts focus on assessing the degree to which the findings accurately reflect reality (Stahl & King, 2020). This can be achieved through prolonged engagement, persistent observation, and data triangulation (Lincoln & Guba, 1985). This study ensured persistent observation through implementing three successive Delphi rounds, each followed by ratings and comments from the participants. These rounds provided the experts with opportunities to reassess and refine their thoughts in response to insights from their peers. Input from others encouraged the participants to re-evaluate and alter their viewpoints, considering the group's shared expertise. The Delphi technique provided for member checking which is inherent to the methodology. The iterative rounds provided feedback on member responses and provided opportunities for Delphi members to confirm or further clarify their responses. Data triangulation was achieved as participants appraised EPA statements originally formulated within different HPE settings. Their assessments of each statement's significance through Likert-style ratings and qualitative feedback served to examine the pre-established statements by other experts and to measure the participants' reactions.

Confirmability

According to Lincoln and Guba (1985), it is essential to specify the elements in the audit trail with a strategy for the subsequent auditing process. Stahl and King (2020) highlight that confirmability is key for researchers to accurately represent the collective reality investigated in qualitative studies. The objective is to ascertain that the results reflect the experiences of the participants rather than the biases of the researcher (Hasson & Keeney, 2011; Stahl & King, 2020). This is verifiable through comprehensive documentation of the methodologies for data gathering and analysis (Hasson & Keeney, 2011).

To ensure confirmability as delineated by Lincoln and Guba (1985), I maintained a stance of objective positioning, approaching the study without imposing my own biases or influencing the participants' perspectives. This neutrality was fundamental in representing the collective reality as discussed by Stahl and King (2020). To accomplish this, the following strategies were employed: objective positioning, raw data availability, and reflexive commentary.

I was committed to maintaining a neutral role, carefully avoiding any influence on the participants' contributions, and ensuring that the findings accurately reflected the participants' experiences. All original data, such as individual responses from each phase of the study, were preserved and made accessible to the external auditor. This allowed the research outcomes to be transparent and traceable to the primary sources, thereby strengthening the study's confirmability. Alongside the data, I documented reflective notes detailing the decision-making process throughout the study. These notes included insights into potential biases and the measures taken to mitigate them, offering a clear

window into my efforts to remain impartial and focused on the participants' insights. These methods collectively ensured that the study's conclusions are rooted in the participants' inputs rather than my interpretations, aligning with the guidance of Stahl and King (2020) and Keeney et al. (2011) to verify the integrity and confirmability of the qualitative research findings.

Transferability

Transferability in qualitative research serves a role analogous to external validity in quantitative studies. It emphasizes the importance of rich, detailed narrative concerning the study's participants, settings, and contexts (Lincoln & Guba, 1985). This thorough depiction aids readers in assessing the findings' applicability to their specific contexts (Lincoln & Guba, 1985). By offering a thorough, nuanced description of the data, the research provides a foundation for external parties to evaluate the study's relevance to other settings.

This research aimed to clearly define participant expertise, which was crucial for interpreting the results. Participant demographics were analyzed to understand how well the panel's composition reflects the current PA professoriate and practice communities and how it may have affected study outcomes. A thorough explanation of the rating scale and participant comments were central to the analysis. Considering that the Delphi technique's foundational literature allowed flexibility in study design, prioritizing transparency in research decisions was crucial. This ensured a clear understanding of the methodology and the ability to adjust to added information. These efforts were to bolster the study's narrative to allow for readers to determine how this research may transfer to their application context.

Dependability

In establishing dependability within qualitative research methodologies, it is instrumental to incorporate measures that enhance the study's reliability and accuracy. Lincoln and Guba's (1985) proposition of an inquiry audit provided a systematic approach to validating the dependability of qualitative research. This mechanism introduces an independent evaluator into the research process. The designated auditor reviewed the procedural framework and the resultant research data, ensuring methodological consistency and data integrity (Lincoln & Guba, 1985). Furthermore, the mere anticipation of such a review may have prompted the primary researcher to execute the research with greater diligence and precision (Stahl & King, 2020).

A comprehensive audit trail was paramount to facilitate the inquiry. It entailed the documentation of every phase in the research trajectory. This documentation encompassed the articulation of the initial research problem, the selection of subject-matter experts, the methodologies of communication employed, the development and deployment of questionnaires, the iterative cycles of data collection, and the nature of feedback solicited and applied from the participating experts.

For this research, an external auditor who is an expert in PA education and programmatic evaluation reviewed the data. The auditor has experience as an ARC-PA accreditation program site visitor charged with confirming programmatic processes and outcomes. The individual holds a Doctor of Philosophy degree and is a seasoned researcher who was not a research participant. Also, the individual has extensive experience as a PA in clinical and educational practice and as a PA Program Director. The external auditor's role was to scrutinize the research process and outputs.

Ethical Considerations

Ethical considerations were fundamental to the integrity and validity of this modified Delphi study. They guided its conduct to safeguard the rights, dignity, and well-being of participants and the broader community. These considerations adhere to moral principles and standards critical to qualitative research. This section outlines the essential ethical considerations for this study, emphasizing adherence to ethical norms and standards.

Confidentiality and Anonymity

Confidentiality and anonymity are vital in the Delphi method due to its quasi-anonymous nature (Keeney et al., 2006). Participants' identities are protected from each other, while transparent communication is maintained between the researcher and individual participants. This approach ensures data security, respects participants' privacy, and encourages candid feedback, contributing significantly to the study's validity.

Informed Consent

The University of Maryland, Baltimore Institutional Review Board determined that written informed consent was not necessary for this research which was exempt from review. However, consent information and participant education were provided to each participant to communicate details about this research (see Appendix G).

Institutional Review Board

Approval by an Institutional Review Board ensured that the study meets ethical standards for protecting human subjects in research.

Bias and Researcher Influence

The researcher's role in qualitative research, especially in a modified Delphi study, required careful consideration of potential biases. Reflexivity involved continuous reflection on my role and influence throughout the research process. This approach ensures that findings genuinely represent participants' views and not mine.

Ethical Use of Expert Opinion

The reliance on expert opinion in the modified Delphi method necessitates careful ethical consideration. Experts are selected based on transparent and objective criteria, ensuring a fair representation of views. At the same time, the study acknowledges the limitation that the panel does not represent all views within the PA community. This study aimed to provide insight into experts' perspectives during the research period. This underlines the need for future research to incorporate other sources of valid evidence to build on this work.

Research Integrity and Quality

Upholding research integrity and quality is a fundamental ethical obligation in this study. The research ensures credible, reliable, and valid findings by adhering to rigorous methodological standards findings. Every phase of the research, from the careful selection of participants to meticulous data analysis, was conducted with a commitment to the highest levels of integrity and ethical standards. These practices are crucial for the validity of the study's outcomes and for maintaining the trust and respect of the research community and study participants.

Transparency and Dissemination

Ethical research practice includes transparent reporting and dissemination of findings. The study reported its results honestly, including limitations, to contribute constructively to the field of health professions education. This transparency is crucial for the study's credibility and its contribution to academic discourse.

Cultural and Contextual Sensitivity

Recognizing the diversity in PA practice and education is a critical aspect of this study, which is conducted with a keen awareness of cultural and systemic differences. The research methodology for EPA development is designed to be sensitive to these differences, ensuring their applicability and relevance in various contexts. This approach was pivotal in ensuring that the EPAs accurately reflected the diverse realities and challenges encountered in PA practice, catering to a wide spectrum of educational and clinical environments.

Summary

Chapter Three outlined the methodology of this modified Delphi study aimed at developing EPAs for newly graduated PAs. This chapter began by establishing the study's primary objective: to engage expert opinions in PA education and clinical practice in identifying and agreeing on essential EPAs. The modified Delphi technique, a qualitative research method involving iterative rounds of expert consultations, is central to this process. A portion of this chapter was dedicated to discussing the researcher's role, emphasizing the importance of reflexivity in qualitative research. This exploration is critical in understanding how the researcher's perspectives and interactions might

influence the study and the measures taken to mitigate potential biases. The methodology for data collection and analysis was elaborated upon, highlighting the integration of qualitative and quantitative methods. This section detailed how data from the Delphi rounds were collected, analyzed, and presented, ensuring a robust and comprehensive understanding of the experts' consensus. Recognizing the inherent challenges in Delphi studies, the chapter addresses potential limitations such as the lack of standardized guidelines for conducting Delphi research and the quasi-anonymity of participants. Strategies for overcoming these challenges are discussed, ensuring the study's rigor and validity. Ethical considerations form an essential part of the chapter, with a focus on Institutional Review Board review, maintaining confidentiality, obtaining informed consent, and ensuring the integrity and ethical conduct of the research.

CHAPTER 4: FINDINGS

Introduction

The purpose of this modified Delphi study was to achieve consensus among expert PA educators who are also active clinicians to develop EPAs for the PA educational community. These EPAs are tailored for entry-level PA graduates and are grounded in the current Competencies for the PA Profession. This chapter presents data related to the participants, consensus development and the results of the Delphi study, which aimed to answer the research question. The participant data provides an overview of the professional roles and demographic characteristics of the study participants. The Delphi study findings are presented in terms of EPA inclusion to address the research question.

Participants

A total of 35 individuals participated in this study, with participants representing a diversity of professional and personal backgrounds. The detailed analysis below highlights the key attributes of the participants, including educational roles, academic rank, years of experience in PA education and clinical practice, clinical practice areas, gender, age, race, and ethnicity.

PA Education Roles

The participants in this study held various roles within their educational programs (see Table 8). Among them, 37.1% ($n = 13$) were Principal Faculty, making this the most represented role within PA education. Clinical Directors constituted 17.1% ($n = 6$), while Preceptors and Program Directors each accounted for 14.3% ($n = 5$). The remaining roles

included Associate / Assistant Directors (5.7%, $n = 2$), Didactic Directors (5.7%, $n = 2$), and Vice Dean / Chair (5.7%, $n = 2$).

Table 8

PA Education Title

Title	Count	Percentage
Principal Faculty	13	37.1%
Director of Clinical Education	6	17.1%
Preceptor	5	14.3%
Program Director	5	14.3%
Associate / Assistant Director	2	5.7%
Director of Didactic Education	2	5.7%
Vice Dean / Chair	2	5.7%
	35	100.0%

Academic Rank

Of the 30 participants who provided information about their academic rank (excluding the 5 preceptors), most participants held early-career positions (see Table 9). Assistant Professors comprised the largest group, making up 66.7% ($n = 20$) of respondents, followed by Associate Professors at 30% ($n = 9$). Only one participant (3.3%) reported holding the rank of Professor. This distribution underscores the predominance of early-career educators among the respondents, with few occupying senior academic ranks.

Table 9

Academic Rank

Academic Rank	Count	Percentage
Assistant Professor	20	57.1%
Associate Professor	9	25.7%
Professor	1	2.9%
Preceptor (No academic rank)	5	14.3%
	35	100.0%

PA Education Experience

Participants in this study had a diverse range of experience levels within PA education, ensuring a breadth of perspectives in the modified Delphi process (see Table 10). All full-time PA educators had at least five years of PA education experience, serving as a surrogate for expertise in this study. The largest group of participants, 42.9% ($n = 15$), reported five to nine years of experience, exceeding the national average of 27.5% for faculty and 30.9% for program directors (PA Education Association, 2024). This overrepresentation of mid-career professionals' contrasts with national trends, where 33.3% of faculty and 7.8% of program directors have less than five years of experience (PA Education Association, 2024).

The next largest group, 28.6% ($n = 10$), had 10 to 14 years of experience, closely aligning with national data, where 14.3% of faculty and 24.4% of program directors fall within this range (PA Education Association, 2024). Additionally, 20% ($n = 7$) of participants reported 15 or more years of experience, compared to the national figures of 17.4% for faculty and 36.4% for program directors (PA Education Association, 2024). A

smaller proportion of the sample, 8.6% ($n = 3$), had 2 to 4 years of PA precepting experience.

Table 10

Years in PA Education

	Count	Percentage
2 - 4 years	3	8.6%
5 - 9 years	15	42.9%
10 - 14 years	10	28.6%
15+ years	7	20.0%
	35	100.0%

Clinical Practice Areas

The participants' clinical practice areas reflect diverse specialties, with distributions summarized in Table 11. The largest two groups, Primary Care / Family Medicine and Emergency Medicine / Urgent Care, each account for 25.7% ($n = 9$) of the sample. This proportion is higher than national data, which reported 12.7 to 16.3% for primary care and 9.1 to 9.5% for emergency medicine (PA Education Association, 2024). Inpatient Specialties, including hospitalist and critical care, represented 14.3% ($n = 5$) of participants, an increase from the national range of 4.1 to 4.3%. Similarly, 14.3% ($n = 5$) of participants worked in other specialties, encompassing Dermatology ($n = 1$), Obstetrics and Gynecology (OB/GYN) ($n = 2$), Psychiatry ($n = 1$), and Occupational Medicine ($n = 1$). These findings exceed the national range of 8.4 to 11.9%, Surgical Subspecialties (11.4%, $n = 4$) closely match national data, which ranges from 8.4% to 12% (PA Education Association, 2024). Internal Medicine Subspecialties represent 8.6% ($n = 3$), slightly surpassing the national figures of 4.3% to 5.1%.

Table 11*Clinical Practice Areas*

	Count	Percentage
Primary Care / Family Medicine	9	25.7%
Emergency Medicine / Urgent Care	9	25.7%
Inpatient Specialties (hospitalist/critical care)	5	14.3%
Other - Dermatology (1), OB/GYN (2), Psychiatry (1), Occupational Medicine (1)	5	14.3%
Surgical Subspecialties	4	11.4%
Internal Medicine Subspecialties	3	8.6%
	35	100.0%

Clinical Practice Experience

The participants' clinical practice experience spans a wide range, with all participants having at least 10 years of experience (see Table 12). The largest groups are those with 10 to 14 years of clinical experience and those with 20 or more years of experience, each comprising 13 participants (37.1%). These proportions are notably higher than the national averages reported in the AAPA Salary Report (2024), where 14.2% of PAs have 10 to 14 years of experience, and only 16.6% have over 20 years of experience. A smaller group, nine participants (25.7%), reported having 15 to 19 years of experience, which also exceeds the national average of 9.6%.

Table 12*Years of Clinical Experience*

	Count	Percentage
10 - 14 years	13	37.1%
15 - 19 years	9	25.7%
20+ years	13	37.1%
	35	100%

Gender

The gender demographics of the 35 participants reveal a skew toward female participants (see Table 13). Of the total, 23 participants (65.7%) identified as female, while 12 (34.3%) identified as male. No participants selected the options for Non-binary or Prefer Not to Say. This distribution reflects national trends detailed in the PAEA Faculty and Directors Report 5 (2024), indicating that women represent the majority in PA education roles, ranging from 62.3% to 69.6% of faculty and program administrators.

Table 13

Gender

	Count	Percentage
Female	23	65.7%
Male	12	34.4%
	35	100.0%

Age

The participants' age demographics reveal a concentration in the middle age range, offering valuable insights into the professional stages of the cohort (see Table 14). The largest age group was 40 to 49 years, comprising 18 participants (51.4%). This was followed by the 50 to 59 age group, with 8 participants (22.9%). Participants aged 30 to 39 accounted for 6 individuals (17.1%), while the smallest group, those aged 60 to 69, included 3 participants (8.6%).

This distribution highlights that the majority (74.3%) of participants were between 40 and 59 years old, representing mid- to late-career professionals. In contrast, fewer participants were in the younger (30 to 39 years) and older (60 to 69 years) age

brackets. This pattern aligns with the median ages reported in the PAEA Faculty and Directors Report 5 (2024), which similarly observed a concentration in the 40 to 59 years age.

Table 14

Age Distribution

	Count	Percentage
30 - 39 years	6	17.1%
40 - 49 years	18	51.4%
50 - 59 years	8	22.9%
60 - 69 years	3	8.6%
	35	100.0%

Race and Ethnicity

The study participants’ racial demographics show that the majority identified as White, with 29 participants (82.9%) in this category (see Table 15). There are fewer people who indicated being White in this sample than what is reported in national PA education data, where individuals identifying as White represent a higher proportion of the PA education population (85.5 – 89.1%) (PA Education Association, 2024). When excluding those who preferred not to report their race, White participants accounted for 87.9% of the sample, closely aligning with national figures. Those identifying with another race collectively made up 12.1%, aligning with the national range of 10.9% to 14.5% for non-White individuals in PA education.

Other racial groups were represented in smaller proportions, with 2.9% of study participants from each category identifying as Black or African American, American Indian or Alaska Native, two or more races, and some other race, respectively.

Nationally, these proportions are 4.3% – 5% for Black or African American, 0.5% – 0.6% for American Indian or Alaska Native, 0.9% – 2% for individuals identifying as two or more races, and 0% – 2% for some other race (PA Education Association, 2024).. Additionally, two participants (5.7%) in this study chose not to disclose their racial identity, slightly higher than the 3.1% – 3.2% who chose this category nationally (PA Education Association, 2024).

Regarding ethnicity, most participants ($n = 34$, 97.1%) identified as neither Hispanic nor Latino, while one (2.9%) identified as Hispanic or Latino. National figures for Hispanic or Latino faculty and directors range from 4.6% to 5% (PA Education Association, 2024), placing this study's proportion slightly below the national range.

When examining underrepresented minority (URM) status, which includes individuals who identify as Hispanic, a single non-White race, or a non-White race in combination with White race, this study's URM proportion (14.3%) reflects a similar demographic composition to that observed in PA education. Nationally, URMs comprise 11.8% to 14.2% of PA faculty and directors (PA Education Association, 2024), placing this study's demographics well within the expected range for the PA education population. The URM count of 5 includes one participant identifying as Hispanic or Latino and one participant each from the categories of Black or African American, American Indian or Alaska Native, two or more races, and some other race.

Table 15*Race and Ethnicity*

Race	Count	Percentage
American Indian or Alaska Native	1	2.9%
Black or African American	1	2.9%
White	29	82.9%
Two or more races	1	2.9%
Some other race	1	2.9%
Prefer not to answer	2	5.7%
	35	100.0%

Ethnicity	Count	Percentage
Hispanic or Latino	1	2.9%
Not Hispanic or Latino	34	97.1%
	35	100.0%

Participants by United States Region

Table 16 summarizes the geographic distribution of participants based on self-reported ZIP codes of their primary employers. Of the 35 total participants, 11 were employed in the Midwest and another 11 in the South. Six participants were affiliated with employers in the Northeast, and five in the West. An additional two participants did not report their employer ZIP code. No Delphi participants reported primary employment in the Northwest, Hawaii, Alaska, or U.S. territories.

Table 16*Participants by United States Region*

US Region	Participants	Percentage
Midwest	11	31.4%
South	11	31.4%
Northeast	6	17.1%
West	5	14.3%
Did Not Report	2	6.7%
Total	35	100%

Response Rate

A total of 35 participants were invited to participate in all three rounds (see Table 17). In the first round, all 35 participants started and completed the survey, resulting in a 100% completion rate. By the second round, 30 participants completed the survey, reflecting an 86% completion rate. In the third round, all 35 participants were invited again, with 28 starting the survey. Of those 28 who started the survey, 26 participants completed it, yielding a completion rate of 74%. Data from the two participants who started the survey but did not respond to all survey questions in Round 3 were included in the results.

Table 17*Survey Response Rate*

	Invited	Started	Completed	Completed Response Rate
Round 1	35	35	35	100%
Round 2	35	30	30	86%
Round 3	35	28	26	74%

Note. All participants were invited to each round. Data from incomplete surveys in Round 3 was included in survey results.

Consensus Development

With the completion of the Delphi process, 12 out of the original 20 EPAs reached a consensus at the 75% threshold. Additionally, three EPAs received a consensus between 51% and 74%. Five other EPAs had less than 50% consensus.

Results

Data Presentation and Response Coding

The data reflects expert opinions on whether an EPA should be included in the framework for new PA graduates. For calculating descriptive statistics, EPA inclusion responses were coded as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. The following section reports on the range of responses, represented by the number and percentage of agreement on the 5-point Likert scale and the measures of central tendency for each EPA across each round.

Round 1

In Round 1 of the Delphi process, 10 EPAs surpassed the 75% consensus threshold. Ranked in order of participant agreement, these 10 included tasks participants described as “foundational:” 1) *Prioritizing a Differential Diagnosis Following a Clinical Encounter* (88.57%), 2) *Documenting a Clinical Encounter in the Patient Record* (88.57%), 3) *Gathering a History and Performing a Physical Examination* (88.24%), 4) *Providing Preventive Healthcare Services and Education* (88.24%), 5) *Recommending and Interpreting Common Diagnostic and Screening Tests* (82.35%), 6) *Conducting Culturally Competent Patient Interviews and Assessments* (76.47%), 7) *Providing an Oral Presentation of a Clinical Encounter* (82.86%), 8) *Developing and Implementing Patient Management Plans* (77.14%), 9) *Entering and Discussing Orders and*

Prescriptions (76.47%), and 10) *Facilitating Relationship Building Through Communication* (75.76%) (see Table 18 for Likert scoring and Table 19 for measures of central tendency for each EPA).

Participants described these high-consensus EPAs as workplace activities that are necessary on the first day of PA practice, frequently referring to them as a “bedrock” for safe and effective patient care. One participant emphasized the importance of generating differentials: “This is a core task. Failure to generate an appropriate differential is one of the biggest shortcomings of new PAs.” Other participants stressed the fundamental nature of history-taking and physical exam proficiency. As one remarked, “Another foundational EPA. I would not graduate a student who did not display competency in history and physical and would expect them to be able to perform these skills appropriately ... as a new graduate PA.” Participants viewed a lack of autonomy in these areas as unacceptable for new graduates, with one stating, “If new graduates can’t do this (gather a history and perform a physical examination) unsupervised, they’re a hazard to their patients.”

Table 18

Round 1 EPA Inclusion Results

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Total <i>n</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Prioritize a differential diagnosis following a clinical encounter	0	0%	0	0%	0	0%	4	11.43%	31	88.57%	35
Document a clinical encounter in the patient record	1	2.86%	0	0%	0	0%	3	8.57%	31	88.57%	35
Gather a history and perform a physical examination	0	0%	0	0%	0	0%	4	11.76%	30	88.24%	34
Provide preventive health care services and education	0	0%	0	0%	1	2.94%	3	8.82%	30	88.24%	34
Provide an oral presentation of a clinical encounter	0	0%	0	0%	1	2.86%	5	14.29%	29	82.86%	35
Recommend and interpret common diagnostic and screening tests	0	0%	0	0%	0	0%	6	17.65%	28	82.35%	34
Develop and implement patient management plans	0	0%	0	0%	1	2.86%	7	20%	27	77.14%	35
Enter and discuss orders and prescriptions	0	0%	0	0%	0	0%	8	23.53%	26	76.47%	34
Conduct culturally competent patient interviews and assessments.	0	0%	0	0%	1	2.94%	7	20.59%	26	76.47%	34
Facilitate relationship building through communication	0	0%	0	0%	1	3.03%	7	21.21%	25	75.76%	33
Recognize a patient requiring urgent or emergent care and initiate evaluation and management	0	0%	0	0%	1	2.94%	9	26.47%	24	70.59%	34
Improve clinical practice through reflective learning	0	0%	1	2.94%	4	11.76%	8	23.53%	21	61.76%	34
Form clinical questions and retrieve evidence to advance patient care	1	2.86%	0	0%	3	8.57%	10	28.57%	21	60%	35
Critically analyze and apply biomedical knowledge	0	0%	1	2.94%	7	20.59%	6	17.65%	20	58.82%	34
Obtain informed consent for tests and/or procedures	0	0%	0	0%	4	11.43%	11	34.43%	20	57.14%	35
Demonstrate collaborative care coordination	0	0%	1	2.94%	4	11.76%	11	32.35%	18	52.94%	34
Perform medical coding and billing for patient encounters.	0	0%	3	8.82%	5	14.71%	10	29.41%	16	47.06%	34
Evaluate ethical dilemmas in patient care	0	0%	1	2.94%	7	20.59%	11	32.35%	15	44.12%	34
Give or receive a patient handover to transition care responsibility	0	0%	0	0%	5	14.71%	15	44.12%	14	41.18%	34
Perform general procedures of a PA	0	0%	3	9.38%	8	25%	11	34.38%	10	31.25%	32
Provide transfer of care in a variety of settings	1	2.94%	0	0%	13	28.34%	12	35.29%	1	2.94%	34

Note. The table presents Round 1 EPAs, the means of the Likert-scale responses are ranked from highest to lowest percentages of Strongly Agree responses. EPAs meeting the 75% inclusion threshold are highlighted with bold percentages. The *n* columns show the number of participants selecting each Likert-scale option, while the % columns display the corresponding percentages. The Total *n* column indicates the overall number of participants who responded to each statement.

Table 19*Round 1 EPA Central Tendency*

Entrustable Professional Activity	Mean	Standard Deviation
Prioritize a differential diagnosis following a clinical encounter	4.89	0.32
Gather a history and perform a physical examination	4.88	0.33
Provide preventive health care services and education	4.85	0.44
Recommend and interpret common diagnostic and screening tests	4.82	0.39
Document a clinical encounter in the patient record	4.80	0.72
Provide an oral presentation of a clinical encounter	4.80	0.47
Enter and discuss orders and prescriptions	4.76	0.42
Develop and implement patient management plans	4.74	0.51
Conduct culturally competent patient interviews and assessments.	4.74	0.51
Facilitate relationship building through communication	4.73	0.52
Recognize a patient requiring urgent or emergent care and initiate evaluation and management	4.68	0.53
Obtain informed consent for tests and/or procedures	4.46	0.70
Improve clinical practice through reflective learning	4.44	0.82
Form clinical questions and retrieve evidence to advance patient care	4.43	0.88
Critically analyze and apply biomedical knowledge	4.43	0.91
Demonstrate collaborative care coordination	4.35	0.81
Give or receive a patient handover to transition care responsibility	4.26	0.71
Evaluate ethical dilemmas in patient care	4.18	0.87
Perform medical coding and billing for patient encounters.	4.15	0.99
Perform general procedures of a PA	3.88	0.98
Provide transfer of care in a variety of settings	3.76	0.92

Note. The table presents Round 1 EPAs, ranked from highest to lowest means of Likert-scale responses. EPAs that met the 75% inclusion threshold are highlighted with bold mean scores.

A total of 11 EPAs did not achieve consensus in the first round. Of the 11 EPAs not meeting consensus in Round 1, 51%-74% of participants indicated strong agreement with the following six EPAs: 1) *Recognizing a Patient Requiring Urgent or Emergent Care and Initiating Evaluation and Management*, 2) *Improving Clinical Practice Through Reflective Learning*, 3) *Forming Clinical Questions and Retrieving Evidence to Advance Patient Care*, 4) *Critically Analyzing and Applying Biomedical Knowledge*, 5) *Obtaining Informed Consent for Tests* and 6) *Demonstrating Collaborative Care Coordination* (see Table 18). Five EPAs received the lowest levels of endorsement for

inclusion within the EPA framework, with less than 50% of participants strongly agreeing. These five EPAs included: 1) *Performing Medical Coding and Billing for Patient Encounters* 2) *Evaluating Ethical Dilemmas in Patient Care*, 3) *Giving or Receiving a Patient Handover to Transition Care Responsibility*, 4) *Performing General Procedures of a PA*, and 5) *Providing Transfer of Care in a Variety of Settings*.

To gain insight into why certain EPAs reached consensus while others did not, qualitative data from Round 1 were examined and grouped into four themes: Foundational Skills, Context and Specialty Dependence, Risk and Liability, and Unclear or Overlapping Definitions (see Table 20). This thematic categorization provided deeper insight into the factors shaping participants' perceptions of whether an EPA should be included in the framework. These often reflected the interplay between clinical expectations, practice variability, and the perceived responsibilities of new PA graduates.

Table 20

Round 1 Qualitative Themes

Theme	Definition
Foundational Skills	Skills viewed as essential for safe and effective entry-level PA practice. These tasks were considered critical to ensuring patient safety, proper clinical decision-making, and fundamental competency for new graduates.
Context and Specialty Dependence	Some EPAs were seen as highly dependent on specific practice settings or specialties. Participants noted that some tasks were not universally necessary for all new PAs and would require additional training based on the chosen specialty or work environment.
Risk and Liability	EPAs associated with higher risk and liability were often considered important but required team-based collaboration.
Unclear or Overlapping Definitions	Some EPAs were perceived as lacking clarity or having overlapping interpretations. Participants often expressed confusion regarding the scope of these tasks, questioning their applicability across various clinical contexts and practice settings.

Participants emphasized that certain EPAs were foundational skills for safe entry-level practice, describing them as the essential "bedrock" of a new PA's skillset. These tasks were seen as fundamental to ensuring patient safety and effective clinical decision-making from the outset of practice. One participant highlighted this perspective: "These are foundational elements of clinical practice. Competency should be expected of PA students prior to graduation." This assertion underscored the necessity of these skills, reinforcing the expectation that new PAs must be proficient in these clinical activities from the start of their careers.

EPAs that were more relevant to specific contexts and specialties, such as advanced procedures in critical care, raised questions about their universal necessity. One participant noted, "Critical care medicine ... is a marathon, not a sprint. Our new graduates require initial guidance when applying biomedical knowledge." This sentiment underscored the notion that certain activities might be specialty-specific rather than broadly applicable to all newly graduated PAs.

EPAs perceived as associated with risk and liability, such as ethical dilemmas and obtaining informed consent, were acknowledged as important. However, participants believed that these tasks often required team-based solutions. The potential for high-risk decision-making necessitated structured support for optimal patient outcomes.

Some EPAs lacked specificity, making it difficult for participants to endorse them strongly. For instance, the EPA to *Perform the General Procedures of a PA* prompted confusion, with one participant commenting, "I do not know what general procedures of a PA are, and they are specific to specific specialties." One participant questioned the scope of the procedural EPA, stating, "I don't actually know what this means. Is it talking

about doing procedures (suturing, splinting, etc.), or is it talking about general professional skills of being a PA?” This suggested that a lack of consensus on certain EPAs was not necessarily due to opposition but rather concerns regarding clarity of the EPA.

Analysis of Likert-scale ratings and qualitative comments revealed areas where the original EPAs required greater clarity (see Table 21). As a result, five EPAs were revised to reflect the insights gathered in Round 1 for consideration in Round 2. In contrast, the other six EPAs were not revised because there were no indications from participants that revisions were warranted. See Table 19 for the original EPA statement from Round 1 and the revised EPA statement to be included in Round 2.

Table 21

Initial EPAs Revised for Consideration in Round 2

Initial EPA	Revised EPA	Reason for Revising the EPA
Improve Clinical Practice through Reflective Learning	Continuously Improve Clinical Practice through Reflective Learning, Independently Integrating Feedback to Support Lifelong Professional Development	Participants with various Likert-indications which suggested EPA ambiguity
Evaluate Ethical Dilemmas in Patient Care	Identify and Evaluate Ethical Dilemmas in Patient Care, Collaborating with Multidisciplinary Teams to Ensure Comprehensive and Ethically Sound Decision-Making.	Qualitative comments sought further clarity
Provide Transfer of Care in a Variety of Settings	Facilitate the Transfer of Patient Care Between Providers and Across Various Clinical Settings, Ensuring Continuity and Safety	Qualitative comments suggested initial EPA was vague
Perform the General Procedures of a PA	Demonstrate Proficiency in Performing Essential Primary Care Procedures, Adapting Practices to Patient Needs and Clinical Settings	Qualitative comments described the initial EPA as "vague," "too broad," and "undefined"
Perform Medical Coding and Billing for Patient Encounters	Complete Accurate Medical Coding and Billing for Patient Encounters in Various Clinical Settings, Using Initial Feedback to Improve Practices	Diverse Likert and qualitative data regarding the initial EPA's inclusion

The EPA, originally titled *Improve Clinical Practice through Reflective Learning*, was revised to *Continuously Improve Clinical Practice through Reflective Learning, Independently Integrating Feedback to Support Lifelong Professional Development*. This change was prompted by the diverse Likert-scale responses, which suggested that the original statement was ambiguous.

Similarly, the *EPA to Evaluate Ethical Dilemmas in Patient Care* was revised to *Identify and Evaluate Ethical Dilemmas in Patient Care, Collaborating with Multidisciplinary Teams to Ensure Comprehensive and Ethically Sound Decision-Making*. Qualitative comments indicated that the original EPA lacked sufficient detail and failed to emphasize the collaborative nature of ethical decision-making in clinical practice. The revised statement better reflected the importance of teamwork and integrating multiple perspectives when addressing ethical challenges.

Another EPA, *Provide Transfer of Care in a Variety of Settings*, was updated to *Facilitate the Transfer of Patient Care Between Providers and Across Various Clinical Settings, Ensuring Continuity and Safety*. Participants described the initial version as vague, with insufficient focus on the critical aspects of continuity and patient safety. The revised EPA addressed these concerns by highlighting the processes necessary for effective care transitions in diverse settings.

The original EPA to *Perform the General Procedures of a PA* was also revised in response to feedback that described it as too broad and undefined. The updated version, *Demonstrate Proficiency in Performing Essential Primary Care Procedures, Adapting Practices to Patient Needs and Clinical Settings*, provided greater specificity by focusing

on primary care procedures and tailoring practices to meet individual patient needs and the demands of different clinical environments.

Finally, the EPA to *Perform Medical Coding and Billing for Patient Encounters* underwent revision following the analysis of varied Likert-scale responses and qualitative feedback. The revised version, *Complete Accurate Medical Coding and Billing for Patient Encounters in Various Clinical Settings, Using Initial Feedback to Improve Practices*, added context by situating coding and billing within clinical workflows and emphasizing the iterative nature of learning and improvement.

Round 2

Following initial refinements from Round 1, the panel reassessed 11 proposed EPAs. In the second round of the Delphi process, one additional EPA met the pre-established 75% consensus threshold (see Table 20). This brought the total number of EPAs reaching consensus to 11 (10 EPAs from Round 1 and 1 EPA from Round 2). The EPA identified for inclusion was *Continuously Improve Clinical Practice Through Reflective Learning, Independently Integrating Feedback to Support Lifelong Professional Development* (89.29%) (see Table 22 for Likert scoring and Table 23 for measures of central tendency). Notably, this EPA had been revised during Round 1 in response to varying participant opinions.

Table 22

Round 2 EPA Inclusion Results

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Total <i>n</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Continuously improve clinical practice through reflective learning, independently integrating feedback to support lifelong professional development.	0	0.00%	0	0.00%	0	0.00%	3	10.71%	25	89.29%	28
Recognize a patient requiring urgent or emergent care and initiate evaluation and management	0	0.00%	0	0.00%	1	3.45%	9	31.03%	19	65.52%	29
Form clinical questions and retrieve evidence to advance patient care	0	0.00%	0	0.00%	3	10.34%	8	27.59%	18	62.07%	29
Identify and evaluate ethical dilemmas in patient care, collaborating with multidisciplinary teams to ensure comprehensive and ethically sound decision-making.	0	0.00%	1	3.45%	2	6.90%	8	27.59%	18	62.07%	29
Obtain informed consent for tests and/or procedures	0	0.00%	0	0.00%	0	0.00%	12	42.86%	16	57.14%	28
Critically analyze and apply biomedical knowledge	1	3.45%	0	0.00%	3	10.34%	10	34.48%	15	51.72%	29
Demonstrate collaborative care coordination	1	3.45%	0	0.00%	3	10.34%	11	37.93%	14	48.28%	29
Facilitate the transfer of patient care between providers and across various clinical settings, ensuring continuity and safety.	1	3.45%	0	0.00%	1	3.45%	13	44.83%	14	48.28%	29
Give or receive a patient handover to transition care responsibility	0	0.00%	1	3.45%	3	10.34%	12	41.38%	13	44.83%	29
Complete accurate medical coding and billing for patient encounters in various clinical settings, using initial feedback to improve practices.	0	0.00%	1	3.45%	5	17.24%	11	37.93%	12	41.38%	29
Demonstrate proficiency in performing essential primary care procedures, adapting practices to patient needs and clinical settings.	2	6.90%	1	3.45%	3	10.34%	15	51.72%	8	27.59%	29

Note. The table presents Round 2 EPAs, the means of the Likert-scale responses are ranked from highest to lowest percentages of Strongly Agree responses. EPAs meeting the 75% inclusion threshold are highlighted with bold percentages. The *n* columns show the number of participants selecting each Likert-scale option, while the % columns display the corresponding percentages. The Total *n* column indicates the overall number of participants who responded to each statement.

Table 23*Round 2 EPA Central Tendency*

Entrustable Professional Activity	Mean	Standard Deviation
Continuously improve clinical practice through reflective learning, independently integrating feedback to support lifelong professional development.	4.89	0.31
Recognize a patient requiring urgent or emergent care and initiate evaluation and management	4.62	0.56
Form clinical questions and retrieve evidence to advance patient care	4.52	0.69
Identify and evaluate ethical dilemmas in patient care, collaborating with multidisciplinary teams to ensure comprehensive and ethically sound decision-making.	4.48	0.78
Obtain informed consent for tests and/or procedures	4.57	0.50
Critically analyze and apply biomedical knowledge	4.31	0.93
Demonstrate collaborative care coordination	4.28	0.92
Facilitate the transfer of patient care between providers and across various clinical settings, ensuring continuity and safety.	4.34	0.86
Give or receive a patient handover to transition care responsibility	4.28	0.80
Complete accurate medical coding and billing for patient encounters in various clinical settings, using initial feedback to improve practices.	4.17	0.85
Demonstrate proficiency in performing essential primary care procedures, adapting practices to patient needs and clinical settings.	3.90	1.08

Note. The table presents Round 2 EPAs, ranked from highest to lowest means of Likert-scale responses. EPAs that met the 75% inclusion threshold are highlighted with bold mean scores.

The following five EPAs received moderate support (51%-74% strongly agree):

1) *Recognize a Patient Requiring Urgent or Emergent Care and Initiate Evaluation and Management* (65.52%), 2) *Form Clinical Questions and Retrieve Evidence to Advance Patient Care* (62.07%), 3) *Identify and Evaluate Ethical Dilemmas in Patient Care, Collaborating with Multidisciplinary Teams to Ensure Comprehensive and Ethically Sound Decision-Making* (62.07%), 4) *Obtain Informed Consent for Tests and/or Procedures* (57.14%), 5) *Critically Analyze and Apply Biomedical Knowledge* (51.72%) (see Table 22). The remaining EPAs were below 50% Strongly Agree: 1) *Demonstrate Collaborative Care Coordination*, 2) *Facilitate the Transfer of Patient Care Between Providers and Across Various Clinical Settings, Ensuring Continuity and Safety*, 3) *Give*

or Receive a Patient Handover to Transition Care Responsibility, 4) Complete Accurate Medical Coding and Billing for Patient Encounters in Various Clinical Settings, Using Initial Feedback to Improve Practices, 5) Demonstrate Proficiency in Performing Essential Primary Care Procedures, Adapting Practices to Patient Needs and Clinical Settings (see Table 22). Despite these EPAs falling below 50%, all had a combined Agree and Strongly Agree alignment of greater than 75%.

Continued participant comment review enabled further EPA refinement. Expert feedback indicated that the EPA to *Give or Receive a Patient Handover to Transition Care Responsibility* was indistinguishable from *Facilitate the Transfer of Patient Care Between Providers and Across Various Clinical Settings, Ensuring Continuity and Safety*. Therefore, the former was eliminated in favor of the more comprehensive statement.

Table 24

Round 2 Qualitative Themes

Theme	Definition
Foundational vs. Specialized	Captures whether an EPA is viewed as universally essential (foundational) for all new PA graduates or more practice-specific (specialized). EPAs seen as central for clinical practice garner higher consensus; those considered setting- or specialty-dependent receive mixed support.
Clarity, Overlaps, and Measurability	Addresses how clear and distinct an EPA is from others, and whether it can be concretely measured. EPAs that are overly broad, redundant, or conceptually vague face lower consensus; those with specific, easily observable tasks are more strongly endorsed.
Ethical and Professional Imperatives	Highlights EPAs that carry strong legal, ethical, or professional importance (e.g., informed consent, ethical dilemmas). Even if difficult to measure, these are often more highly recommended for inclusion due to high stakes in patient care and professional standards.

The qualitative responses grouped around three key themes: Foundational vs. Specialized; Clarity, Overlaps, and Measurability; and Ethical and Professional Imperatives (see Table 24). Each theme provided insight into why certain EPAs received stronger endorsements than others. Representative ideas and quotes further illustrate participants' rationale for EPA inclusion.

Participants distinguished EPAs considered universally essential from those more aligned with specific practice settings in the Foundational vs. Specialized theme. They labeled reflective practice and urgent-care recognition as fundamental activities for any new PA, with one participant describing reflective learning as “a core competency for PA graduates.” Another emphasized that timely detection of emergent conditions was an expected skill for all graduates. In contrast, tasks like billing/coding and procedural proficiency yielded lower Strongly Agree percentages, likely because many panelists deemed them specialty-specific or learned on the job. As one respondent said, “We have billers for this, and it is a learned skill.”

Beyond the distinction between universal and specialty skills, participants also highlighted challenges related to wording precision and redundancy, leading to the theme of Clarity, Overlaps, and Measurability. Certain EPAs struggled to achieve top-level support if panelists viewed them as too broad, redundant, or difficult to measure. The reluctance to endorse these EPAs in their current form was attributed to concerns about specificity and practical assessment. *Give or Receive a Patient Handover to Transition Care Responsibility* exemplified this issue, with qualitative feedback resulting in merging this EPA with *Facilitate the Transfer of Patient Care Between Providers and Across Various Clinical Settings, Ensuring Continuity and Safety* to avoid duplicative language.

Another participant's comment, "This EPA is too broad and not necessarily a separately defined or assessable behavior," illustrates the general hesitation to endorse statements that lack specificity. For instance, a respondent struggled defining biomedical knowledge and suggested that integrating this concept into broader EPAs might yield clearer, more assessable activities.

Building on the need for specificity, participants also pointed to the Ethical and Professional Imperatives theme to explain why some EPAs remained below the 75% Strongly Agree threshold despite widespread acknowledgment of their importance. For example, obtaining informed consent earned 57.14% Strongly Agree, while the EPA about ethical dilemmas reached 62.07%. Participants firmly asserted that these tasks are required, with one respondent labeling informed consent as "a foundational element of ethical clinical practice... also a legal requirement." Another described ethical dilemmas as inherently difficult, noting, "Even seasoned clinicians need a team approach." While these skills did not achieve the highest level of consensus on the Strongly Agree scale, the level of overall support when combining Agree and Strongly Agree ratings highlighted their continued relevance.

Based on these findings, no data indicated a need to revise the EPAs prior to the third and final round. As such, the only change in statements was the previously noted elimination of *Give or Receive a Patient Handover to Transition Care Responsibility* in favor of the more comprehensive *Facilitate the Transfer of Patient Care Between Providers and Across Various Clinical Settings, Ensuring Continuity and Safety*. All remaining EPAs continued to be surveyed, as they had not yet met the stopping criteria.

Round 3

By the third and final round of the Delphi process, one additional EPA met the 75% consensus threshold. The EPA that achieved consensus in Round 3 was to *Form Clinical Questions and Retrieve Evidence to Advance Patient Care (75%)* (see Table 25 for Likert scoring and Table 26 for measures of central tendency). This brought the total number of consensus-approved EPAs meeting the criterion at the strong agreement level to 12.

Table 25

Round 3 EPA Inclusion Results

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Total <i>n</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Form clinical questions and retrieve evidence to advance patient care	0	0%	0	0%	0	0%	6	25%	18	75%	24
Recognize a patient requiring urgent or emergent care and initiate evaluation and management	0	0%	0	0%	1	4%	8	32%	16	64%	25
Identify and evaluate ethical dilemmas in patient care, collaborating with multidisciplinary teams to ensure comprehensive and ethically sound decision-making.	0	0%	1	4%	1	4%	9	36%	14	56%	25
Obtain informed consent for tests and/or procedures	0	0%	0	0%	0	0%	9	37.50%	15	53%	24
Demonstrate collaborative care coordination	0	0%	0	0%	1	4%	12	48%	12	48%	25
Critically analyze and apply biomedical knowledge	0	0%	0	0%	4	16.67%	9	37.50%	11	45.83%	24
Facilitate the transfer of patient care between providers and across various clinical settings, ensuring continuity and safety.	0	0%	0	0%	0	0%	15	60%	10	40%	25
Complete accurate medical coding and billing for patient encounters in various clinical settings, using initial feedback to improve practices.	1	4%	1	4%	6	24%	8	32%	9	36%	25
Demonstrate proficiency in performing essential primary care procedures, adapting practices to patient needs and clinical settings.	0	0%	0	0%	2	8%	16	64%	7	28%	25

Note. The table presents Round 3 EPAs, ranked from highest to lowest percentages of Strongly Agree responses. EPAs meeting the 75% inclusion threshold are highlighted with bold percentages. The *n* columns show the number of participants selecting each Likert-scale option, while the % columns display the corresponding percentages. The Total *n* column indicates the overall number of participants who responded to each statement.

Table 26

Round 3 EPA Central Tendency

Entrustable Professional Activity	Mean	Standard Deviation
Form clinical questions and retrieve evidence to advance patient care	4.75	0,44
Recognize a patient requiring urgent or emergent care and initiate evaluation and management	4.60	0.58
Identify and evaluate ethical dilemmas in patient care, collaborating with multidisciplinary teams to ensure comprehensive and ethically sound decision-making.	4.44	0.77
Obtain informed consent for tests and/or procedures	4.63	0.49
Demonstrate collaborative care coordination	4.44	0.58
Critically analyze and apply biomedical knowledge	4.29	0.75
Facilitate the transfer of patient care between providers and across various clinical settings, ensuring continuity and safety.	4.40	0.50
Complete accurate medical coding and billing for patient encounters in various clinical settings, using initial feedback to improve practices.	3.92	1.08
Demonstrate proficiency in performing essential primary care procedures, adapting practices to patient needs and clinical settings.	4.20	0.58

Note. The table presents Round 3 EPAs, the means of the Likert-scale responses are ranked from highest to lowest. EPAs that met the 75% inclusion threshold are highlighted with bold mean scores.

Three additional EPAs reached moderate consensus. The following EPAs achieved between 51% and 74%: 1) *Recognize a Patient Requiring Urgent or Emergent Care and Initiate Evaluation and Management* (64%), 2) *Identify and Evaluate Ethical Dilemmas in Patient Care, Collaborating with Multidisciplinary Teams to Ensure Comprehensive and Ethically Sound Decision-Making* (56%), 3) *Obtain Informed Consent for Tests and/or Procedures* (53%). Notably, these EPAs had a combined Agree and Strongly Agree percentage exceeding 75%.

The following EPAs fell below 50% for Strongly Agree, 1) *Demonstrate Collaborative Care Coordination* (Agree: 48%, Strongly Agree: 48%), 2) *Critically Analyze and Apply Biomedical Knowledge* (Agree: 37.50%, Strongly Agree: 45.83%), 3) *Facilitate the Transfer of Patient Care Between Providers and Across Various Clinical Settings, Ensuring Continuity and Safety* (Agree: 60%, Strongly Agree: 40%,

- 4) *Demonstrate Proficiency in Performing Essential Primary Care Procedures, Adapting Practices to Patient Needs and Clinical Settings* (Agree: 64%, Strongly Agree: 28%) and
- 5) *Complete Accurate Medical Coding and Billing for Patient Encounters in Various Clinical Settings, Using Initial Feedback to Improve Practices* (36%).

Table 27

Round 3 Qualitative Themes

Theme	Definition
Alignment with PA Professional Identity	EPAs that reinforce teamwork, evidence-based practice, patient-centered communications
Clarity of the EPA’s Wording and Scope	The degree to which an EPA’s language is precise, well-defined, and not conflated with multiple distinct skills
Variability in PA Education and Real-World Practice	Concerns arising from inconsistent teaching across PA programs
Realistic Expectation vs. Advanced or Specialized Skill	Whether the skill is truly expected of all new graduates or should be reserved for those in certain specialties

The thematic analysis of expert panel responses in Round 3 developed four themes influencing whether an EPA was considered appropriate for inclusion for newly graduated PAs (see Table 27). The four themes identified were: Alignment with PA Professional Identity, Clarity of the EPA’s Wording and Scope, Variability in PA Education and Real-World Practice, and Realistic Expectation vs. Advanced or Specialized Skill. Below, each theme is described in detail, with representative quotes illustrating panelist perspectives.

The theme Alignment with PA Professional Identity included EPAs that emphasized team-based care, evidence-based practice, and patient-centered communication. Participants referenced the PA profession’s collaborative nature and

commitment to high-quality patient care. As one respondent pointed out, "Practicing EBM is a cornerstone of the profession," underscoring the importance of integrating evidence-based medicine into clinical practice. Another respondent emphasized the collaborative aspect of the PA role by stating, "This reflects working in an interdisciplinary team and is core to practice."

The Clarity of the EPA's Wording and Scope theme was associated with some EPAs that were questioned due to unclear or overly broad wording, which panelists identified as a barrier to inclusion. Some EPAs were seen as ambiguous, conflating multiple skills or lacking specificity in describing expectations for new graduates. One participant expressed frustration with vague phrasing related to *Critically Analyzing and Applying Biomedical Knowledge*, noting, "I am not clear exactly what this question is asking. This is poorly worded." Another respondent questioned the specificity of the biomedical knowledge EPA, stating, "Reading this again, the wording seems off to me." Additionally, the challenge of separating distinct skills of recognizing and implementing plans for emergent care within a single EPA was evident in the following comment: "There are two distinct skills in this proposed EPA. It might need separation." When an EPA was unclear, panelists often recommended revision rather than outright exclusion, highlighting its importance while emphasizing the need for more precise language.

The theme of Variability in PA Education and Real-World Practice highlights the tension between educational and clinical practice contexts. Variability in how (or whether) certain EPAs are taught in PA programs or required in clinical settings influenced its inclusion. Specialty-dependent tasks or administrative responsibilities (e.g., billing and coding) were particularly scrutinized. One respondent observed, "Most

students receive limited exposure during PA school. New PAs should not be expected to be fully competent in this skill." This illustrates how training limitations impact EPA inclusion. Another panelist remarked on the standardization challenge, stating, "Skill and experience at the time of graduation varies quite a bit, despite our attempts to standardize." These responses highlight the difficulty of developing a universal EPA framework in a profession with wide-ranging clinical environments.

The Realistic Expectation vs. Advanced or Specialized Skill theme reflects the dynamic interplay between what can be accomplished in PA education and the specialized practice areas where a new PA will practice. Participants distinguished between skills that should be expected of all new graduates versus those that were too advanced or specialized. Some EPAs were flagged as unrealistic for entry-level PAs, requiring additional clinical experience or post-graduate training. One panelist cautioned, "to the extent that PAs are asked to do this there is often on-the-job training. " Another noted, "In specialty fields, the PA may require more guidance and CME training," reinforcing concerns that not all skills are universally applicable upon graduation. The challenge of defining broad EPAs was further articulated by a participant who stated, "I struggle with this one, as it will be greatly specialty dependent."

EPAs Selected Through Delphi Consensus

Table 28 presents the EPAs that reached consensus across three rounds of the Delphi study. A total of 10 EPAs achieved consensus in Round 1, followed by one in Round 2 and one in Round 3. The consensus percentages ranged from 75% to 89.29%. These results represent the prioritized set of EPAs identified by expert participants as appropriate for entry-level Physician Associate practice at the time of graduation.

Table 28*EPAs Selected Through Delphi Consensus*

EPAs	Consensus Percentage
Round 1	
Prioritizing a Differential Diagnosis Following a Clinical Encounter	88.57%
Documenting a Clinical Encounter in the Patient Record	88.57%
Gathering a History and Performing a Physical Examination	88.24%
Providing Preventive Healthcare Services and Education	88.24%
Recommending and Interpreting Common Diagnostic and Screening Tests	82.35%
Conducting Culturally Competent Patient Interviews and Assessments	76.47%
Providing an Oral Presentation of a Clinical Encounter	82.86%
Developing and Implementing Patient Management Plans	77.14%
Entering and Discussing Orders and Prescriptions	76.47%
Facilitating Relationship Building Through Communication	75.76%
Round 2	
Continuously Improve Clinical Practice Through Reflective Learning, Independently Integrating Feedback to Support Lifelong Professional Development	89.29%
Round 3	
Form Clinical Questions and Retrieve Evidence to Advance Patient Care	75%

Summary

This modified mixed methods Delphi study employed a three-round process to achieve consensus among 35 expert PA educators who are also active clinicians, aiming to develop EPAs for entry-level PAs. All participants were invited to participate in each round. The response rates were 100%, 86%, and 74% for Rounds 1, 2, and 3, respectively.

The survey process began with 21 proposed EPAs, of which 10 achieved the pre-established 75% threshold in the first round. Based on participant feedback, five EPAs were revised for clarity before inclusion in the next round. During Round 2, one more

EPA reached the 75% consensus threshold, followed by another in Round 3, bringing the total to 12 EPAs meeting the inclusion criterion.

In addition to the 12 EPAs that met the consensus threshold, seven EPAs demonstrated combined agreement (Agree and Strongly Agree) exceeding 75%, suggesting their potential relevance to PA practice. One EPA addressing patient handovers was removed due to redundancy with a more comprehensive EPA addressing care transitions. Another EPA, related to coding and billing, did not meet inclusion criteria, with a combined agreement of 68%.

The results of the Delphi process identified 12 EPAs that met the consensus threshold and seven EPAs with high levels of combined agreement (of Strongly Agree and Agree). These findings reflect a structured and iterative process of refinement, ensuring the proposed EPAs align with the needs and expectations for entry-level PA practice. The results provide a comprehensive EPA framework of activities considered critical for inclusion for new PA graduates.

CHAPTER 5: DISCUSSION

Introduction

This study aimed to establish a consensus on the EPAs newly graduated PAs should be expected to perform. These EPAs function as assessment tools, offering a structured framework to enhance the transparency and measurability of PA competencies. By clearly defining these key activities, the study provides educational targets for PA educators, supporting curriculum development and competency-based education. Additionally, these EPAs set baseline expectations for employers, ensuring new PAs enter the workforce prepared to practice effectively across diverse clinical settings.

Twenty-one proposed EPAs for the modified mixed methods Delphi study were derived from a combination of sources, including a literature review, suggestions provided by participants in the pilot study, and EPAs that I created to fill gaps related to the Competencies for the PA Profession. Based on participant feedback during the survey rounds, five EPAs were revised, and two proposed EPAs were combined into one EPA. The study resulted in 12 EPAs that participants believed should be included in the competency-based assessment framework for newly graduated PAs.

This discussion provides a structured analysis of the 12 EPAs identified as meeting expert consensus through this study, including highlights of shared concepts across EPAs, its alignment with the Competencies for the PA Profession, and its adherence to the Accreditation Standards for Physician Assistant Education (ARC-PA). The Competencies for the PA Profession serve as a benchmark aligning the EPAs with widely accepted professional standards developed through collaborative efforts among PA professional organizations. Similarly, the ARC-PA standards ensure alignment with

the foundational requirements of primary PA education. Finally, each EPA is examined in the context of the existing literature to situate the findings within the broader discourse of health professions education and professional practice. This comprehensive approach ensures a nuanced discussion integrating expert consensus, professional competencies, accreditation standards, and relevant scholarly work.

Interpretation of the Findings

Based on expert participant opinions, a total of 12 EPAs achieved the 75% consensus and were identified as the EPAs entry-level PAs should be able to perform at graduation. Ten of the 12 EPAs reached consensus during the first round. This early agreement highlights alignment among participants regarding these foundational clinical tasks expected of newly graduated PAs. This discussion section focuses on synthesizing cross-cutting ideas from these EPAs, such as communication, reflective learning, and cultural competence.

A key finding from this study is that all the selected EPAs align with one or more of the seven Competencies for the PA Profession: Knowledge for Practice, Interpersonal and Communication Skills, Person-centered Care, Interprofessional Collaboration, Professionalism and Ethics, Practice-based Learning and Quality Improvement, and Society and Population Health (see Table 29). This alignment underscores the rigorous nature of the Delphi process, which involved three iterative feedback rounds to develop consensus among a panel of 35 expert educators and clinicians. The finding that the Delphi experts favored EPAs which reflected the Competencies for the PA profession reinforces the validity of both frameworks. While participants were aware that the EPAs were aligned with the competencies, the specific details of this alignment were not

disclosed to them. Moreover, participants were not explicitly asked how they believed the EPAs reflected the competencies. The consensus formed by expert educators and clinicians for EPAs that comprehensively encompasses the competency framework underscores the continued relevance and applicability of the Competencies for the PA Profession.

Table 29

PA Competency Domain Alignment with Consensus-Based EPAs

EPA	Knowledge for Practice	Interpersonal & Communication Skills	Person-centered Care	Interprofessional Collaboration	Professionalism & Ethics	Practice-based Learning & QI	Society & Population Health
Prioritizing a Differential Diagnosis Following a Clinical Encounter	✓		✓				
Documenting a Clinical Encounter in the Patient Record		✓			✓		
Gathering a History and Performing a Physical Examination	✓		✓				
Providing Preventive Healthcare Services and Education			✓				✓
Recommending and Interpreting Common Diagnostic and Screening Tests	✓					✓	
Conducting Culturally Competent Patient Interviews and Assessments		✓	✓		✓		
Providing an Oral Presentation of a Clinical Encounter		✓		✓			
Developing and Implementing Patient Management Plans	✓		✓				
Entering and Discussing Orders and Prescriptions	✓				✓		
Facilitating Relationship Building Through Communication		✓		✓	✓		
Continuously Improve Clinical Practice Through Reflective Learning					✓	✓	
Form Clinical Questions and Retrieve Evidence to Advance Patient Care	✓					✓	

EPAs Meeting Inclusion Threshold (75% or Greater Agreement)

This study's inclusion criteria required 75% or greater agreement on any single Likert scale anchor. Notably, when participants reached a consensus, it was at the Strongly Agree level, demonstrating strong expert agreement on key EPAs. Early consensus was achieved in Round 1 for several EPAs, indicating broad agreement among experts from the outset.

In the first round, participants strongly agreed on multiple EPAs that reflect foundational clinical skills for newly graduated PAs. Among these, *Prioritize a Differential Diagnosis Following a Clinical Encounter* and *Documenting a Clinical Encounter in the Patient Record* each received 88.57% strong agreement, highlighting the importance of clinical reasoning and accurate medical documentation. Similarly, *Gather a History and Perform a Physical Examination* and *Provide Preventative Healthcare Services and Education* reached 88.24% agreement, reinforcing the necessity of comprehensive patient assessment and preventive care in PA practice. Other EPAs achieving early consensus included *Provide an Oral Presentation of a Clinical Encounter* (83%), *Recommend and Interpret Common Diagnostic and Screening Tests* (82.35%), *Develop and Implement Patient Management Plans* (77.14%), *Conduct Culturally Competent Patient Interviews and Assessments* (76.47%), and *Facilitate Relationship Building Through Communication* (75.76%). These findings suggest that expert participants widely recognized the importance of these tasks as fundamental elements of PA education and practice.

As the study progressed into Round 2, additional agreement emerged for *Continuously Improve Clinical Practice Through Reflective Learning, Independently Integrating Feedback to Support Lifelong Professional Development*, which received 89.29% consensus. This result underscores the value of self-directed learning and the ability to adapt clinical practice based on reflective experiences and external feedback. By Round 3, the EPA to *Form Clinical Questions and Retrieve Evidence to Advance Patient Care* reached a consensus, with 75% of participants strongly agreeing on its necessity. Consensus on this EPA in a later round despite not undergoing revision may have been a result of participant interaction through access to quantitative and qualitative data between rounds. The finding that fewer EPAs met the consensus threshold in later rounds suggests that the most clearly communicated activities were identified early, while later rounds refined and clarified areas requiring further discussion.

These findings align with key frameworks defining PA training and practice expectations. The ARC-PA Fifth Edition Standards establish mandated curriculum areas for accredited PA programs (Accreditation Review Commission on Education for the Physician Assistant, 2024). Likewise, the Competencies for the PA Profession, collaboratively developed by the AAPA, ARC-PA, PAEA, and NCCPA, outline fundamental PA practice domains such as Knowledge for Practice, Interpersonal and Communication Skills, Person-Centered Care, Interprofessional Collaboration, Professionalism and Ethics, Practice-Based Learning and Quality Improvement, and Society and Population Health (American Academy of Physician Associates, 2020). The strong consensus on EPAs related to history-taking, differential diagnosis formation, documentation, and patient education aligns with these competency

domains. Additionally, the concepts of culturally competent interviewing and reflective learning suggest an increasing emphasis on patient-centered care and professional development within PA education and practice.

Beyond competency frameworks, these findings also align with broader trends in health professions education, particularly the movement toward competency-based medical education (CBME). By confirming expert agreement on these EPAs, this study provides an evidence-based foundation for integrating them into PA training and assessment strategies. These EPAs can inform curriculum design by ensuring PA programs emphasize core skills that align with expert expectations. Additionally, they offer a structured framework for competency-based assessments that evaluate graduates' readiness for clinical practice.

With these findings establishing a consensus on essential EPAs, the following discussion examines how these activities fit within the broader landscape of PA education and practice. The analysis considers similar EPA research to place the EPAs for newly graduated PAs in context. When specific EPA research is unavailable, relevant studies contextualizing the activity within health professions education are reviewed. Through this analysis, I have contextualized these EPAs within current educational and workforce demands, evaluating their relevance in preparing the next generation of PAs.

Establishing Core Clinical Skills

Based on the findings of this study, the EPA to *Document a Clinical Encounter in the Patient Record* met consensus. Documentation enables accurate communication across the healthcare team and ensures patient care continuity. Including documentation in this framework is consistent with PA accreditation standards, which require programs

to instruct students on clinical documentation (Standard B2.14b) (Accreditation Review Commission on Education for the Physician Assistant, 2024). This activity supports other clinical tasks such as care planning, decision-making, and interprofessional collaboration. Furthermore, the Competencies for the PA profession highlight that this task supports communicating “medical information for clinical, legal, quality, and financial purposes” (American Academy of Physician Associates, 2020, page 3). This reflects the essential role of clinical documentation as a fundamental skill for new PAs.

The significance of clinical documentation as a core competency for PAs is reinforced by evidence demonstrating a link between proficiency in history and physical documentation and overall academic and clinical performance. Lolar et al. (2020) investigated the correlation between PA students’ documentation performance and key educational outcomes, emphasizing its predictive value for academic and professional success. PA students who excelled in clinical documentation consistently achieved higher grade point averages (GPA) in both the didactic ($r = 0.512, p < 0.001$) and clinical ($r = 0.425, p < 0.001$) phases of their education (Lolar et al., 2020). Additionally, a moderate positive correlation ($r = 0.448, p < 0.001$) was identified between documentation scores and Physician Assistant National Certifying Exam (PANCE) performance, with documentation proficiency accounting for 20% of the variance in PANCE scores (Lolar et al., 2020). These results suggest that strong documentation skills are a key indicator of overall success in PA education and certification. These findings align with this Delphi study's EPA framework, further supporting the inclusion of documentation as an EPA for new PA graduates.

The EPA to *Gather a History and Perform a Physical Examination* underscores the essential clinical skills expected of new PAs, with consensus reflecting how this task is a cornerstone of patient care and a critical indicator of competence. Accreditation standards reinforce this by requiring programs to comprehensively teach these skills (Standard B4.03a) (Accreditation Review Commission on Education for the Physician Assistant, 2024). Taking a medical history and performing a physical exam is also included in the AAMC and AACOM EPA frameworks, reflecting its value in medical education.

Evidence from a single-center PA program study that evaluated cognitive and non-cognitive factors in 46 students over three years found a significant link between poor physical exam test performance and program attrition (Telford et al., 2002). The authors concluded that mastering physical exam skills requires advanced cognitive integration, exceeding the demands of multiple-choice exams. The cognitive and practical demands of history and physical examination highlight its role as an effective EPA.

The EPA to *Provide an Oral Presentation of a Clinical Encounter* received high agreement among participants regarding its inclusion as an EPA. Oral presentations are not explicitly mentioned in the PA competencies or referenced in PA program accreditation standards. However, participants in this study emphasized that oral presentations are fundamental for effective clinical communication. The findings align with a viewpoint article in the *Journal of the American Medical Association* noted that oral presentations provide a unique opportunity to assess a learner's knowledge, reasoning, and judgment, making them essential components of clinical education

(Melvin & Cavalcanti, 2016). This perspective reinforces the inclusion of this EPA in both the AAMC and AACOM frameworks.

Developing Critical Thinking with Reflective Practice

The EPA to *Continuously Improve Clinical Practice Through Reflective Learning, Independently Integrating Feedback to Support Lifelong Professional Development* met consensus in this study. Reflective learning is a dynamic process that equips PAs to analyze complex clinical situations, derive lessons from their experiences, and enhance their decision-making skills. By engaging in reflective practice, new PAs can critically evaluate their actions, integrate feedback, and continuously improve their clinical performance.

Previous research supports integrating reflective practice into clinical training. A systematic review of 29 studies identified clinical practice reflection as a mechanism for interpreting complex situations and addressing challenging clinical problems (Mann et al., 2009). This aligns with the needs of new PAs, who benefit from reflective learning as they transition to autonomous practice. This study suggests that reflective practice should be integrated into PA education to develop this targeted EPA.

Developing Interconnected Clinical Skills

The EPAs to *Recommend and Interpret Common Diagnostic and Screening Tests, Prioritize a Differential Diagnosis Following a Clinical Encounter, and Develop and Implement Patient Management Plans* represent a continuum of essential clinical reasoning and decision-making skills for newly graduated PAs. These tasks are deeply interconnected, as the ability to recommend and interpret diagnostic tests directly informs the prioritization of differential diagnoses, which in turn guides the development and

implementation of effective patient management plans. Together, these EPAs illustrate the iterative nature of clinical practice, where diagnostic reasoning, hypothesis generation, and treatment planning converge to ensure safe, evidence-based, and patient-centered care.

The EPA to *Recommend and Interpret Common Diagnostic and Screening Tests* was identified as an expected activity for entry-level PA graduates. This EPA is also represented in the AAMC and AACOM EPA frameworks, highlighting its relevance across healthcare professions. This EPA aligns with ARC-PA standard B2.07d, which mandates instruction on "ordering and interpreting diagnostic studies" (Accreditation Review Commission on Education for the Physician Assistant, 2024, p. 14). It also supports key PA competencies such as Medical Knowledge, Interpersonal and Communication Skills, Person-centered Care, and Society and Population Health, emphasizing its foundational role in clinical decision-making.

Assessing a new PA's ability to recommend and interpret diagnostic studies provides insight into a PA's diagnostic reasoning, which Olson and Graber (2020) identify in their commentary on the topic as a cornerstone of clinical practice. However, formal education in this area is often fragmented and inconsistently grounded in evidence-based principles (Olson & Graber, 2020). Integrating this EPA into PA education addresses these gaps by emphasizing structured, theory-driven approaches that foster critical thinking and reflective practice. This builds on previous commentary on the importance of understanding cognitive biases and system-level factors to enhance diagnostic accuracy and reduce errors (Graber et al., 2018). These perspectives align with the National Academies' report *Improving Diagnosis in Health Care*, which calls for

enhanced diagnostic training to improve patient safety (National Academies of Sciences, Engineering, and Medicine, 2015). In practice, this EPA enables workplace-based assessments that build diagnostic competencies in real-world settings. This EPA's inclusion aligns with broader efforts to improve patient outcomes and underscores the essential role of recommending and interpreting diagnostic and screening tests in healthcare education and delivery.

The EPA to *Prioritize a Differential Diagnosis Following a Clinical Encounter* aligns directly with the established AAMC and AACOM medical education EPA frameworks. This assessment also demonstrates compliance with ARC-PA standard B2.07c, which mandates curricular instruction in generating differential diagnoses across all age groups and clinical contexts. The emphasis on prioritization within the EPA ensures that newly graduated PAs are prepared to navigate complex clinical scenarios, enhancing their ability to make informed diagnostic and management decisions. By integrating this EPA into PA education, programs can better provide evidence for accreditation standards while building core skills for patient care.

Although this EPA is included in AAMC, AACOM, and this study - each informed by expert opinions - specific HPE scholarship evaluating its use as an assessment is lacking. While there is existing research highlighting effective teaching strategies for developing differential diagnoses, including structured reflection and illness script development (Xu et al., 2021) the educational impact of this EPA as an assessment metric remains unexplored. This gap underscores the need for targeted research to assess its implementation and contribution to preparing learners for practice.

The EPA to *Develop and Implement Patient Management Plans* aligns with the Competencies for the PA Profession, specifically the requirement to develop, implement, and monitor the effectiveness of patient management plans (Competency 3.4). This EPA was first published by Lohenry et al. (2017) as part of the PAEA Presidents Commission, which formed the EPA based on a previous PA competency framework. Furthermore, PA accreditation standards reinforce the importance of this EPA. Standard B2.07e mandates that the PA curriculum includes instruction in patient evaluation, diagnosis, and management across all age groups and phases of care, explicitly emphasizing the development and execution of acute and chronic care plans. Together, these frameworks highlight the centrality of this EPA in preparing PAs to deliver patient care.

The EPA to *Develop and Implement Patient Management Plans* was first published by Lohenry et al. (2017), with subsequent literature on the topic limited to a single paper in the PA education field (Acker et al., 2021). In implementing the EPA, Acker and colleagues (2021) describe how the Mayo Clinic PA program incorporated this EPA into their curriculum to ensure that graduates are prepared to transition into clinical practice. The program identified key elements of this EPA. These include integrating pharmacologic and non-pharmacologic treatment options and communicating management plans with patients and healthcare teams. Additional elements encompass consideration of patient-specific factors such as age, psychosocial needs, and economic resources, ensuring patient safety by recognizing and avoiding errors, and conducting conversations about advance directives and goals of care (Acker et al., 2021). The list is completed by utilizing healthcare system resources effectively and making appropriate referrals. These functions were scaffolded across the curriculum, with foundational skills

introduced during didactic training and progressively evaluated through clinical rotations. Detailed rubrics enabled faculty to assess learners on observable behaviors, such as their ability to recommend evidence-based non-pharmacologic treatments and provide targeted feedback to bridge gaps in competence (Acker et al., 2021). This systematic approach, planned during the PA program's curriculum development phase, aimed to ensure that PA students achieve entrustment for this EPA.

Proactive Patient Care Skills

Preventive care and evidence-based medicine (EBM) are interconnected as foundational clinical tasks focusing on proactive, patient-centered approaches. Preventive care emphasizes anticipating and addressing health issues before they become critical, while EBM, reflected in the EPA to *Form Clinical Questions and Retrieve Evidence to Advance Patient Care*, ensures that proposed interventions are grounded in the best available evidence. Participants expect new PAs to integrate preventive care strategies in their provision of clinical care. Preventive care relies on evidence-based protocols, such as vaccination schedules informed by clinical trials, demonstrating the practical integration of EBM into proactive patient care. Similarly, EBM is recognized as a dynamic skill that complements preventive care by requiring continuous engagement with evolving research and guidelines. Together, preventive care and EBM highlight a developmental trajectory where new PAs learn to synthesize evidence and apply proactive strategies to deliver patient-centered care.

Consensus for the EPA to *Form Clinical Questions and Retrieve Evidence to Advance Patient Care* was reached in Round 3 without revision. Despite initial variability, participants increasingly endorsed its inclusion, with the percentage of

Strongly Agree responses rising from 60% to 75%, and the mean score increasing from 4.43 to 4.75. Simultaneously, the standard deviation decreased from 0.88 to 0.44, reflecting a narrowing range of opinion. This progression suggests that participants required time and discussion to fully recognize the EPA's relevance and applicability, rather than changes to the statement itself.

The EPA to *Provide Preventive Health Care Services and Education* demonstrates a critical aspect of PA practice, aligning with essential competencies and accreditation standards. The EPA, introduced for PAs by Lohenry et al. (2017), underscores the vital contributions of PAs to preventive healthcare services and education. The importance of preventive health care services is underscored by ARC-PA standards, which require PA curricula to include instruction in providing preventive patient encounters (B2.08b) and understanding disease prevention concepts (B2.15a). These standards emphasize the role of PAs in public health initiatives, such as violence prevention (B2.11g), and mandate that students receive supervised clinical practice experiences in preventive patient encounters (B3.03a). Furthermore, the Competencies for the PA Profession reinforce the expectation that PAs provide preventive services in the context of epidemiologic applications (Competency 1.3) and for families and communities (Competency 3.8). Integrating this EPA into educational frameworks ensures alignment with ARC-PA standards for prevention care and aims to improve patient and community health outcomes.

The EPA to *Form Clinical Questions and Retrieve Evidence to Advance Patient Care* aligns with frameworks from the AAMC and AACOM. It also supports the Competencies for the PA Profession, particularly in applying clinical sciences to

diagnose disease (Competency 1.5) and interpreting data to inform diagnostic and therapeutic decisions (Competency 3.3). These competencies underscore the importance of integrating patient information, scientific evidence, and clinical judgment to advance patient care through evidence-based practice. Furthermore, the building blocks for this EPA are mandated by an ARC-PA standard (B2.13), which requires curricular preparation for PA students in formulating research questions, interpreting biostatistics, recognizing the limits of medical research, understanding sampling methods, and utilizing medical literature databases. Together, the sections of this standard ensure PAs develop the necessary skills for evidence-based decision making.

The EPA to *Form Clinical Questions and Retrieve Evidence to Advance Patient Care* met the inclusion criteria Round 3 without revision for PAs in this Delphi study. However, ongoing debate about its entrustability for physicians, given its inclusion in both the AAMC and AACOM EPA frameworks, highlights the challenge of defining EPAs that maintain both specificity and alignment with broader educational objectives. Meyer et al. (2020) asked 10 EPA experts to identify EPAs within the AAMC framework needing revision. They concluded that this EPA does not qualify as a discrete, observable task and fails to meet the criteria for entrustability, defined as tasks that are independently executable, critical to patient care, and measurable in terms of performance outcomes (Meyer et al., 2020). Meyer et al. (2020) emphasize the need for EPAs to focus on clearly defined, assessable activities to support competency-based medical education.

Brown (2021), however, challenges this perspective in a letter to the editor of *Academic Medicine*, arguing that this EPA and others capture a fundamental aspect of clinical practice - evidence-based decision making - that cannot be reduced to narrowly

defined technical tasks. He contends that focusing on technical specificity undermines the holistic preparation of learners and risks excluding essential integrative processes like forming clinical questions and retrieving evidence (Brown, 2021). Brown highlights that readiness gaps among new graduates will not be addressed by fragmenting medicine into isolated observable tasks. Instead, he advocates for retaining the broader framing of the EPA to reflect its critical role in preparing graduates for the complexities of clinical practice.

In response, Meyer et al. (2021) maintain that while evidence retrieval is an important competency, it is not an entrustable task in isolation (Brown, 2021). They assert that conflating competencies with EPAs undermines the purpose of the entrustment framework. Meyer et al. (2021) propose that in future revisions, the EPA could be nested within other EPAs or reframed to emphasize observable and discrete activities that can be assessed reliably. This approach, they argue, ensures that EPAs remain actionable and linked to entrustment decisions while retaining their educational value. This dialogue highlights the complexity of defining EPAs that align with competency-based frameworks.

The inclusion of the EPA to *Form Clinical Questions and Retrieve Evidence to Advance Patient Care* that exists within the AAMC and AACOM frameworks and its consensus score in this study reflects the perceived importance of this activity by the various expert consensus groups. While debates like those highlighted by Meyer et al. (2021) and Brown (2021) underscore the challenges of balancing specificity and educational breadth in defining EPAs, the dynamic nature of clinical practice necessitates a nuanced approach. Meyer and colleagues (2021) call for ongoing refinement of EPAs

and Brown's (2021) emphasis on their holistic role both point to the need for PA education to critically evaluate how this EPA is integrated into curricula. By recognizing that evidence-based decision making is not a static competency but rather an evolving and context-dependent process, PA educators can ensure that this EPA effectively prepares graduates to navigate the complexities of modern healthcare while maintaining its educational and clinical relevance.

Enhancing Communication and Cultural Awareness

The EPA to *Facilitate Relationship Building through Communication* exemplifies a core skill for the PA profession. This EPA emphasizes fostering therapeutic relationships, navigating challenging conversations with sensitivity, and overcoming communication barriers to build trust and collaboration. Similarly, the EPA to *Conduct Culturally Competent Patient Interviews and Assessments* integrates principles of cultural humility, aligning with professional competencies and accreditation standards. Together, these EPAs that were developed for this study address critical gaps in structured approaches to evaluating communication and relational competencies in PA education, equipping graduates with the skills to provide equitable, patient-centered care.

The EPA to *Facilitate Relationship Building through Communication* demonstrates ideals that are deeply held within the PA profession as evidenced by the extensive reference to the concepts in key PA professional frameworks. The Competencies for the PA Profession recognize that effective communication is an essential competency for PAs. This EPA aligns with the goal of "demonstrating interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals." It

emphasizes establishing therapeutic relationships (Competency 2.1) to address patients' values and goals, navigating challenging conversations with sensitivity (Competency 2.5), and overcoming communication barriers (Competency 2.8) to foster trust and collaboration.

This EPA aligns with the ARC-PA standards B2.04 and B2.17e, which emphasize the necessity for PA programs to provide robust instruction in interpersonal and communication skills. Standard B2.04 requires that PA curricula include content designed to enhance the effective exchange of information and collaboration among patients, families, and healthcare professionals. Similarly, Standard B2.17e highlights the importance of instruction regarding the professional relationships PAs develop with physicians and other healthcare team members. These standards emphasize the need for PAs to excel in communication, which is vital for patient safety, continuity of care, and effective teamwork. This EPA directly supports these instructional standards, reinforcing the role of communication in PA education and ensuring that graduates are well-equipped to meet these demands.

Building on this newly developed EPA, the broader health professions literature provides valuable context to understand its impact and potential application. This EPA directly addresses gaps in structured approaches to evaluating relational and communicative competencies in PA practice. Relationship building and communication have long been recognized as foundational elements in healthcare, integral to both patient outcomes and team-based care.

Denniston et al. (2017) conducted a systematic literature review that synthesized 205 learning outcomes for communication skills across health professions. Their analysis

identified four key domains of learning outcomes for communication skills: 1) Knowledge as the understanding of the principles of effective communication, 2) Content as what is communicated in an interaction, 3) Process as how communication occurs, and 4) Perceptual as self-awareness and the ability to interpret others' perspectives (Denniston et al., 2017). These domains highlight the multidimensional nature of communication and underscore the necessity of structured educational strategies to ensure effective, patient-centered communication in clinical practice. The EPA to *Facilitate Relationship Building through Communication* provides educators with a tool for assessing the complex components of communication through workplace-based assessments.

Dang et al. (2017) conducted a longitudinal qualitative study exploring trust-building in new patient-provider relationships at an HIV clinic. They identified key strategies such as providing reassurance, encouraging questions, and fostering shared decision-making - all of which align closely with the goals of this EPA (Dang et al., 2017). This study illustrated how establishing patient rapport can mitigate patient anxiety, enhance engagement, and improve retention in care, particularly among vulnerable populations. These findings emphasize the role of relationship building in reducing patient anxiety and improving care engagement. The combined insights from Denniston et al. (2017) and Dang et al. (2017) provide a foundation for this newly developed EPA, emphasizing relationship-building and communication as a unified concept.

The EPA to *Conduct Culturally Competent Patient Interviews and Assessments* was valued by study participants and aligns with professional and educational standards. The Competencies for the PA Profession further reinforce the importance of cultural humility in professional practice. Specifically, Competency 5.5 under Professionalism

and Ethics states that PAs must “demonstrate cultural humility and responsiveness to diverse patient populations, including diversity in sex, gender identity, sexual orientation, age, culture, race, ethnicity, socioeconomic status, religion, and abilities.”

This EPA’s inclusion is further substantiated by alignment with the ARC-PA Standard A1.11, which mandates that PA programs actively promote diversity, equity, and inclusion (DEI). The standard explicitly requires programs to document action plans for DEI, implement recruitment and retention strategies, and allocate resources to support these efforts. Embedding cultural competence into clinical education through EPAs demonstrates individual skills and institutional commitments to DEI, creating a dual-layered approach to ensuring culturally competent care.

Liu et al. (2021) developed a multi-level framework that provides theory-based guidance to achieve cultural competence at the individual, team, and organizational levels. Their critical interpretive synthesis (CIS) evaluated 69 studies on cultural competence development in health professions education (Liu et al., 2021). CIS is a systematic review method that combines qualitative and quantitative research to develop theory (Depraetere et al., 2021). Liu and colleagues (2021) identified affective, cognitive, and behavioral domains as key to individual development, which includes openness to cultural differences, cultural knowledge, and the practical application of culturally sensitive behaviors. Team-level competence focuses on fostering interprofessional collaboration and shared cultural norms, while organizational competence requires leadership commitment, inclusive policies, and culturally informed practices. This framework underscores the importance of embedding this EPA into clinical education to assess individual development. It also demonstrates an aspect of the organizational-level

commitment necessary to meet accreditation standards mandating compliance with DEI directives.

EPAs with Moderate Consensus (51 – 74% Agreement)

EPAs that received between 51% and 74% approval were classified as having moderate expert consensus. While these activities did not reach the highest threshold for approval in this study, they remain important, as more than half of the experts strongly agreed that they should be included in this EPA framework. Although not part of the formal consensus criteria, it is noteworthy that each of these EPAs received a combined Agree and Strongly Agree alignment ranging from 92% to 100%. Their failure to reach the 75% consensus threshold meant they all continued to be discussed in Round 3. These EPAs include *Recognize a Patient Requiring Urgent or Emergent Care* (64%), *Obtain Informed Consent for Tests and/or Procedures* (62.5%), *Demonstrate Proficiency in Performing Primary Care Procedures, Adapting Practice to Patient Needs and Clinical Settings* (64%), *Facilitate the Transfer of Patient Care Between Providers and Across Various Clinical Settings, Ensuring Continuity and Safety* (60%), and *Identify and Evaluate Ethical Dilemmas in Patient Care, Collaborating with Multidisciplinary Teams to Ensure Comprehensive and Ethically Sound Decision Making* (56%).

High-Stakes Skills

The EPA to *Recognize a Patient Requiring Urgent or Emergent Care and Initiate Evaluation and Management*, is a component of high-stakes tasks. It is grounded in the Competencies for the PA Profession, particularly Competency 1.4, which emphasizes the ability to "discern among acute, chronic, and emergent disease states." This competency reflects the diagnostic and management skills required to ensure patient safety and

optimize outcomes in high-stakes scenarios. The proposed EPA aligns with the ARC-PA Standard B2.08b, which requires curricular instruction in emergent patient encounters, while Standards B3.03a and B3.04a emphasize supervised clinical experiences in settings such as emergency departments to prepare students for real-world practice. While this EPA did not meet the 75% consensus threshold for this Delphi study, given the finding that 64% of participants believe it belongs in the framework warrants consideration.

A systematic review by Passoni Lopes et al. (2024) contributes to the conversation about an urgent and emergent care EPA, which aligns with the competency-based expectations for PA training. The study, grounded in the perspective of emergency medicine physicians, highlights that while this EPA was recognized as essential, variability exists in how it is taught and assessed. Simulation-based training was used predominantly to evaluate this EPA (Passoni Lopes et al., 2024). Despite the recognized importance of this concept, students often reported lower self-perceived readiness to manage emergent situations (Passoni Lopes et al., 2024). This discrepancy suggests a need for more structured and standardized EPA frameworks, ensuring that learners not only acquire the necessary skills but also develop the confidence to apply them in clinical settings. According to the authors, their systematic review underscores the lack of emergency medicine-specific EPAs in undergraduate curricula, emphasizing the need for further refinement and integration of progressive entrustment models that better prepare new graduates for the skills required in real-world emergency care (Passoni Lopes et al., 2024). These findings align with PA educational standards, reinforcing the importance of structured didactic and supervised clinical experiences to bridge the gap between theoretical knowledge and practical application in urgent and emergent care scenarios.

Informed consent is not explicitly mentioned in the ARC-PA Fifth Edition accreditation standards, possibly because this EPA may be assumed to be part of procedural performance. While the proposed EPA, *Obtain Informed Consent for Tests and/or Procedures*, applies broadly to all procedures and tests requiring this process, discussions within health professions education have particularly focused on surgical consent due to its high-stakes nature, complexity, and the ethical significance of direct surgeon-patient communication in these scenarios. This may have contributed to the proposed EPA failing to meet the inclusion criterion for this study. A key perspective in this conversation highlights the distinction between procedures performed by a PA and those undertaken as part of a surgical team, where the PA supports the attending surgeon. This topic has been critically examined through relevant case law, including the landmark *Shinal v. Toms* case, which involved a PA supporting an attending surgeon. The Pennsylvania Supreme Court ruled that the duty to obtain informed consent must be performed directly by the treating physician (Fernandez Lynch et al., 2018). Fernandez Lynch et al. (2018) analyzed the implications of this ruling, emphasizing its impact on team-based care and the challenges of delegating informed consent tasks while maintaining physician accountability. Lynch et al. concluded that treating physicians should establish robust structures to support team members in the consent process, ensuring they have the necessary training, expertise, tools, and clarity about expectations. They also emphasized that the treating physician must confirm directly with the patient that consent discussions have been adequate, and all questions addressed before proceeding with the procedure. Their work highlights how state-specific regulations

influence legal expectations for surgical teams and underscores the need for clear, structured guidelines in competency-based frameworks.

White et al. (2024) examined the informed consent EPA within the context of physician surgical residency training, finding that most attending surgeons retained responsibility for obtaining informed consent due to its ethical and relational significance rather than entrusting it to trainees. Their study revealed that entrustment decisions were shaped more by cultural norms and professional expectations than by trainee competency, raising questions about whether this task aligns with the traditional EPA framework (White et al., 2024). Building on their work, Hafferty and Hamstra (2024) provided commentary, framing informed consent as a culturally embedded and identity-defining practice that challenges the standardization of EPAs. They argued that informed consent's role in professional identity formation and the surgeon-patient relationship requires a nuanced approach, emphasizing local adaptation and the hidden curriculum over rigid competency-based frameworks (Hafferty & Hamstra, 2024). Together, these works highlight the complexities of applying universal EPA models to informed consent, particularly in tasks that carry significant ethical and relational weight.

The EPA to *Perform the General Procedures of a PA* was adapted from the EPA to *Perform the General Procedures of a Physician*, initially proposed by the AAMC (2014) and later affirmed by AACOM (2016). Both organizations were vague about the specific procedures encompassed by this EPA, providing only broad examples. For instance, the AAMC suggested procedures such as basic cardiopulmonary resuscitation (CPR), bag and mask ventilation, venipuncture, and inserting an intravenous line (Association of American Medical Colleges, 2014). AACOM added a procedure specific

to osteopathic training: osteopathic manipulative medicine (American Association of Colleges of Osteopathic Medicine, 2016). This lack of specificity likely contributed to participant feedback in this Delphi study that described the EPA as too broad and ambiguous, with comments such as, "I am not sure what general procedures are," and "This is a difficult question because it is so vague - what is a general procedure?"

To address these concerns, the EPA was revised for Rounds 2 and 3 to *Demonstrate Proficiency in Performing Essential Primary Care Procedures, Adapting Practices to Patient Needs and Clinical Settings*. While the revised language attempted to clarify the scope by focusing on primary care, participants remained divided on their perspectives about inclusion of this EPA. Delphi participants also expressed concerns about the limited applicability of the primary care terminology across non-primary care specialties. These critiques were consistent with the challenge of creating EPAs that balance specificity and adaptability while maintaining relevance across varied clinical and educational contexts. Future iterations of this EPA could simplify the language to *Demonstrate Proficiency in Performing Essential Primary Care Procedures* in response to some participants who highlighted that the clause *Adapting Practices to Patient Needs and Clinical Settings* could be added to every EPA. Additionally, implementation of this EPA may be guided by Hooker and McKenna (2024), who analyzed Medicare Part B claims data from 2021 to identify outpatient procedures that PAs and nurse practitioners should be proficient in upon graduation. Their findings emphasized procedural trends in primary care, particularly in skin, musculoskeletal, and EENT procedures.

Amiel et al. (2021) assessed the feasibility and effectiveness of implementing the Core EPAs within undergraduate medical education. The authors found feasibility

problems with the procedural EPA. Among residency program directors surveyed in 2014, only 24.2% felt confident that first-year residents could perform general procedures without direct supervision during their first week of residency (Amiel et al., 2021). Data from institutions that piloted the AAMC EPAs further confirmed these concerns, as no students were immediately deemed ready for entrustment under indirect supervision by their program (Amiel et al., 2021). Additionally, only 32% of new medical graduates self-reported readiness to perform procedures upon entering residency (Amiel et al., 2021). After a few months of postgraduate training, 69% of residency program directors rated them as prepared (Amiel et al., 2021).

One of the primary barriers to procedural competency was the lack of authentic clinical opportunities for medical students to perform procedures. Amiel et al. (2021) described that in many institutions, students did not engage in enough hands-on procedural experiences, leading to a reliance on simulation-based training rather than real-world applications. While simulation was noted as a valuable educational tool, its role in establishing true entrustment for patient care was questioned due to the absence of real patient interactions (Amiel et al., 2021). These findings suggest that procedural competence may be more appropriately developed in residency training rather than during medical school, particularly for procedures requiring technical skill development and patient safety considerations. For PA education, this discussion highlights the potential to further refine procedural competency assessments to ensure that graduating PAs are proficient and confident in performing procedures within their scope of practice.

The development and implementation of high-stakes EPAs are crucial to ensuring that new PA graduates can deliver safe, effective, and ethical care. While these EPAs

align with established competency frameworks and accreditation standards, this study highlights the need for ongoing refinement to address challenges such as variable practice expectations, resource-intensive assessments, and the complexities of integrating procedural training into real-world practice. This discussion underscores the value of simulation-based assessments and adaptable frameworks in enhancing PA readiness for high-stakes scenarios. Future research and educational innovations will be essential in closing these gaps and equipping PAs to navigate the evolving demands of healthcare with competence and confidence.

Healthcare System Collaboration

Several proposed EPAs under the umbrella of healthcare system collaboration did not meet the 75% consensus inclusion criterion for any single survey round. However, their combined Agree and Strongly Agree (92% - 100%) ratings underscore their importance. This discussion examines their development and refinement, grounded in expert consensus and aligned with accreditation standards.

The development of the EPA to *Identify and Evaluate Ethical Dilemmas in Patient Care, Collaborating with Multidisciplinary Teams to Ensure Comprehensive and Ethically Sound Decision-Making* represents an evolution in defining the expectations for newly graduated PAs addressing ethical challenges. This EPA, created as part of this study, underwent refinement from its original form, *Evaluate Ethical Dilemmas in Patient Care*, to incorporate a broader emphasis on teamwork and interprofessional collaboration.

The original EPA focused on evaluating ethical dilemmas as activities performed by an individual. While this is important, it does not fully capture the interdependent and

team-oriented nature of contemporary clinical practice. The revised EPA broadens the scope by explicitly identifying ethical dilemmas and emphasizing collaboration with multidisciplinary teams. This shift acknowledges that ethical decision-making often transcends the capacity of any single provider, requiring input from diverse perspectives to ensure decisions are comprehensive and patient centered.

The revised EPA integrates principles outlined in the Competencies for the PA Profession, particularly in Interprofessional Collaboration and Professionalism and Ethics, as well as accreditation standards that emphasize communication and ethical practice. Competency 4.1 highlights engagement with other healthcare professionals in a climate of mutual respect, ethical integrity, and trust. The EPA reflects this competency's call for team-based, patient-centered care by incorporating multidisciplinary collaboration. Additionally, the EPA addresses Competencies 5.2 and 5.6, emphasizing compassion, integrity, respect for others, and adherence to ethical principles such as patient autonomy and confidentiality. From an accreditation perspective, the EPA supports the instructional requirements set forth by ARC-PA standard B2.04, which mandates the inclusion of interpersonal and communication skills for effective collaboration, and Standard B2.18, which requires instruction in the principles and practice of medical ethics, are foundational elements that this EPA reinforces.

Although the EPA *Identify and Evaluate Ethical Dilemmas in Patient Care, Collaborating with Multidisciplinary Teams to Ensure Comprehensive and Ethically Sound Decision-Making* aligns with competency and accreditation frameworks and received positive participant feedback, it did not achieve consensus on any single survey response. The qualitative data offers insight into why this may have occurred.

Participants discussed the role of multidisciplinary teams, experienced providers, and institutional support in ethical decision-making. Additionally, concerns were raised about the limited experiential learning opportunities available to PA students in this area. While participant responses were supportive of inclusion, the qualitative findings underscore the complexity of this EPA. This suggests that while addressing dilemmas is a critical skill, it may not be best assessed through an EPA framework. Notably, existing literature has explored ethics education and assessment, highlighting the importance of continued investigation in this area.

The concept of navigating ethical dilemmas aligns with themes in ethics education. Souza and Vaswani's (2020) scoping review highlights various teaching strategies, including case-based learning, videos, role modeling, lectures, and patient interactions. They emphasize that combining these methods is most effective. The review also identifies challenges in assessing ethics education, noting a lack of research on effective evaluation strategies. Most curricula rely on student feedback from unstructured questionnaires and reflections, underscoring the need for more rigorous studies (Souza & Vaswani, 2020).

Andersson and colleagues' (2022) integrative systematic review emphasizes the importance of ethical competence as a composite of sensitivity, knowledge, reflection, decision-making, and behavior. This proposed EPA attempted to build on this by operationalizing these competencies in a team-based clinical context. Their findings also advocate for simulation-based approaches (Andersson et al., 2022). This suggests that simulation could be incorporated into future assessment of the EPA to enhance realism

and provide PAs with opportunities to practice ethical decision-making in controlled yet authentic scenarios.

The Health Professional Ethics Rubric outlined by Carlin et al. (2011) provides a resource for assessing critical thinking and ethical reasoning. The rubric's emphasis on structured evaluation of decision-making and application of interprofessional values informed the EPA's focus on aligning individual reasoning and collaborative ethical decision-making within multidisciplinary teams (Carlin et al., 2011). This suggests that assessments should be structured and reflect clinical practice realities, where decisions are often made in consultation within a multidisciplinary team.

The original EPA, *Give or Receive a Patient Handover to Transition Care Responsibility*, was derived from the AAMC and AACOM EPA frameworks. Another initially surveyed EPA, *Provide Transfer of Care in a Variety of Settings*, originated from the PAEA Presidents Commission EPA developed by Loherty et al. (2017). Delphi participants indicated that these EPAs were conceptually similar and difficult to distinguish from each other. As a result, they were consolidated into a single, more comprehensive EPA: *Facilitate the Transfer of Patient Care Between Providers and Across Various Clinical Settings, Ensuring Continuity and Safety*. This revised EPA, informed by Delphi participant feedback, integrates elements of both patient-focused care transfer and provider-focused handovers while emphasizing continuity and safety as critical components of the transition process. While this proposed EPA fell short of the 75% consensus criterion, it is consistent with the PA competency 3.7 which explicitly calls for PAs to "refer patients appropriately, ensure continuity of care throughout transitions between providers or settings, and follow up on patient progress and

outcomes." The concept of effective patient transitions is also included in the AAMC and AACOM frameworks and the PAEA Presidents Commission work by Loheny et al. (2017).

Notably, the ARC-PA's Fifth Edition Accreditation Standards do not explicitly address care transitions, creating a potential gap in guidance for PA programs. This omission may have contributed to the Delphi participants' perspectives which resulted in failure to reach consensus for this EPA. This omission highlights an opportunity for the ARC-PA commissioners to revise future standards to explicitly include care transition as a curricular component to reflect the PA competencies. Such an update would standardize expectations across programs, ensuring that all PA graduates are prepared to manage this aspect of clinical practice. While the EPA failed to reach the strict 75% consensus threshold for this study, the Delphi participants combined their votes for 100% positive alignment (Agree: 60%, Strongly Agree: 40%). This provides an opportunity to further understand this EPA's context for consideration in future assessment frameworks.

Stalvey et al. (2016) revealed deficiencies in medical and surgical interns' preparedness for written patient handovers. During an Objective Structured Clinical Examination (OSCE), 73% of interns did not meet expectations (Stalvey et al., 2016). Although the interns' medical schools recognized handovers as a core EPA, the findings revealed that many interns overlooked critical elements, including illness severity, anticipatory guidance, and contingency planning (Stalvey et al., 2016). This study underscores the need for targeted educational interventions in undergraduate medical education to address these deficits before transitioning to residency.

Similarly, Posel et al. (2019) investigated the progression of handover EPA scores in trauma simulations. While procedural skills improved significantly at each step, from junior undergraduate to senior undergraduate to postgraduate training ($F_{(2,108)} = 15.402, p < 0.001$, Cohen's $d = 1.12$), professional communication skills did not show comparable gains ($F_{(2,108)} = 1.037, p = 0.36$) (Posel et al., 2019). This persistent gap suggests that current training programs may not sufficiently emphasize the communication aspects of handovers, which are a critical component for effective and safe care transitions.

Deficiencies in written communication and the non-significant improvement of verbal handoff skills among newly graduated physicians highlight critical gaps in essential patient care competencies (Posel et al., 2019; Stalvey et al., 2016). While the EPA did not meet the consensus inclusion criterion for this Delphi study, further development is warranted to ensure competency in this important practice area. The challenges identified in the physician education literature mirror broader trends in clinical practice.

While the revised EPAs did not meet consensus for this study, they reflect the evolving expectations for newly graduated PAs, emphasizing the role of ethical decision-making and care transitions across the healthcare system. Both EPAs were iteratively refined through feedback from Delphi participants, resulting in enhancements that align them more closely with the realities of clinical practice and the complexities of healthcare delivery. This iterative process highlights the value of expert consensus in shaping educational standards and underscores the importance of collaboration in refining competency frameworks. These findings contribute to the health professions education

literature by demonstrating how structured, evidence-informed approaches can address gaps in training, align with professional competencies, and ensure that new PAs are equipped to meet the demands of dynamic clinical environments.

EPAs Below 50% Consensus

Three EPAs did not reach 50% consensus for any single Likert scale anchor by the end of Round 3. Two of these, *Critically Analyze and Apply Biomedical Knowledge* (48.83%) and *Demonstrate Collaborative Care Coordination* (48%), were seen as conceptually challenging to define as observable activities. Despite receiving overall agreement ratings between 86.33% and 92% across combined Agree and Strongly Agree responses, they failed to surpass the 75% threshold, suggesting ongoing concerns about their inclusion in this framework. Meanwhile, *Complete Accurate Medical Coding and Billing for Patient Encounters in Various Clinical Settings, Using Initial Feedback to Improve Practices* (36%) was recognized as an important but complex task that was not readily observable or suited for assessment as an individual EPA.

Operationalizing Contextual Skills

Contextual skills, including care coordination and the application of biomedical knowledge, are critical for navigating the complexities of modern healthcare. These skills enable PAs to apply foundational knowledge in clinical decision-making while effectively collaborating within interprofessional teams. Contextual skills go beyond technical knowledge to encompass adaptability, situational judgment, and the ability to navigate interpersonal dynamics, institutional workflows, and clinical complexities. This expanded perspective underscores the interplay between theoretical understanding and real-world application. These concepts may have been perceived by the Delphi experts as

difficult to observe directly as an EPA. While applying theoretical knowledge in the real world is important, the proposed EPAs did not inspire the 75% consensus criterion required by this Delphi study.

This study introduced two new EPAs to address these challenges and equip PA graduates for the demands of modern healthcare systems. The first, *Demonstrate Collaborative Care Coordination*, highlights the PA's role in bridging gaps within fragmented care systems. The second, *Critically Analyze and Apply Biomedical Knowledge*, focuses on linking theoretical understanding to practical clinical applications.

I introduced the EPA to *Demonstrate Collaborative Care Coordination* to address the difficulty patients face in connecting disparate parts of their care within a complex healthcare system. The proposed EPA, while not meeting consensus, does highlight the role PAs play in bridging gaps to ensure continuity and coordination and is aligned with the Competencies for the PA Profession such as (Competency 4.2), leveraging team expertise to enhance care strategies (Competency 4.3), and making timely referrals to ensure appropriate care (Competency 4.5) and ARC-PA standard B2.04, which requires PA programs to provide instruction in interpersonal and communication skills that enable effective collaboration with patients, families, and other healthcare professionals.

While no existing health professions education studies specifically address the application of an EPA to *Demonstrate Collaborative Care Coordination*, the concept is a well-established concept in the literature, with research highlighting clinician strategies and best practices in high-performing healthcare systems that can help inform the future development of this EPA. Ju (2022) highlights the Care Coordination Model, which

identifies characteristics of effective coordination, including assuming accountability for care transitions, supporting patients, and building collaborative relationships with key providers and discusses how care coordination is a vital workplace skill for clinicians in delivering effective, patient-centered healthcare (Ju, 2022). Simpson et al. (2022) emphasize the critical role of interprofessional team-based care, focusing on how healthcare providers contribute directly to collaborative efforts that enhance patient outcomes by engaging in interprofessional communication, coordinating care plans, and ensuring continuity of care by bridging gaps across specialties (Simpson et al., 2022). The authors also emphasized the importance of aligning organizational structures to support provider engagement in care coordination, underscoring the value of team-based approaches in achieving seamless and effective healthcare delivery.

The proposed EPA to *Critically Analyze and Apply Biomedical Knowledge* reflects elements from the ARC-PA Fifth Edition Standards, (specifically B1.01C) that mandates PA curricula include core medical knowledge about evolving biomedical sciences and B2.02, which requires the inclusion of anatomy, physiology, pathophysiology, pharmacology, and genetics as well as their application to clinical practice) and the Competency for the PA Profession (1.5), which highlights the need to demonstrate evolving biomedical and clinical knowledge and apply it to patient care.

Examining data from the participant comments in this study showcases that while the proposed EPA of *Critically Analyze and Apply Biomedical Knowledge* was often supported as an essential skill, there were concerns related to operationalizing it. Expert PA educators and clinicians described biomedical knowledge as the "bedrock" of PA practice, noting its critical role in clinical decision-making and effective patient care. One

PA educator remarked, "Biomedical knowledge forms the foundation for all clinical decision-making and effective patient care," echoing a medical student's sentiment: "Without the basic science knowledge to guide our practice, we would just blindly follow clinical guidelines" (Dickinson et al., 2020, p. 4). Another PA educator noted that biomedical knowledge differentiates professionals from the public, with one participant stating, "This is what we went to school for and are paid to do. It separates the public from the professionals." However, several of the Delphi participants perceived this proposed EPA as being difficult to assess and saw complexities in bridging the gap between theoretical concepts and practical applications. One PA educator noted: "Critically analyzing and applying biomedical knowledge is a skill that develops over time within a specific specialty." This perspective contributed to the lack of consensus regarding this EPAs inclusion for newly graduated PAs.

While the Delphi participants voiced support for these novel EPA assessments, *Demonstrate Collaborative Care Coordination* and *Critically Analyze and Apply Biomedical Knowledge*, the EPAs did not reach the predetermined consensus threshold for this study. This lack of consensus highlights the need for a different perspective. This could be achieved by developing more precise language if they are to become EPAs in the future.

Administrative Tasks

The proposed EPA, *Complete Accurate Medical Coding and Billing for Patient Encounters in Various Clinical Settings* reflect administrative tasks within the healthcare organization. The ARC-PA standard B2.14a mandates that PA curricula include instruction on the business of healthcare, encompassing billing and coding. This standard

recognizes the role these skills play in ensuring regulatory compliance, optimizing revenue, and supporting organizational sustainability. Additionally, the Competencies for the PA Profession frames billing and coding within the broader domain of Practice-Based Learning and Quality Improvement. For example, Competency 6.6 emphasizes cost-effective resource allocation, which depends on accurate coding to ensure appropriate reimbursement. Competency 6.7 highlights the importance of understanding the financial implications of clinical decisions, while Competency 6.8 underscores the role of precise documentation in capturing and demonstrating the productivity and value of PAs. These standards and competencies highlight the importance of integrating billing and coding education into PA training to align with accreditation requirements and support effective healthcare delivery. While the Delphi participants did not express a consensus for this EPA's inclusion for newly graduated PAs, 68% of participants selected a combined Agree or Strongly Agree rating. Given the alignment of this EPA with accreditation standards and Competencies of the PA Profession, this proposed EPA merits further discussion.

Implications

This study sought to define a set of EPAs for newly graduated PAs using a modified Delphi process. The findings offer insights into PA education, clinical training, CBME, accreditation, and workforce readiness. The results suggest that entrustability is not solely a function of competency attainment but rather a reflection of the interplay between clinical expectations, professional norms, and risk considerations. By achieving expert consensus on 12 EPAs, this study provides a structured, empirically validated framework for guiding PA training and workplace integration, ensuring that newly

graduated PAs enter practice prepared to perform key clinical tasks safely and effectively.

Practical Implications

The findings have practical implications for PA education and curriculum development. The validated EPAs present an opportunity for PA programs to refine their curricula, ensuring that didactic and clinical training emphasizes competency development and the ability to perform essential workplace tasks. These EPAs offer an assessment framework for observable skills, guiding faculty in evaluating student progression toward practice. The strong agreement on EPAs related to differential diagnosis, history-taking, clinical documentation, and patient education underscores the universal nature of these clinical activities across all practice settings. In contrast, EPAs with lower consensus scores, such as medical billing or procedural skills, highlight the extent to which certain tasks remain context-dependent, requiring additional training beyond the point of graduation. By distinguishing between foundational and context-dependent tasks, this study provides a basis for PA programs to ensure their graduates are trusted to perform the essential clinical practice functions.

Beyond curriculum development, the study's findings have direct implications for clinical training and entrustment decisions in practice. Entrustment in early PA practice is shaped by clinical context, patient complexity, and practice expectations. The EPAs validated in this study serve as reference points for preceptors, offering a structured approach for determining what tasks new graduates should be expected to perform. The consensus findings highlight vital activities, with failure to demonstrate proficiency in these areas seen as a barrier to safe clinical practice. At the same time, lower levels of

agreement on certain EPAs suggest that practice expectations remain fluid, influenced by specialty, institutional policies, and individual practitioner experience. While many the tasks received broad support for inclusion, preceptors and educators must recognize that clinical readiness cannot always be standardized across settings. The variability in agreement on certain EPAs reinforces the importance of adaptive clinical training models that allow for flexibility in entrustment decisions based on specific practice environments.

Beyond guiding PA education and training, this study contributes to ongoing discussions regarding accreditation and competency-based assessment. Accreditation standards emphasize the need for structured training in core areas, and these findings support efforts to integrate EPAs to demonstrating compliance with accreditation frameworks. By incorporating EPAs into program evaluations, PA programs may develop more structured approaches for assessing whether graduates meet national standards for entry-level practice. Further, these findings reinforce the need for CBME models that move beyond broad competency statements toward using specific, observable clinical tasks as markers of workplace readiness.

Empirical Implications

From an empirical perspective, this study contributes to the growing body of literature on EPAs and CBME by offering a validated set of tasks that reflect the expectations of expert PA educators and clinicians. The Delphi methodology employed in this study provided a structured, iterative approach to reaching expert consensus, refining and improving EPA definitions over multiple rounds. The high level of agreement on twelve EPAs suggests that these activities represent fundamental clinical tasks that all

new PAs must be able to perform. The lack of consensus on other tasks highlights the extent to which entrustability is shaped by setting specific expectations rather than universal competency. The findings underscore the importance of distinguishing between competencies, which represent broad domains of knowledge and skill, and EPAs, which define the specific tasks that a PA can be entrusted to perform in practice. By delineating these distinctions, this study reinforces the role of EPAs as a bridge between competency attainment and workplace readiness, ensuring that clinical performance assessments align with the realities of professional practice.

The study also provides insights into how entrustability is determined in clinical settings. Thematic analysis of expert commentary revealed key factors influencing entrustment decisions, including the foundational nature of certain tasks, the degree to which EPAs were perceived as specialty-dependent, and concerns regarding risk. Tasks that were viewed as integral to safe practice were more likely to achieve consensus, while those with greater variability in agreement were often linked to specialty-specific roles or the need for additional training and experience. Notably, the study demonstrated that some EPAs failed to reach consensus not due to disagreement over their importance but rather due to a lack of conceptual clarity. Several EPAs were revised between Delphi rounds to provide greater specificity, resulting in improved agreement levels in subsequent iterations. These findings reinforce the need for ongoing refinement of EPA frameworks, ensuring that entrustable tasks are clearly described and aligned with practice expectations.

Theoretical Implications

The theoretical implications of this study further strengthen its contribution to health professions education. Grounded in social constructivism, situated learning theory, and communities of practice, this study demonstrates how entrustment decisions are inherently social and context dependent (Lave & Wenger, 1991; Vygotsky & Cole, 1978; Wenger, 2010). The findings provide evidence that EPAs are not static competency checklists but rather dynamic constructs that develop through collective expert consensus.

Social constructivist theory posits that knowledge is built through interaction, and this study illustrates how the process of EPA validation mirrors this knowledge-building process (Vygotsky & Cole, 1978). The iterative refinement of EPAs through expert feedback exemplifies the social negotiation of professional standards, reinforcing the idea that entrustability is not solely an attribute of the individual but rather a shared determination within a professional community.

Situated learning theory further informs the study's findings by highlighting how entrustment decisions are shaped by clinical context (Lave & Wenger, 1991). The high level of agreement on certain EPAs supports the notion that learning occurs within authentic settings, where foundational skills must be demonstrated in the real-world before practice privileges are granted. The variability in agreement with other EPAs, particularly those linked to specialty practice, reinforces the idea that learning is situated within specific environments, requiring progressive participation before full competency is achieved. These findings support the claim that EPAs must reflect the realities of

clinical practice, ensuring that readiness assessments align with the conditions in which new PAs are expected to function.

The concept of communities of practice also provides a valuable lens through which to interpret the study's results (Wenger, 2010). The Delphi process functioned as a community of expert educators and clinicians collaboratively shaping professional expectations for new graduates. The strong consensus on certain EPAs reflects shared professional norms, while disagreements over other tasks highlight areas where community definitions of entrustability remain unsettled. The study contributes to communities of practice theory by illustrating how professional standards evolve through structured discourse, reinforcing the idea that EPAs are developed and refined within collective professional settings rather than in isolation.

Overall, this study provides a strong foundation for the continued development of EPA frameworks in PA education. Validating a set of EPAs that reflect expert consensus establishes a data-driven model for defining workplace readiness. The findings reinforce the need for CBME models that prioritize real-world clinical performance, ensuring that assessments of PA graduates align with the expectations of educators and employers. Through its practical usefulness, empirical findings, and theoretical contributions, this study offers a framework for refining EPA development, guiding future efforts to ensure that PA graduates enter the workforce prepared to safely and effectively perform their professional responsibilities.

Limitations of the Study

The modified Delphi technique is a valuable research method, but it has limitations. There is no single set of guidelines for conducting modified Delphi studies, which can lead to variation in study implementation. These limitations include the lack of universally accepted standards such as sample size guidelines, the impact of participant quasi-anonymity, dependence on expert opinion, and variability in defining appropriate consensus levels (Keeney et al., 2011). Despite these identified limitations within the literature related to Delphi implementation, this study was carefully designed to include best practice suggestions from prior researchers. Recommendations for Delphi improvement provided by Humphrey-Murto et al. (2017) and the quality criteria from Diamond et al. (2014) were incorporated into the methodology to reflect best practices.

A limitation of this study is that I decided whether to revise specific EPAs between Delphi rounds. While this research aimed to minimize my influence on the outcomes, the decision to modify or not revise certain EPAs may have impacted the results. I revised five EPAs based on participant feedback indicating a lack of clarity, and I provided justifications to the panelists and documented these changes in the dissertation. EPAs without such panelist feedback were not revised. Although this process was subject to personal reflexivity, my background as a clinician, academic, and PA for over two decades suggests that, in addition to the data, my decisions were informed by my professional experience and positionality within the PA and academic communities. While these participants indicated that the changes did make the EPAs clearer, future validation research will give the PA community opportunities to further iterate the EPA framework.

While there have been discussions in the literature about sample sizes, there has yet to be an agreement on what constitutes an ideal sample size. Therefore, this study reflects what is currently suggested in the available literature, specifically, that a homogenous sample can allow for a small sample size. The defined expertise of clinically practicing PAs with 10 years of experience engaged in PA education is a homogenous sample. While variations in PA practice occur naturally, this study aimed to define EPAs for the entry-level PA before an individual engages in their chosen practice area. Fortunately, while a minimum sample of 10 participants was planned, the study began with 35 expert panelists and concluded with 26 individuals who completed the final survey. Despite variable sample size guidance in the literature, this study drew from the experience of an adequate sample to answer the research question.

While participants in modified Delphi studies are anonymous to each other, they are not anonymous to me, as the researcher. There may have been pressure on the respondent to answer in a way perceived as socially desirable. However, a benefit that may have been realized from this relationship is the potential for higher response rates throughout the study (Keeney et al., 2006).

The modified Delphi technique does not account for consideration of the findings in specific populations beyond that set for by the inclusion criteria. Demographic information was gathered to inform future research to validate research findings in diverse populations. This inherent limitation is important for those who build on this work and seek to validate these EPAs within a specific health professions education context.

The composition of this study's Delphi panel members who reported an academic rank differs from national PA faculty demographics, as reported in the PAEA Faculty and Directors Report 5 (2024). Notably, Assistant Professors comprised 66.7% of participants, compared to national averages of 61.7% among PA faculty and 33.9% among program directors. Associate Professors comprised 30% of this study's participants, closely aligning with the average proportion of Associate Professors across faculty (19.5%) and program directors (44.5%), which is 32%. In contrast, Professors were markedly underrepresented, comprising only 3.3% of respondents who held an academic rank compared to national averages of 7.5% among faculty and 17.4% among program directors. This variation in academic rank distribution may reflect the study's inclusion criteria, which required participants to have at least five years of full-time PA education experience, 10 years of NCCPA certification, and current clinical practice. Senior faculty, particularly full Professors, often shift toward administrative, research, and leadership responsibilities and may be less likely to continue engagement in direct clinical practice. As a result, this study may have underrepresented the perspectives of senior educators.

Recommendations for Future Research

This study provides validity evidence through expert consensus, but further research is needed to address the complexities of assessment validity and its justification. Two key dimensions of validity have been described in the context of health professions education: construct validity, which ensures assessments measure intended competencies, and implementation validity, which examines how well assessments function in practice (Schoenherr & Hamstra, 2024). Future research should build on this framework to

evaluate the validity of EPAs in PA education, particularly their alignment with competency-based frameworks and their effectiveness in assessing graduate readiness. Additionally, there have been calls for large-scale implementation studies and further validity research, reinforcing the importance of multi-level investigations to strengthen EPA-based assessments (ten Cate et al., 2021).

Alignment with Competency-Based Frameworks

Investigating how EPAs integrate with existing competency-based frameworks is essential. Research should assess whether EPAs accurately reflect the competencies required for PA practice and how they correlate with traditional assessment methods. This alignment is crucial to ensure that EPAs serve as reliable indicators of a PA's readiness for clinical responsibilities.

Supporting Learner Transitions from Education to Practice

Future research should consider how EPAs support learner identity formation, adaptation, and role clarity during the transition from PA education to clinical practice. Transition theories from Schlossberg (1989) or Meleis et al. (2010) may be considered as a basis for exploring these concepts. Such theoretical lenses may yield fresh insights into the dual role of EPAs, as both assessment tools and developmental scaffolds that guide learners through the complex journey of becoming practicing professionals.

Implementation Across Diverse Clinical Settings

The applicability of EPAs in various clinical environments warrants thorough examination. Studies should explore how EPAs are implemented in different healthcare settings, identifying potential challenges such as variations in institutional priorities, differences in supervision structures, and resistance to new assessment frameworks.

Understanding these factors can inform strategies to enhance the consistency and effectiveness of EPA utilization. Additionally, entrustment decision-making plays a crucial role in these settings, necessitating research into how faculty training and assessment protocols influence entrustment outcomes.

Longitudinal Assessment of Predictive Capability

Longitudinal research tracking PA graduates from training through practice can provide valuable insights into the predictive capability of EPAs. Such studies should evaluate whether EPA-based assessments during training accurately forecast clinical performance, decision-making skills, and patient outcomes in real-world practice. This evidence is vital for validating EPAs as tools for ensuring competent and safe patient care.

Challenges in EPA Assessment Implementation

Variations in EPA assessment methods across PA programs may impact their validity and reliability. Research should investigate the effects of differing assessment tools, faculty entrustment decisions, and program structures on EPA outcomes.

Additionally, practical challenges such as faculty resistance to change, institutional resource constraints, and the need for faculty development must be considered.

Addressing these barriers is essential for ensuring that EPAs are effectively implemented and sustained across diverse educational settings.

Comparative Studies Across Healthcare Professions

Comparative analyses of EPA utilization in various healthcare professions can offer insights into their broader applicability and effectiveness. By examining similarities and differences in EPA implementation and outcomes across disciplines, researchers can

identify universal principles and profession-specific nuances. This knowledge can guide the refinement of EPAs to better suit the unique demands of each profession.

Institutional and System-Level Implications

At the macro level, regional, national, and international stakeholders are interested in ensuring that health professions education programs produce graduates prepared to provide high-quality, safe, and effective patient care (ten Cate et al., 2021). EPAs have the potential to inform competency models across licensure, certification, and continuing professional development. Future research should explore how EPAs influence regulatory policies, healthcare workforce integration, and institutional quality measures.

In summary, strengthening the validity of EPAs in PA education demands a comprehensive research approach. Addressing these areas will help develop consistent, reliable, and widely applicable EPA-based assessments that ensure graduates' competence and preparedness for clinical practice. Future research should focus on longitudinal studies, faculty development, and macro-level policy analysis to solidify EPAs as a core component of competency-based medical education.

Conclusion

This study establishes a set of 12 EPAs for newly graduated PAs, providing an evidence-based framework to support CBME and student assessment. By engaging expert educators and clinicians through a rigorous modified Delphi process, this research has validated key workplace tasks that reflect the expectations of entry-level PA practice. The findings offer a structured approach to defining workplace readiness, aligning with

existing competency frameworks, accreditation standards, and broader trends in health professions education.

The study's outcomes reinforce that newly graduated PAs must demonstrate competency in foundational clinical skills such as history-taking, physical examination, differential diagnosis, clinical documentation, and patient management. Additionally, the inclusion of EPAs addressing communication, cultural competency, reflective learning, and interprofessional collaboration highlights the evolving emphasis on holistic, patient-centered care and professional adaptability. By achieving expert consensus, these EPAs provide a robust foundation for assessing PA graduates' preparedness to transition into clinical practice.

The findings contribute to the literature on EPAs and CBME by demonstrating how entrustment decisions are shaped by both competency attainment and professional expectations. While some EPAs achieved strong consensus early in the Delphi process, others required iterative refinement, underscoring the complexities of defining workplace-ready competencies. Additionally, the study identifies areas where further research is needed, particularly in validating EPA-based assessments, evaluating implementation in clinical training, and exploring their impact on long-term professional development.

Beyond educational implications, this study highlights the broader significance of EPAs in guiding accreditation, regulatory policies, and workforce integration. By delineating essential clinical activities, these EPAs provide a shared language for educators, preceptors, and employers, enhancing transparency in training expectations and supporting structured assessment frameworks. Future research should focus on

refining EPA-based evaluations, addressing challenges in implementation, and exploring the predictive validity of EPAs in ensuring safe and effective clinical practice.

This research provides a foundational framework to inform PA education, accreditation, and assessment strategies, ensuring that graduates are entrusted with the skills necessary to provide high-quality patient care. PA programs can better align educational outcomes with workforce expectations by integrating EPAs into curriculum design, competency evaluations, and clinical training. These findings also offer a structured approach for accreditors, educators, and policymakers to refine assessment models, support faculty development, and enhance transparency in PA training expectations. Future research should explore how EPA-based assessment strategies influence long-term professional growth, clinical safety, and the broader evolution of health professions education.

APPENDIX A – Institutional Review Board Determination

EXEMPT DETERMINATION

The IRB and the HRPO, as part of the Office of Accountability and Compliance is committed to excellence and customer service.

Please take a moment to tell us how we are doing: HRPO/IRB/OAC Customer Feedback Survey

Date: July 15, 2024

To: Karen Gordes

RE: HP-00111191

Protocol Version and ID #:

Type of Submission: Initial Review

Type of IRB Review: Exempt

Determination Date: 7/15/2024

This is to certify that University of Maryland, Baltimore (UMB) Institutional Review Board (IRB) has reviewed the above referenced protocol entitled, “Entrustable Professional Activities for Graduate Physician Associates: A

Modified Delphi Study

.”

Your protocol has been determined to be exempt under 45 CFR 46.104(d) from IRB review based on the following category(ies):

Category (2): Research that only includes interactions involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:

- (i) The information obtained is recorded by the investigator in such a manner that the identity of the Human

Subjects cannot be readily ascertained, directly or indirectly through identifiers linked to the subjects; OR

- (ii) Any disclosure of Human Subjects’ responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects’ financial standing, employability, educational advancement, or reputation; OR

- (iii) The information obtained is recorded by the investigator in such a manner that the identity of the Human Subjects can be readily ascertained, directly or indirectly through identifiers linked to the subjects, AND an

IRB conducts limited IRB review.

If the research involves children and is conducted, funded, or subject to regulation by DHHS, Dept. of Defense

(DOD), Dept. of Education (ED), Environmental Protection Agency (EPA), or Veterans Administration (VA), the

procedures are limited to (1) the observation of public behavior when the investigator(s) do not participate in the

activities being observed and/or (2) the use of educational tests and at least one of the following criteria is met:

- The information obtained is recorded by the investigator in such a manner that the identity of the Human Subjects cannot readily be ascertained, directly or indirectly through identifiers linked to the subjects; OR

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• (ii) Any disclosure of Human Subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational achievement, or reputation.

The IRB made the following determinations regarding this submission:

- No specific determinations made.

In conducting this research you are required to follow the requirements listed in the INVESTIGATOR MANUAL.

Investigators are reminded that the IRB must be notified of any changes in the study.

Research activity involving veterans or the Baltimore VA Maryland Healthcare System (BVAMHCS) as a site, must

also be approved by the BVAMHCS Research and Development Committee prior to initiation. Contact the VA

Research Office at 410-605-7131 for assistance.

In conducting this research you are required to follow the requirements listed in the INVESTIGATOR MANUAL.

Investigators are reminded that the IRB must be notified of any changes in the study. Research activity in which the

VA Maryland Healthcare System (VAMHCS) is a recruitment site or in which VA resources (i.e., space, equipment,

personnel, funding, data) are otherwise involved, must also be approved by the VAMHCS Research and Development Committee prior to initiation at the VAMHCS. Contact the VA Research Office at 410-605-7000 ext.

6568 for assistance.

The UMB IRB is organized and operated according to guidelines of the International Council on Harmonization, the

United States Office for Human Research Protections and the United States Code of Federal Regulations and

operates under Federal Wide Assurance No. FWA00007145.

If you have any questions about this review or questions, concerns, and/or suggestions regarding the Human

Research Protection

APPENDIX B – EQual Rubric

EPAs as Discrete Units of Work

- This EPA has a clearly defined beginning and end
- This EPA is independently executable to achieve a defined clinical outcome
- This EPA is specific and focused
- This EPA is observable in process
- This EPA is measurable in outcome
- This EPA is clearly distinguished from other EPAs in the framework

EPAs as Entrustable, Essential, and Important Tasks of the Profession

- This EPA describes work that is essential and important to the profession
- Performing this EPA leads to recognized output or outcome of labor
- The performance of this EPA in clinical practice is restricted to qualified personnel
- This EPA addresses professional work that is suitable for entrustment

EPAs' Curricular Role

- This EPA requires the application of knowledge, skills, and/or attitudes (KSAs) acquired through training
- This EPA involves application and integration of multiple domains of competence
- The EPA title describes a task, not qualities or competencies of a learner
- This EPA describes a task and avoids adjectives (or adverbs) that refer to proficiency

Note. Each question is associated with a 5-point Likert scale. Table developed from Meyer, E., Taylor, D., Uijtdehaage, S. and Durning, S. (2020). EQual Rubric Evaluation of the Association of American Medical Colleges' Core Entrustable Professional Activities for Entering Residency. *Academic Medicine*, 95 (11), 1755-1762. doi: 10.1097/ACM.0000000000003504.

APPENDIX C – EQual Rubric Scores for Entrustable Professional Activities

Studied

EPA Number	EPA Title
1	Give or receive a patient handover to transition care responsibility
2	Enter and discuss orders and prescriptions
3	Obtain informed consent for tests and/or procedures
4	Perform general procedures of a physician
5	Gather a history and perform a physical examination
6	Form clinical questions and retrieve evidence to advance patient care
7	Document a clinical encounter in the patient record
8	Prioritize a differential diagnosis following a clinical encounter
9	Provide an oral presentation of a clinical encounter
10	Recognize a patient requiring urgent or emergent care and initiate evaluation and management.
11	Recommend and interpret common diagnostic and screening tests
12	Evaluate ethical dilemmas in patient care
13	Demonstrate collaborative care coordination
14	Critically analyze and apply biomedical knowledge
15	Develop and implement patient management plans.
16	Provide transfer of care in a variety of settings.
17	Gather essential and accurate information about patients through history-taking, physical examination, and the use of laboratory data, imaging, and other methods.
18	Facilitate relationship building through communication
19	Improve clinical practice through reflective learning
20	Provide preventive health care services and education.
21	Contribute to the fiscally sound and ethical management of a practice.
22	Locate, critically evaluate, integrate, and appropriately apply scientific evidence to patient care.
23	Facilitate the learning of students and other health care professionals.
24	Incorporate principles of cultural competence across the health care continuum.
25	Collaborate as a member of an interprofessional team
26	Recognize and develop strategies to address system biases that contribute to health care disparities.
27	Use information technology to manage information and optimize patient care.
28	Identify system failures and contribute to a culture of safety and improvement.
29	Apply public health principles to improve care for patients, populations, communities, and systems.
30	Work and communicate effectively as a leader or member of an interprofessional health care team to provide patient-centered care
31	Identify system failures and contribute to a culture of safety and improvement

32	Identify and correct gaps in knowledge, skills, or attitudes.
33	Develop and manage interpersonal interactions.

EPAs That Met the EQUAL Rubric Scoring Criteria for Study Inclusion.

Source	AAMC, AACOM	AAMC, AACOM	AAMC, AACOM	AAMC, AACOM	AAMC, AACOM	AAMC, AACOM	AAMC, AACOM	AAMC, AACOM	AAMC, AACOM	AAMC, AACOM	AAMC, AACOM	New	New	New	Lohenry et al., 2017	Lohenry et al., 2017	Lohenry et al., 2017	New	New	Lohenry et al., 2017
Profession	MD, DO	MD, DO	MD, DO	MD, DO	MD, DO	MD, DO	MD, DO	MD, DO	MD, DO	MD, DO	MD, DO				PA	PA	PA			PA
EPA Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
This EPA has a clearly defined beginning and end	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	1	4	5	3
This EPA is independently executable to achieve a defined clinical outcome	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	1	1	5	5	1
This EPA is specific and focused	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	3	3	5	4	3
This EPA is observable in process	5	5	5	5	5	5	5	5	5	5	5	3	5	3	4	5	5	5	3	3
This EPA is measurable in outcome	5	5	5	5	5	5	5	5	5	5	5	4	4	4	3	4	5	3	3	4
This EPA is clearly distinguished from other EPAs in the framework	5	5	5	5	5	5	5	5	5	5	5	5	2	5	4	4	5	5	5	4
This EPA describes work that is essential and important to the profession	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Performing this EPA leads to recognized output or outcome of labor	5	5	5	5	5	5	5	5	5	5	5	4	5	3	4	4	5	1	3	3
The performance of this EPA in clinical practice is restricted to qualified personnel	5	5	5	5	1	1	1	1	1	1	1	3	3	3	4	4	4	1	1	3
This EPA addresses professional work that is suitable for entrustment	5	5	5	5	5	5	5	5	5	5	5	5	4	4	5	4	5	3	3	4
This EPA requires the application of knowledge, skills, and/or attitudes (KSA) acquired through training	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	4

This EPA involves application and integration of multiple domains of competence	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
This EPA title describes a task, not qualities or competencies of a learner	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
This EPA describes a task and avoid adjectives (or adverbs) that refer to proficiency	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	5	5	5
sum	70	70	70	70	66	66	66	66	66	66	66	64	63	62	60	58	57	57	57	52
average	5.00	5.00	5.00	5.00	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.57	4.50	4.43	4.29	4.14	4.07	4.07	4.07	3.71
standard deviation	0.00	0.00	0.00	0.00	1.07	1.07	1.07	1.07	1.07	1.07	1.07	0.76	0.94	0.85	0.73	1.10	1.49	1.49	1.27	1.14
percentage of the 5-point Likert scale	1.00	1.00	1.00	1.00	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.91	0.90	0.89	0.86	0.83	0.81	0.81	0.81	0.74

EPAs That Did Not Meet the EQual Rubric Scoring Criteria for Study Inclusion

Source	Lohenry, et al., 2017	Lohenry, et al., 2017	Lohenry, et al., 2017	Lohenry, et al., 2017	AAMC, AACOM	Lohenry, et al., 2017	Lohenry, et al., 2017	Lohenry, et al., 2017	Lohenry, et al., 2017	Lohenry, et al., 2017	AAMC, AACOM	Lohenry, et al., 2017	Lohenry, et al., 2017
Profession	PA	PA	PA	PA	MD, DO	PA	PA	PA	PA	PA	MD, DO	PA	PA
EPA Number	21	22	23	24	25	26	27	28	29	30	31	32	33
This EPA has a clearly defined beginning and end	1	1	1	1	1	2	1	2	1	1	1	1	3
This EPA is independently executable to achieve a defined clinical outcome	2	1	3	1	5	1	1	1	1	1	1	1	1
This EPA is specific and focused	2	4	2	1	5	2	2	1	2	1	1	1	1
This EPA is observable in process	2	2	3	5	3	2	3	2	1	3	1	2	2
This EPA is measurable in outcome	4	2	2	3	3	3	2	2	1	3	2	3	2
This EPA is clearly distinguished from other EPAs in the framework	5	3	4	4	5	3	4	3	2	3	1	2	1
This EPA describes work that is essential and important to the profession	4	4	3	5	5	4	5	3	3	4	5	4	4
Performing this EPA leads to recognized output or outcome of labor	3	3	2	3	1	2	3	2	3	2	1	3	2
The performance of this EPA in clinical practice is restricted to qualified personnel	3	3	3	2	1	2	3	3	2	1	1	1	1
This EPA addresses professional work that is suitable for entrustment	2	5	4	3	1	4	4	3	3	4	1	4	2
This EPA requires the application of knowledge, skills, and/or attitudes (KSA) acquired through training	4	5	3	3	3	3	3	3	4	3	5	2	2
This EPA involves application and integration of multiple domains of competence	5	5	5	5	1	4	1	5	5	5	5	5	4

This EPA title describes a task, not qualities or competencies of a learner	5	4	5	3	5	5	5	5	5	4	5	1	3
This EPA describes a task and avoid adjectives (or adverbs) that refer to proficiency	5	3	5	5	5	5	4	5	5	3	5	5	5
sum	47	45	45	44	44	42	41	40	38	38	35	35	33
average	3.36	3.21	3.21	3.14	3.14	3.00	2.93	2.86	2.71	2.71	2.50	2.50	2.36
standard deviation	1.39	1.37	1.25	1.51	1.83	1.24	1.38	1.35	1.54	1.33	1.95	1.51	1.28
percentage of the 5-point Likert scale	0.67	0.64	0.64	0.63	0.63	0.60	0.59	0.57	0.54	0.54	0.50	0.50	0.47

APPENDIX D – Pilot Survey

Delphi Pilot Survey

Q0 Introduction: You are invited to participate in a Delphi study to develop consensus-based EPAs for newly graduated PAs. Your expertise in PA education and practice is crucial for the success of this study.

Delphi Method: The Delphi method is an iterative process involving three rounds of surveys to achieve consensus among experts.

General Instructions for All Rounds

Confidentiality: Your responses will be anonymous to other participants, and data will be presented in aggregate form only. The researcher needs to be able to connect your answers to your identity so that you can receive personalized feedback between survey rounds.

Technical Aspects: If you encounter any technical issues while completing the survey, please contact the researcher at dbunnell@umaryland.edu.

Time: We estimate that the survey will take 15 minutes to complete.

Q0.1 Delphi Round 1

Review and Rate EPAs: You will be presented with a list of EPAs derived from the literature. Rate each EPA based on its relevance and importance for newly graduated PAs using the provided Likert scale.

Provide Qualitative Feedback: For each EPA, you are encouraged to provide comments, explanations for your ratings, or suggestions for modifications.

Suggest Additional EPAs: If you believe an important EPA is missing, please suggest it along with a brief rationale.

A newly graduated PA should be able to perform the following at graduation.

Q1 Document a clinical encounter in the patient record.

Strongly Disagree (1)

Disagree (2)

Agree (3)

Strongly Agree (4)

Q2 What level should a new PA be trusted to perform "Document a clinical encounter in the patient record?"

May be present but may not practice EPA (1)
May practice EPA under direct (proactive) supervision (2)
May practice EPA under indirect (reactive) supervision (3)
May practice EPA unsupervised (under distant oversight) (4)
May act as supervisor for junior trainees for this EPA (5)

Q3 What influenced your response to the question about documenting a clinical encounter in the patient record?

Q4 Provide transfer of care in a variety of settings.

Strongly Disagree (1)
Disagree (2)
Agree (3)
Strongly Agree (4)

Q5 What level should a new PA be trusted to perform "Provide transfer of care in a variety of settings?"

May be present but may not practice EPA (1)
May practice EPA under direct (proactive) supervision (2)
May practice EPA under indirect (reactive) supervision (3)
May practice EPA unsupervised (under distant oversight) (4)
May act as supervisor for junior trainees for this EPA (5)

Q6 What influenced your response to the question about providing transfer of care in various settings?

Q7 Develop and implement patient management plans

Strongly Disagree (1)
Disagree (2)
Agree (3)
Strongly Agree (4)

Q8 What level should a new PA be trusted to perform "Develop and implement patient management plans?"

May be present but may not practice EPA (1)
May practice EPA under direct (proactive) supervision (2)
May practice EPA under indirect (reactive) supervision (3)
May practice EPA unsupervised (under distant oversight) (4)
May act as supervisor for junior trainees for this EPA (5)

Q9 What influenced your response to the questions about developing and implementing patient management plans?

Q10 Enter and discuss orders and prescriptions.

- Strongly Disagree (1)
- Disagree (2)
- Agree (3)
- Strongly Agree (4)

Q11 What level should a new PA be trusted to perform "Enter and discuss orders and prescriptions?"

- May be present but may not practice EPA (1)
- May practice EPA under direct (proactive) supervision (2)
- May practice EPA under indirect (reactive) supervision (3)
- May practice EPA unsupervised (under distant oversight) (4)
- May act as supervisor for junior trainees for this EPA (5)

Q12 What influenced your response to the questions about entering and discussing orders and prescriptions?

13 Prioritize a differential diagnosis following a clinical encounter.

- Strongly Disagree (1)
- Disagree (2)
- Agree (3)
- Strongly Agree (4)

Q14 What level should a new PA be trusted to perform "Prioritize a differential diagnosis following a clinical encounter?"

- May be present but may not practice EPA (1)
- May practice EPA under direct (proactive) supervision (2)
- May practice EPA under indirect (reactive) supervision (3)
- May practice EPA unsupervised (under distant oversight) (4)
- May act as supervisor for junior trainees for this EPA (5)

Q15 What influenced your response to the question about prioritizing a differential diagnosis following a clinical encounter?

Q16 Form clinical questions and retrieve evidence to advance patient care

- Strongly Disagree (1)
- Disagree (2)
- Agree (3)
- Strongly Agree (4)

Q17 What level should a new PA be trusted to perform "Form clinical questions and retrieve evidence to advance patient care?"

- May be present but may not practice EPA (1)
- May practice EPA under direct (proactive) supervision (2)
- May practice EPA under indirect (reactive) supervision (3)

May practice EPA unsupervised (under distant oversight) (4)
May act as supervisor for junior trainees for this EPA (5)

Q18 What influenced your response to the question about forming a clinical question and retrieving evidence to advance patient care?

Q19 Obtain informed consent for tests and/or procedures.

Strongly Disagree (1)
Disagree (2)
Agree (3)
Strongly Agree (4)

Q20 What level should a new PA be trusted to perform "Obtain informed consent for tests and/or procedures?"

May be present but may not practice EPA (1)
May practice EPA under direct (proactive) supervision (2)
May practice EPA under indirect (reactive) supervision (3)
May practice EPA unsupervised (under distant oversight) (4)
May act as supervisor for junior trainees for this EPA (5)

Q21 What influenced your response to the question about obtaining informed consent for tests and/or procedures?

Q22 Provide an oral presentation of a clinical encounter.

Strongly Disagree (1)
Disagree (2)
Agree (3)
Strongly Agree (4)

Q23 What level should a new PA be trusted to perform "Provide an oral presentation of a clinical encounter?"

May be present but may not practice EPA (1)
May practice EPA under direct (proactive) supervision (2)
May practice EPA under indirect (reactive) supervision (3)
May practice EPA unsupervised (under distant oversight) (4)
May act as supervisor for junior trainees for this EPA (5)

Q24 What influenced your response to the question about providing an oral presentation of a clinical encounter?

Q25 Give or receive a patient handover to transition care responsibility.

Strongly Disagree (1)
Disagree (2)

Agree (3)
Strongly Agree (4)

Q26 What level should a new PA be trusted to perform "Give or receive a patient handover to transition care responsibility?"

May be present but may not practice EPA (1)
May practice EPA under direct (proactive) supervision (2)
May practice EPA under indirect (reactive) supervision (3)
May practice EPA unsupervised (under distant oversight) (4)
May act as supervisor for junior trainees for this EPA (5)

Q27 What influenced your response to the question about giving or receiving a patient handover or transitioning care responsibility?

Q28 Provide preventive health care services and education.

Strongly Disagree (1)
Disagree (2)
Agree (3)
Strongly Agree (4)

Q29 What level should a new PA be trusted to perform "Provide preventive health care services and education?"

May be present but may not practice EPA (1)
May practice EPA under direct (proactive) supervision (2)
May practice EPA under indirect (reactive) supervision (3)
May practice EPA unsupervised (under distant oversight) (4)
May act as supervisor for junior trainees for this EPA (5)

Q30 What influenced your response to the question about providing preventative health care services and education?

Q31 Gather a history and perform a physical examination

Strongly Disagree (1)
Disagree (2)
Agree (3)
Strongly Agree (4)

Q32 What level should a new PA be trusted to perform "Gather a history and perform a physical examination?"

May be present but may not practice EPA (1)
May practice EPA under direct (proactive) supervision (2)
May practice EPA under indirect (reactive) supervision (3)
May practice EPA unsupervised (under distant oversight) (4)
May act as supervisor for junior trainees for this EPA (5)

Q33 What influenced your response to the question about gathering a history and performing a physical examination?

Q34 Perform general procedures of a PA.

Strongly Disagree (1)

Disagree (2)

Agree (3)

Strongly Agree (4)

Q35 What level should a new PA be trusted to perform "Perform general procedures of a PA?"

May be present but may not practice EPA (1)

May practice EPA under direct (proactive) supervision (2)

May practice EPA under indirect (reactive) supervision (3)

May practice EPA unsupervised (under distant oversight) (4)

May act as supervisor for junior trainees for this EPA (5)

Q36 What influenced your response to the question about performing the general procedures of a PA?

Q37 Recommend and interpret common diagnostic and screening tests.

Strongly Disagree (1)

Disagree (2)

Agree (3)

Strongly Agree (4)

Q38 What level should a new PA be trusted to perform "Recommend and interpret common diagnostic and screening tests?"

May be present but may not practice EPA (1)

May practice EPA under direct (proactive) supervision (2)

May practice EPA under indirect (reactive) supervision (3)

May practice EPA unsupervised (under distant oversight) (4)

May act as supervisor for junior trainees for this EPA (5)

Q39 What influenced your response to the question about recommending and interpreting common diagnostic and screening tests?

Q40 Recognize a patient requiring urgent or emergent care and initiate evaluation and management.

Strongly Disagree (1)

Disagree (2)

Agree (3)

Strongly Agree (4)

Q41 What level should a new PA be trusted to perform "Recognize a patient requiring urgent or emergent care and initiate evaluation and management?"

- May be present but may not practice EPA (1)
- May practice EPA under direct (proactive) supervision (2)
- May practice EPA under indirect (reactive) supervision (3)
- May practice EPA unsupervised (under distant oversight) (4)
- May act as supervisor for junior trainees for this EPA (5)

Q42 What influenced your response to the question about recognizing a patient requiring urgent or emergent care and initiating evaluation and management?

Q43 Critically analyze and apply biomedical knowledge.

- Strongly Disagree (1)
- Disagree (2)
- Agree (3)
- Strongly Agree (4)

Q44 What level should a new PA be trusted to perform "Critically analyze and apply biomedical knowledge?"

- May be present but may not practice EPA (1)
- May practice EPA under direct (proactive) supervision (2)
- May practice EPA under indirect (reactive) supervision (3)
- May practice EPA unsupervised (under distant oversight) (4)
- May act as supervisor for junior trainees for this EPA (5)

Q45 What influenced your response to the question about critically analyzing and applying biomedical knowledge?

Q46 Facilitate relationship building through communication.

- Strongly Disagree (1)
- Disagree (2)
- Agree (3)
- Strongly Agree (4)

Q47 What level should a new PA be trusted to perform "Facilitate relationship building through communication?"

- May be present but may not practice EPA (1)
- May practice EPA under direct (proactive) supervision (2)
- May practice EPA under indirect (reactive) supervision (3)
- May practice EPA unsupervised (under distant oversight) (4)
- May act as supervisor for junior trainees for this EPA (5)

Q48 What influenced your response to the question about facilitating relationship building through communication?

Q49 Demonstrate collaborative care coordination.

Strongly Disagree (1)

Disagree (2)

Agree (3)

Strongly Agree (4)

Q50 What level should a new PA be trusted to perform "Demonstrate collaborative care coordination?"

May be present but may not practice EPA (1)

May practice EPA under direct (proactive) supervision (2)

May practice EPA under indirect (reactive) supervision (3)

May practice EPA unsupervised (under distant oversight) (4)

May act as supervisor for junior trainees for this EPA (5)

Q51 What influenced your response to the question about demonstrating collaborative care coordination?

Q52 Evaluate ethical dilemmas in patient care.

Strongly Disagree (1)

Disagree (2)

Agree (3)

Strongly Agree (4)

Q53 What level should a new PA be trusted to perform "Evaluate ethical dilemmas in patient care?"

May be present but may not practice EPA (1)

May practice EPA under direct (proactive) supervision (2)

May practice EPA under indirect (reactive) supervision (3)

May practice EPA unsupervised (under distant oversight) (4)

May act as supervisor for junior trainees for this EPA (5)

Q54 What influenced your response to the question about evaluating ethical dilemmas in patient care?

Q55 Improve clinical practice through reflective learning.

Strongly Disagree (1)

Disagree (2)

Agree (3)

Strongly Agree (4)

Q56 What level should a new PA be trusted to perform "Improve clinical practice through reflective learning?"

May be present but may not practice EPA (1)

May practice EPA under direct (proactive) supervision (2)

May practice EPA under indirect (reactive) supervision (3)

May practice EPA unsupervised (under distant oversight) (4)

May act as supervisor for junior trainees for this EPA (5)

Q57 What influenced your response to the question about evaluating ethical dilemmas in patient care?

Q58 Are there any observable clinical tasks that a newly graduated PA should perform missing from this survey? Please explain.

APPENDIX E - Pilot Study

The pilot study provided critical insights into refining the Delphi survey instrument and methodology, addressing both technical and conceptual challenges. Through this process, I identified specific areas for enhancement, such as improving participant instructions and refining survey questions. These lessons informed strategic adjustments to ensure the robustness and validity of the primary study, enhancing the overall research process.

Technical Familiarization and Workflow Optimization

Conducting the pilot study enabled me to gain familiarity with the technical aspects of the Qualtrics platform. Communication strategies and survey statements were refined to enhance clarity, ensuring participants fully understood the process and their role in providing meaningful feedback. This process optimized both research workflows and the participant's experience.

Profile of Pilot Participants

The six pilot participants represented diverse roles within PA education, including a program director, clinical education director, didactic education director, principal faculty member, a course director who also serves as a preceptor, and a Doctor of Medical Science program director with prior experience as a dean in a college of health sciences. Their academic ranks included two professors, three assistant professors, and one instructor. The participants' clinical backgrounds spanned family medicine, pediatrics, emergency medicine, general surgery, urology, allergy/immunology, and military medicine ensuring a broad range of expertise. Demographically, the group included four men and two women, all identifying as White.

Clarity of Instructions

While participants found the instructions clear, some confusion arose regarding the context for their responses. Specifically, whether to draw on their clinical, educational, or administrative experience. To address this, the primary study instructions were amended to explicitly guide participants to integrate insights from their PA education and clinical experiences, ensuring more contextualized responses.

Questionnaire Design and EPA Refinement

Feedback from the pilot study revealed several areas for improvement in questionnaire design. Participants highlighted ambiguity in the distinction between questions assessing levels of supervision and those measuring agreement with an EPA. To address this, these distinctions were clarified in the main study, leading to a more seamless flow and reducing respondents' cognitive load. Additionally, duplicate questions were identified during the pilot. These redundancies were eliminated to streamline the questionnaire and enhance the participant's experience.

Further, participants suggested adding new EPAs to better capture critical competencies. Specifically, they proposed the following EPAs: *Perform Medical Coding and Billing for Patient Encounters* and *Conduct Culturally Competent Patient Interviews and Assessments*. These recommendations addressed gaps identified in the original questionnaire to include vital administrative and cultural perspectives. These refinements resulted in a more comprehensive and user-friendly survey instrument for the primary study.

Response Time and Participant Engagement

Participants reported acceptable completion times for survey rounds (15 - 20 minutes). However, the Qualtrics survey completion time data noted significant variations in duration, likely due to delays from opening the survey to its initiation. This suggested that the survey platform data was not interpretable to gauge actual participant engagement time. For the primary study, efforts focused on balancing comprehensiveness with conciseness to minimize participant fatigue.

Regular engagement strategies were implemented to sustain motivation and completion rates. These strategies included personalized reminders tailored to individual participants to encourage their continued involvement. Additionally, progress updates were provided to keep participants informed about the study's status and the importance of their contributions, fostering a sense of accountability and commitment to completing the survey rounds.

Understanding the EPA Process

One participant indicated a lack of understanding of the EPA process in early rounds, which could have affected their responses. To address this, the primary study highlighted the pre-survey orientation message, offering a detailed explanation of the EPA framework, its relevance, and its application in PA education. Concise reminders were also provided at the start of each survey round, reinforcing these key concepts and ensuring participant confidence throughout the study.

Survey Scale Adjustments

The pilot study employed a 4-point Likert scale to drive clear consensus. While effective in avoiding neutral responses, this scale limited the nuance of participant

opinions. Based on reflections and participant feedback, the scale was expanded to a 5-point Likert scale in the primary study, allowing for a neutral midpoint. This change enabled participants to express more nuanced perspectives and provided richer data for analysis. This adjustment facilitated a more comprehensive evaluation and informed revisions to EPAs based on participant input.

Participant Attrition

Attrition posed a challenge, with only five of six participants completing all three rounds. A structured follow-up plan for the primary study was developed to mitigate this. Personalized reminders, progress updates, and communications emphasizing the value of participant contributions were employed to foster engagement and responsibility and thereby reduce dropout rates.

Lessons Learned

The pilot study was foundational in refining the Delphi survey instrument. Insights gained informed critical adjustments to the primary study, including improved instructions, streamlined questionnaire design, expanded response scales, and robust engagement strategies. Including new EPAs enhanced the study's comprehensiveness, addressing administrative and cultural competence domains. These enhancements positioned the primary study to achieve higher response rates, valid data, and meaningful contributions to developing EPAs for newly graduated PAs.

APPENDIX F – Recruitment Letter

Subject: Invitation to Participate in a Delphi Study on Entrustable Professional Activities for Physician Assistant

Dear [Potential Participant's Name],

I am David J. Bunnell, MSHS, PA-C, leading a research study at the University of Maryland, Baltimore. The focus is developing Entrustable Professional Activities (EPAs) for newly graduated Physician Assistants/Associates (PA), employing a specific approach known as the modified Delphi method. Your PA education and clinical practice expertise positions you as a key contributor to this vital work.

Understanding EPAs:

EPAs are tasks or responsibilities essential for clinical practice. They involve assessing a learner's competence in carrying out specific professional activities that are crucial in clinical settings, such as patient care management, clinical evaluation, and medical decision-making.

The Modified Delphi Method Explained:

The Delphi research method is a structured survey technique that relies on a panel of experts who answer questionnaires in iterative survey rounds, with the anonymous summary of the experts' opinions from the previous round being used to reflect on and revise earlier answers. This approach involves a select group of PA experts who participate in a structured three-round survey process, aiming to efficiently reach a consensus while deeply valuing each expert's insights.

Your Role and Commitment:

As a participant, you will be involved in completing three online surveys over approximately two to three months. Each survey is thoughtfully constructed to balance comprehensiveness with respect for your time, typically requiring about 30 minutes. The surveys will present you with various statements about EPAs for your evaluation and commentary, with each round refining these based on collective feedback.

Confidentiality and Data Handling:

While your survey responses will be accessible to me for analysis and providing personalized feedback, they will be kept confidential. Rest assured that your identity will not be shared with other participants, upholding the privacy and integrity of your valuable contributions.

Participant Selection:

We invite PAs who meet the following criteria:

- At least ten years of clinical practice as a PA.
- Current NCCPA (National Commission on Certification of Physician Assistants) certification.

- Current medical or surgical practice as a PA.
- For full-time PA educators: At least five years of experience in a PA educator role.
- For preceptors: Experience with precepting at least ten PA students in the past two years.
- For full-time PA educators: academic rank of at least Assistant Professor

These criteria ensure that our study benefits from a wide range of experiences and current insights from the field.

Feedback Process:

After each survey round, a summary of the collective responses will be provided to you. This feedback is integral to the Delphi method, allowing for informed reflection and input in subsequent rounds, thereby enhancing the study's data quality and relevance.

I appreciate your consideration for participating in this research. For any inquiries or to express your interest, please contact me at dbunnell@umaryland.edu.

Thank you for considering this unique opportunity. Your expertise is vital to the success of this study.

Warm regards,
David J. Bunnell, MSHS, PA-C, DFAAPA
Assistant Professor, Graduate School
University of Maryland, Baltimore
dbunnell@umaryland.edu

APPENDIX G – Informed Consent and Participant Education Information

RESEARCH CONSENT FORM

Please review this document that contains informed consent information and education about key concepts related to entrustable professional activities and the modified-Delphi research methodology.

YOUR SIGNATURE IS NOT NECESSARY BECAUSE SURVEY PARTICIPATION WILL SERVE AS YOUR CONSENT TO PARTICIPATE IN THIS RESEARCH.

If you have any questions, please contact:

David J. Bunnell, MSHS, PA-C, DFAAPA
PhD candidate
Assistant Professor, Graduate School
University of Maryland, Baltimore
dbunnell@umaryland.edu

Karen Gordes, PhD, PT, DPT
Principal Investigator
Professor, Graduate School
University of Maryland, Baltimore
karen.gordes@umaryland.edu

Protocol Title: Entrustable Professional Activities for Graduate Physician Associates:
A Modified Delphi Study

Study No.: HP-00111191

Principal Investigator: Karen Gordes, PhD, PT, DPT

Throughout this document, “You” always refers to the person taking part in the study.)

CONCISE SUMMARY:

This Study is Research and Participation is Voluntary:

This document pertains to your potential involvement in a research study. Participation in this study is entirely voluntary, and you may choose to withdraw at any time without penalty.

Purpose of the Research:

The aim of this study was to develop Entrustable Professional Activities (EPAs) for newly graduated Physician Assistants (PAs), using a modified Delphi method.

Procedures and Duration:

If you choose to participate, you will be asked to complete three rounds of electronic survey questionnaires. These questionnaires will ask for your feedback on EPA statements. The study is expected to last for two to three months, and your participation in each survey round will contribute valuable insights to the research.

Key Risks and Benefits:

The primary risk associated with your participation is the time commitment required to complete the surveys. You might also experience discomfort in sharing your individual opinions. There are no physical risks involved as this study does not include experimental procedures. While there are no direct personal benefits to you, your participation will contribute to enhancing PA education and developing effective EPAs. This could have a lasting positive impact on the PA community and future PA graduates.

Other Key Information:**Confidentiality**

Your privacy and the confidentiality of your information are paramount in this study. Please be assured that your identity will not be disclosed to other participants. All identifiable information will be securely stored within the University of Maryland, Baltimore's computer systems and will be accessible only to the primary researcher. This access is necessary to provide you with personalized feedback on the surveys, which is an integral part of the modified Delphi methodology used in this study. Once the research is completed, any research data containing individually identifiable information will be destroyed to further ensure your privacy and confidentiality.

Compensation

There is no compensation for participation, nor are there any costs associated with participation.

Alternative Procedures

Since this study is focused on gathering expert opinions, there are no alternative procedures involved.

Contact Information

For any questions about the research, your rights as a participant, or in the event of a research-related concern, please contact David J. Bunnell, MSHS, PA-C at dbunnell@umaryland.edu.

PURPOSE OF STUDY

The primary goal of this research study is to develop Entrustable Professional Activities (EPAs) for newly graduated Physician Assistants (PAs). This is achieved through a modified Delphi method, which involves surveying expert PA stakeholders. The purpose is to gather consensus on expert opinions regarding EPAs that align with the Competencies for the PA Profession. This study will contribute valuable insights and validation evidence for these EPAs, enhancing the framework for PA education and practice at the entry level.

WHAT ARE MY RESPONSIBILITIES IF I TAKE PART IN THIS RESEARCH STUDY?

If you take part in this study, you will be responsible to:

Complete Surveys: You will be required to complete three online surveys. It is important that you answer each survey question to the best of your knowledge and belief.

Your insights and expertise are crucial to the success of this study.

Provide Honest Feedback: Your honest and thoughtful feedback, especially in the qualitative comment sections of the surveys, is vital. This will help in accurately capturing expert opinions on Entrustable Professional Activities (EPAs) for newly graduated Physician Assistants.

Participate in a Timely Manner: Responding to each round of the survey within the specified time is important. Timely responses ensure the study progresses as planned and that the data collected is relevant and current.

Maintain Confidentiality: While your individual responses will be kept confidential, it is important that you also maintain the confidentiality of the study content. This includes not sharing survey questions or your responses with others who might be participating in or are outside of the study.

Report Changes: If there are any changes in your contact information or availability during the study, it is your responsibility to inform the research team. This ensures that you continue to receive all necessary communications related to the study.

Ask Questions: If you have questions or concerns about the study or your participation in it, feel free to contact the research team. Your understanding of the study and its processes is essential.

Adhere to Instructions: Following any specific instructions provided in the surveys or by the research team is important. This may include instructions on how to rate statements, provide comments, or any other procedural guidelines.

Notify of Withdrawal: If you decide to withdraw from the study at any point, it is your responsibility to notify the researcher as soon as possible. This allows the team to manage the study data accordingly and understand any reasons for withdrawal that could be important for the study's integrity.

POTENTIAL RISKS/DISCOMFORTS:

Foreseeable Risks or Discomforts

Psychological Discomfort: Given that this study involves completing surveys on professional activities, it is possible that some questions may cause minor discomfort or stress, especially if they touch upon challenging aspects of PA practice or education. This risk is considered unlikely and comparable to the natural discomfort one might experience when reflecting on professional challenges.

Risk of Loss/Breach of Confidentiality: There is always a small risk associated with the loss or breach of confidentiality in studies involving data collection. This risk is considered less likely but is not entirely avoidable. Your personal information and responses will be handled with strict confidentiality measures to mitigate this risk.

Risk to Privacy: Although your responses will be stored securely, there remains a risk that your participation could be inferred if someone were to see you accessing or

completing the surveys. This risk is considered *less likely* but can be avoided by accessing the surveys in a private location and ensuring that your responses are not visible to others.

Data Security: To minimize the risk of loss of confidentiality, all electronic data will be password-protected and stored on secure, encrypted servers. Access to this data will be restricted to the researcher.

Support for Participants: Should any discomfort arise from participating in the study, participants are encouraged to contact the researcher for support and further information. Given the nature of this survey-based research, unforeseeable risks are considered extremely rare.

POTENTIAL BENEFITS

Expected Potential Benefits to the Participant

No Direct Personal Benefit: It is important to understand that you will not benefit directly from your participation in this study. Your participation's main aim is to contribute to research and consensus building in PA education, rather than personal gain.

Professional Contribution: As a participant in this study, you will contribute to the development of Entrustable Professional Activities (EPAs) for newly graduated Physician Assistants. While this may not directly benefit you, your contribution is valuable in shaping the future of PA education and practice.

Educational Value: Participation in this study may offer indirect educational benefits, as it provides an opportunity to reflect on and discuss the competencies and standards relevant to the PA profession. However, this is not a guaranteed benefit.

General Benefits for Science and Others

Advancement in PA Education and Practice: The knowledge gained from this study may benefit the PA profession at large by helping to define and standardize EPAs for newly graduated PAs. This could indirectly impact the quality of education and practice in the PA field.

Contribution to Broader Understanding: Your participation helps in advancing our understanding of how EPAs can be effectively integrated into PA education, potentially influencing curriculum development and professional standards.

ALTERNATIVES TO PARTICIPATION

Since this is a research study focused on surveying experts in Physician Assistant (PA) education and practice, and not a treatment study, the alternative to participation is simply choosing not to participate.

COSTS TO SUBJECTS

As a participant in this research study, there will be no additional costs incurred by you. All procedures and requirements related to your participation will be provided at no cost. Your participation in this study is voluntary, and you will not be responsible for any expenses related to the study.

PAYMENT TO SUBJECTS

You will not be paid for taking part in this study.

STUDY-RELATED INJURY

If you have an injury, promptly seek medical care from any healthcare provider. If you have an emergency, call 911 or go to the nearest emergency room. You should tell the healthcare provider that you have participated in a research study.

CONFIDENTIALITY AND ACCESS TO RECORDS

Handling of Confidential Information

The study will involve the collection and handling of confidential information, primarily your responses to the survey questions.

Access to Information: Access to your personal and survey data will be limited to the research team.

De-identification/Coding: All data will be de-identified or coded to ensure your anonymity. This means that your name or other direct identifiers will not be attached in the data analysis or reporting phases.

Confidentiality Measures: The researcher will employ several measures to ensure that your information is maintained in a confidential manner. This includes secure, password-protected electronic data storage, restricted access to data, and adherence to data protection protocols.

Storage and Destruction: Confidential information will be securely stored during the study and will be destroyed at the end of the study.

Review of Study Records

Study records, including the data collected from participants, may be reviewed by federal agencies, private sponsors, and the Institutional Review Board (IRB). This is to ensure the study's adherence to research protocols and ethical guidelines. These reviews will also respect and maintain the confidentiality of your personal information.

Your participation in this study includes the understanding that your information will be handled with the utmost confidentiality, with robust measures in place to protect your privacy. If you have concerns about confidentiality and data handling, please discuss them with the researcher.

Efforts will be made to limit disclosure of your personal information, including research study and medical records, to people who have a need to review this information. We cannot promise complete secrecy. Organizations that may inspect and copy your information include the IRB and other representatives of the University of Maryland, Baltimore (UMB), or the study site.

The data from the study may be published. However, you will not be identified by name. People designated from the institutions where the study is being conducted, and people from the sponsor will be allowed to inspect sections of your medical and research records related to the study. Everyone using study information will work to keep their personal information confidential. Your personal information will not be given out unless required by law.

RIGHT TO WITHDRAW

Your participation in this study is voluntary. You do not have to take part in this study. You are free to withdraw your consent at any time. Your refusal to take part or your decision to stop taking part in the study will involve no penalty or loss of benefits to which you are otherwise entitled. If you decide to stop taking part, or if you have questions, concerns, or complaints, or if you need to report a study-related injury, please contact the investigator David J. Bunnell, 301-807-4095, djbunnell@umaryland.edu.

In this study, there are no adverse consequences (physical, social, economic, legal, or psychological) associated with your decision to withdraw. Your choice to withdraw from the study will be respected without any negative impact on you.

If you withdraw from this study, the already collected data may not be removed from the study database. Your data collected up until the point of withdrawal will remain a part of the study records but will continue to be handled with confidentiality.

If you are an employee or student at the University of Maryland, Baltimore (UMB), please be assured that your employment status or academic standing at UMB will not be affected by your decision to participate or not participate in this study. This study is independent of your professional or academic roles at UMB.

Your autonomy and well-being are of paramount importance in this study. You have the right to withdraw at any stage without any negative consequences to yourself, and any data collected prior to your withdrawal will be treated with continued confidentiality.

Your participation in this study is entirely voluntary, and your decision to withdraw will be respected and handled with professionalism and discretion.

CAN I BE REMOVED FROM THE STUDY?

The person in charge of the study or the sponsor can remove you from the study without your approval. Reasons for removal include failure to follow the instructions provided by the study team, If the study parameters change in a way that you no longer meet the eligibility criteria., non-compliance with the study requirements, such as not completing surveys or providing incomplete or inconsistent information. The sponsor can also end the study early. The study doctor will tell you about this, and you will have the chance to ask questions if this happens.

UNIVERSITY STATEMENT

The University of Maryland, Baltimore (UMB) is committed to providing subjects in its research studies all rights due to them under State and federal law. You give up none of your legal rights by signing this consent form or by participating in this study. This study has been reviewed and approved by an Institutional Review Board (IRB). The IRB is a group of scientists, physicians, experts, and community representatives. The IRB's membership includes persons who are not affiliated with UMB and persons who do not conduct research studies.

If you have questions, concerns, complaints, or believe you have been harmed through participation in this study as a result of researcher negligence, you can contact members of the IRB or the Human Research Protections Office (HRPO) to ask questions, discuss problems or concerns, obtain information, or offer input about your rights as a research study subject. The contact information for the IRB and the HRPO is:

University of Maryland, Baltimore
Institutional Review Board
Human Research Protections Office
620 W. Lexington Street, Second Floor
Baltimore, MD 21201
410-706-5037

**Entrustable Professional Activities for Graduate Physician Associates:
A Modified Delphi Study**

David J. Bunnell, MSHS, PA-C, DFAAPA
PhD candidate in Health Professions Education
University of Maryland, Baltimore

Thank you for participating in this important research. This educational document discusses my research on Entrustable Professional Activities in PA Education, with a focus on the modified Delphi process and your crucial role in it.

Definitions

Health Professions Education (HPE)

Health Professions Education is evolving towards an outcomes-based framework, focusing on learner competency achievement rather than traditional time-based paradigms. Much of this research is ongoing and your expert opinion helps us to better understand the implications for this work on education and practice. Understanding this shift is vital as we delve into the specifics of EPAs in this modified Delphi study.

Competency-Based Medical Education (CBME)

CBME is defined as “an outcomes-based approach to the design, implementation, assessment, and evaluation of HPE programs, using an organizing framework of competencies” (Frank et al., 2010a). The essence of CBME lies in setting and achieving specific learning standards for medical practice (ten Cate & Taylor, 2021).

Entrustable Professional Activities (EPAs)

An EPA is defined as “a unit of professional practice that can be fully entrusted to a trainee, once [they have] demonstrated the necessary competence to execute this activity unsupervised” (ten Cate & Taylor, 2021). Introduced in 2005, EPAs have become an integral CBME assessment method. They are described as specific, observable components of professional practice, essential for evaluating a student's competency (ten Cate, 2005).

Physician Associate (PA)

According to the American Academy of Physician Associates (AAPA), "PAs provide medical and surgical services as a member of a healthcare team, based on their education,

training, and experience. PAs exercise independent medical decision making within their scope of practice" (American Academy of Physician Associates 2024-2025 Policy Manual, 2024).

Competencies for the PA Profession

The Competencies for the PA Profession were created by a task force comprised of representatives from four national PA organizations, including the AAPA, the Accreditation Review Commission on the Education for the Physician Assistant (ARC-PA), the National Commission on Certification of Physician Assistants (NCCPA), and the PA Education Association (PAEA) and were approved by the AAPA House of Delegates in 2021

The AAPA Policy Manual (2024) states the following:

The PA professional competencies include seven competency domains that capture the breadth and complexity of modern PA practice. These are: (1) knowledge for practice, (2) interpersonal and communication skills, (3) person-centered care, (4) interprofessional collaboration, (5) professionalism and ethics, (6) practice-based learning and quality improvement, and (7) society and population health. The PA competencies reflect the well-documented need for medical practice to focus on surveillance, patient education, prevention, and population health. These revised competencies reflect the growing autonomy of PA decision-making within a team-based framework and the need for additional skills in leadership and advocacy.

EPAs in PA Education

A Past PAEA Presidents Commission previously put forth proposed EPAs, drawing from an earlier version of the Competencies for the PA Profession (Lohenry et al., 2017). This foundational work led to their call for further exploration through Delphi method research, which this study addresses.

Need for EPAs aligned with PA professional competencies.

While the PA profession has established updated competencies for new PA graduates, detailing the “specific knowledge, skills, and attitudes that PAs in all clinical specialties and settings in the United States should be able to demonstrate throughout their careers,” there remains a gap in the literature regarding what EPAs should demonstrate these competencies (AAPA Policy Manual, 2024).

Development of consensus-based EPAs for entry-level PA graduates.

This study employs a modified Delphi method to achieve a critical goal: developing a consensus among expert PA stakeholders. The objective is to create EPAs tailored for entry-level PA graduates.

Research Question

This study is driven by a fundamental research question: What Entrustable Professional Activities should entry-level PAs be trusted to perform upon graduation?

Understanding the Delphi Method

The Delphi method is a qualitative research technique. This method employs a series of questionnaires to gather expert consensus on specific topics.

But how does it work?

Let us break down the steps as outlined by Humphrey-Murto and colleagues (2017):

- Identifying the Research Problem
- Conducting a Literature Search
- Developing the Statement Questionnaire
- Distributing the Questionnaire to an Expert Panel
- Summarizing Panel Feedback
- Redistributing the Revised Questionnaire
- Compiling and Summarizing Consensus Results

A unique aspect of the Delphi method is the anonymity of the expert panel. Participants are unknown to each other, and their individual feedback remains confidential. This ensures that each expert can freely express their true opinions, uninfluenced by their peers and without the narrative being dominated by more assertive voices (Humphrey-Murto et al., 2017; Nasa et al., 2021).

General Instructions for All Rounds

Your responses will be anonymous, and data will be presented in aggregate form only. It is important to know that the responses are not anonymous to the researcher who needs to know the source of the feedback to develop personalized participant feedback in the future. Provide honest opinions based on your expertise and experience. Thoughtful and detailed responses are more valuable than quick, superficial answers.

Delphi Round 1

You will be presented with a list of EPAs derived from the literature and new EPAs created for this research. Rate each EPA based on its relevance and importance for newly graduated PAs using the provided Likert scale. Provide qualitative comments for each EPA explaining your ratings or suggestions for EPA modifications. If you believe an important EPA is missing, please suggest it along with a brief rationale. Also, if you believe an existing EPA could be improved with revisions, then offer them now.

Delphi Round 2

Examine the aggregated results and feedback from the first round, including average ratings and key comments from other participants. Based on the group feedback, re-rate the EPAs. You may adjust your previous ratings. Provide additional comments or rationale, especially if your opinion has changed. Evaluate any new EPAs suggested in Round 1 using the same Likert scale and comment section.

Delphi Round 3

You will be presented with EPAs that did not reach consensus in the previous round. Examine the group's feedback and average ratings. Give your final rating on these EPAs.

Consider both your perspective and the insights gained from the group feedback. Offer any last thoughts or rationale for your ratings, especially if you have changed your opinion since the previous round.

Implications

The findings from this study have significant implications for PA education and healthcare outcomes. By developing well-defined EPAs, we aim to elevate the standard of PA training and practice.

Questions

Please contact me with questions at dbunnell@umarlyand.edu.

APPENDIX H – Instructions for Delphi Round Participants

Instructions for Delphi Round Participants

Introduction

- **Purpose of Participation:** You are invited to participate in a Delphi study to develop consensus-based EPAs for newly graduated PAs. Your expertise in PA education and practice is crucial for the study's success.

Before Starting the Delphi Rounds

- **Understand the Delphi Method:** Familiarize yourself with the Delphi method, an iterative process involving multiple rounds of surveys to achieve consensus among experts.

Review Background Materials: Ensure you have read and understood the Competencies

for the PA Profession and any other relevant materials provided.

General Instructions for All Rounds

- **Confidentiality:** Your responses will be anonymous, and data will only be presented in aggregate.
- **Honest and Thoughtful Input:** Provide honest opinions based on your expertise and experience. Thoughtful and detailed responses are more valuable than quick, superficial answers.
- **Technical Aspects:** If you encounter any technical issues while completing the survey, please contact the research team immediately.

Specific Instructions for Each Round

Delphi Round 1

- **Review and Rate EPAs:** You will be presented with a list of EPAs derived from the literature. Rate each EPA based on its relevance and importance for newly graduated PAs using the provided Likert scale.
- **Provide Qualitative Feedback:** For each EPA, you are encouraged to provide comments, explanations for your ratings, or suggestions for modifications.
- **Suggest Additional EPAs:** If you believe an important EPA is missing, please suggest it along with a brief rationale.

Delphi Round 2

- **Review Summary of Round 1:** Examine the aggregated results and feedback from the first round, including average ratings and key comments from other participants.
- **Re-rate and Comment:** Based on the group feedback, re-rate the EPAs. You may adjust your previous ratings. Provide additional comments or rationale, especially if your opinion has changed.
- **Continued Evaluation of EPAs:** Evaluate any new EPAs suggested in Round 1 using the same Likert scale and comment section.

Delphi Round 3 (If Necessary)

- **Review Round 2 Summary:** EPAs that have not yet achieved consensus will be presented for a final opportunity to provide feedback for analysis. Examine the group's feedback and average ratings.
- **Final Ratings:** Give your final rating on these EPAs. Consider both your perspective and the insights gained from the group feedback.
- **Final Comments:** Offer any last thoughts or rationale for your ratings, especially if you have changed your opinion since the previous round.

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