

James Castiglione
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EDUCATION

University of Cincinnati College of Medicine, Cincinnati, OH 2018-2022
M.D. Anticipated
USMLE Step 1 Score: 269
Class Rank: 1st Quartile

University of Pittsburgh, Pittsburgh, PA 2010-2014
Bachelor of Science, Bioinformatics, *magna cum laude*

HONORS & AWARDS

Alpha Omega Alpha Inductee 2021

RESEARCH EXPERIENCES

Intracranial Aneurysm Morphology 2021

University of Cincinnati College of Medicine, Department of Neurosurgery
Mentor: Charles Prestigiacomo, MD

- Investigating novel morphologic measure for use in aneurysm rupture risk prediction.
- Manuscript being drafted.

Thrombectomy Outcomes 2020-2021

University of Cincinnati College of Medicine, Department of Neurosurgery
Mentor: Charles Prestigiacomo, MD

- Investigating association between mean blood glucose during admission and functional outcome after thrombectomy in posterior circulation stroke. Higher mean blood glucose during admission found to be associated with worse functional outcome when controlling for other relevant factors.
- Designed custom data collection instrument for chart review and analyzed our institution's Get with The Guidelines – Stroke dataset using logistic regression.
- Manuscript being drafted.

Deep Learning/AI for Medical Image Analysis 2019-2021

Cincinnati Children's Hospital Medical Center, Department of Radiology
Mentors: Samuel Brady, PhD; Elan Somasundaram PhD; Andrew Trout, MD

- Designed deep learning model that localizes L3 spinal level on sagittal abdominal CT scans and another model that segments skeletal muscle on the corresponding axial slices with clinical application in the diagnosis of sarcopenia.
- Developed natural language methods to apply exclusion criteria to dataset with 10,000 patients.
- Technical manuscript published and clinical manuscript being drafted.

Blunt Cerebrovascular Injury 2019-2020

University of Cincinnati College of Medicine, Department of Neurosurgery
Mentors: Charles Prestigiacomo, MD; Laura Ngwenya, MD, PhD

- Assisted with design of BCVI data collection instrument for institution's neurotrauma database and performed chart review of patients with suspected BCVI.

- Characterized BCVI in the geriatric population, finding that falls are more likely to be the mechanism of injury in geriatric patients than in adults and finding that geriatric patients more often present with higher grade injuries.

Computational Drug Discovery

2013-2014

University of Pittsburgh, Department of Computational and Systems Biology

Mentor: David Koes, PhD

- Developed software to predict ligand binding affinity based on calculating the entropy gain using grid inhomogeneous solvation theory when water molecules are displaced from a protein's binding site.
- Analyzed molecular dynamics simulations to calculate entropy using Python and C++ programming languages.

Fluid Dynamics

2011

University of Pittsburgh, Department of Physics

Mentor: Walter Goldberg, PhD

- Assisted development of methodology for measuring mean turbulent shear rate in 3D fluid flows using photon correlation spectroscopy.

PUBLICATIONS

Castiglione J, Somasundaram E, Gilligan LA, Trout AT, Brady S. Automated Segmentation of Abdominal Skeletal Muscle on Pediatric CT Scans Using Deep Learning. *Radiology: Artificial Intelligence*. 2021;3(2):e200130. doi:10.1148/ryai.2021200130

Le D, Barhorst K, **Castiglione J**, Yang G, Shah S, Harlan S, Keegan S, Jandarov R, Ngwenya L, Prestigiacomo C. Blunt cerebrovascular injury in the geriatric population. *Neurosurg Focus*. 2020;49(4):E10. doi:10.3171/2020.7.FOCUS20499

MANUSCRIPTS SUBMITTED FOR PUBLICATION

Somasundaram E, **Castiglione J**, Brady S, Trout AT. *Reference Skeletal Muscle Area and Skeletal Muscle Index Values for Healthy Pediatric Patients using a Deep Learning Pipeline*. Submitted to Radiology.

Gusler M, **Castiglione JA**, Mowla A, Grossman A, Prestigiacomo CJ, Shirani P. *Basilar Artery Recanalization by Proximal Balloon-Occlusion and Aspiration in a Single Vessel Vertebrobasilar System*. Submitted to Stroke: Vascular and Interventional Neurology.

Castiglione JA, Jalbert T, Ferguson R, Drake AW, Woodhouse C, Jandarov RA, Harness A, Smith MS, Grossman AW, Shirani P, Prestigiacomo CJ. *Glycemic Control and Outcomes Following Thrombectomy for Posterior Circulation Ischemic Stroke*. Submitted to Journal of NeuroInterventional Surgery.

ABSTRACTS & PRESENTATIONS

Somasundaram E, **Castiglione J**, Brady SL, Trout A. *Pediatric skeletal muscle index (SMI) norms for sarcopenia diagnosis using an automatic deep learning pipeline*. Oral presentation to be given at Advancing Healthcare Innovation Summit (AHIS) 2021.

Castiglione JA, Hussein A, Stahl T, Grossman AW, Shirani P, Forbes J, Andaluz N, Zuccarello M, Prestigiacomo CJ. *Aneurysm Biomorphometrics: Fractal Dimension as a Novel Predictor of Rupture Status*. University of Southern California, Department of Neurosurgery, Grand Rounds, 2021.

Castiglione JA, Hussein A, Stahl T, Grossman AW, Shirani P, Forbes J, Andaluz N, Zuccarello M, Prestigiaco C. *Aneurysm Biomorphometrics: Fractal Dimension as a Novel Predictor of Rupture Status*. University of Cincinnati, Department of Neurosurgery, Grand Rounds, 2021.

Castiglione JA, Hussein A, Stahl T, Grossman AW, Shirani P, Forbes J, Andaluz N, Zuccarello M, Prestigiaco C. *Complex Shape Morphological Analysis Through the Use of Fractal Dimension as a Predictor of Aneurysm Rupture Status*. Abstract accepted for poster presentation at Congress of Neurological Surgeons 2021 Annual Meeting.

Castiglione JA, Drake AW, Ferguson R, Jalbert T, Woodhouse C, Harness A, Jandarov RA, Grossman AW, Shirani P, Prestigiaco C. *Elevated Blood Glucose During Hospitalization Associated with Unfavorable Outcome after Mechanical Thrombectomy for Acute Ischemic Stroke*. Abstract accepted for poster presentation at Congress of Neurological Surgeons 2021 Annual Meeting.

Castiglione JA, Jalbert T, Ferguson R, Drake AW, Woodhouse C, Jandarov RA, Grossman AW, Shirani P, Prestigiaco C. *Effect of Blood Glucose Control on Outcomes after Mechanical Thrombectomy in Posterior Circulation Ischemic Stroke*. Abstract accepted for e-poster presentation at American Association of Neurological Surgeons 2021 Annual Meeting, Orlando, Florida.

Castiglione J, Somasundaram E, Gilligan L, Trout A, Brady SL. *Pipeline to automatically calculate pediatric skeletal muscle index from CT exams*. Poster presented at the Radiological Society of North America 2020 Annual Meeting, virtual.

Harlan SS, Philpott C, Droege M, Droege C, Mueller EW, Le DT, Barhorst KA, **Castiglione J**, Prestigiaco C, Ngwenya L, Keegan S. *Antiplatelet versus Anticoagulant Therapy on Resolution of Blunt Cerebrovascular Injury at Follow-up Imaging*. Poster presented at Society of Critical Care Medicine 50th Critical Care Congress, virtual.

Castiglione J, Gilligan L, Somasundaram E, Trout A, Brady S. *Automated Segmentation of Abdominal Muscle in CT Scans Using Deep Learning*. Presented poster at the Society of Pediatric Radiology 2020 Annual Meeting, virtual.

Castiglione J, Gilligan L, Somasundaram E, Trout A, Brady S. *Automated Segmentation of Abdominal Muscle in CT Scans Using Deep Learning*. Presented poster at the University of Cincinnati College of Medicine 9th Annual Research and Service Symposium, November 2019, Cincinnati, OH.

Boyarko A, **Castiglione J**, Chan K, Constand S, Haile B, Grojean M, Goldstein H, Meyer M, Patel K, Payton L, Roebker A, Zegar J. *Community Engagement to Enhance Survey Response Rates*. Presented at the annual University of Cincinnati College of Medicine Service Learning Module Symposium, April 2019.

Castiglione J, Koes D. *Ligand Affinity Prediction with Grid Inhomogeneous Solvation Theory and smina*. Presented poster at the 18th Annual International Conference on Research in Computational Molecular Biology, April 2014, Pittsburgh, PA.

Castiglione J, Koes D. *Thermodynamics of Binding Site Water Molecules*. Presented poster at the Duquesne University 2013 Summer Undergraduate Research Symposium, Pittsburgh, PA.

Stefanus S, **Castiglione J**, Cerbus R, Goldberg W. *Wall friction measurement in the absence of mean shear*. Poster presented at the American Physical Society March Meeting 2012, Boston, MA.

Castiglione J, Goldberg W. *Measuring Turbulent Shear in a Three Dimensional System*. Presented poster at the Duquesne University 2011 Summer Undergraduate Research Symposium, Pittsburgh, PA.

GRANTS & FELLOWSHIPS

- NSF TECBio Research Experience for Undergraduates** 2013
- Summer research fellowship in computational biology awarded by the National Science foundation.
- Pennsylvania Space Grant Consortium NASA Scholarship** 2011
- Summer research fellowship awarded for physics research.

EMPLOYMENT

- Epic Training Specialist**, Allegheny Health Network, Erie, PA 2018
- Trained physicians on the inpatient and outpatient EHR workflows for medicine and surgery teams.
 - Provided support to physicians using Epic in the hospital, ambulatory surgery center, and clinic after transition from paper charts to Epic during February 2018.
- Software Engineer**, 4moms, Pittsburgh, PA 2014-2016
- Led software development of smart device firmware encryption and deployment services, smart device data logging service, and of application to improve product assembly line process.
 - Assisted development of Bluetooth integration of our company's Android app to smart devices.
 - Developed applications in Python, Ruby, and Java programming languages.

EXTRACURRICULAR ACTIVITIES

- Founder, AnkiAchievements.com and Anki flashcard program software add-on** 2019-2021
- Developed a software add-on for the Anki spaced repetition flashcard program that encourages focus and efficiency while reviewing flashcards using a reward mechanism popularized in major video game titles, with a real-time, updating leaderboard hosted on AnkiAchievements.com.
 - Add-on has more than 16,000 downloads to date and more than 2300 users have registered on AnkiAchievements.com.
- Co-Chair, Neurosurgery Interest Group, AANS Chapter** 2019-2020
- Scheduled introduction to neurosurgery lecture with attending neurosurgeon.
 - Coordinated meet-and-greet with residents and attendings in the department.
 - Organized journal club and research meetings to encourage research in medical students interested in neurosurgery.
 - Led suturing and knot tying workshop along with Surgery Interest Group for M1 and M2 students.
- Treasurer, Medical Student Association** 2018-2019
- Elected treasurer for the University of Cincinnati College of Medicine Class of 2022 from 8 candidates.
 - Designed and implemented an online system to manage student organization funding, budgets, and to accept and distribute reimbursements. This system replaced an inefficient, paper-based process, saving time for the student affair's office, students, and future treasurers.
 - Managed \$55,000 Medical Student Association budget, fulfilling reimbursements and determining annual budgets for the 59 student clubs and organizations for the 2019 school year.
 - Represented the College of Medicine as a voting member on the University of Cincinnati Student Advisory Council on the University Budget (SACUB), which worked with university's VP of

Finance to draft recommendations on allocation of \$28 million university general fund. Attended bi-weekly meetings where student affairs cost centers, including the athletics department, Center for Community Engagement, and the marching band, among many others, presented their annual budget and “asks” for budget increases. SACUB would then deliberate and vote whether to include recommendation for increasing or decreasing that cost center’s annual budget in a bi-yearly memorandum to the university’s finance department.

- Successfully petitioned SACUB for recommendation for \$10,000 increase in student research travel funding for medical students, which unfortunately had to be postponed due to COVID-related budget constraints at the university.

COMMUNITY SERVICE

Student Run Free Clinic, Cincinnati OH 2021

- Provided outpatient primary care office visits to underserved patients.
- Mentored and taught clinical skills to a total of 12 different M1 and M2 students during clinic sessions.

Cincinnati + Northern Kentucky COVID19 Match 2020

- Delivered groceries to at-risk elderly during COVID pandemic

Cooking for The Family Service-Learning Project, St. Francis Seraph Ministries 2018-2019

- Cooking for The Family is a 5-week long class that teaches people in the community how to budget and prepare healthy and affordable meals.
- Developed survey and data collection instrument to analyze impact of program on participants.
- Organized potluck to bring Cooking for The Family students together to encourage survey response and for community engagement. Attended by more than 50 graduates of the program.
- Work was a component of the Physician and Society 101 and 102 courses during M1 year.

PROFESSIONAL ORGANIZATIONS

Alpha Omega Alpha 2021-Present

Congress of Neurological Surgeons 2021-Present

American Medical Association 2019-Present

American Association of Neurological Surgeons 2019-Present

HOBBIES & INTERESTS

- Programming: Fluent in Ruby, Python, JavaScript, and Java programming languages
- Powerlifting
- Electronic music and electronic music production