

CURRICULUM VITAE

Zachary Mathias NaPier, MD

13225 N Meridian ST, Carmel IN, 46032
(765) 450-0111

APPOINTMENTS

Indiana Spine Group, Carmel, IN 2023-present

- Orthopedic Spine Surgeon

Sierra Spine Institute, Roseville, CA 2020-2023

- Orthopedic Spine Surgeon

Medical Licensures

- Medical Board of Indiana Physician License: 01090729A
- Medical Board of California Physician and Surgeon License: A141988
- Federal Drug Enforcement Agency (DEA)

Professional Associations

- American Board of Orthopaedic Surgery, Board Certified
- American Academy of Orthopaedic Surgeons
- North American Spine Society
- Society for Minimally Invasive Spine Surgery

Hospital Affiliations

- Indiana Spine Hospital, Carmel, IN
- North Meridian Surgical Center, Carmel, IN
- Ascencion St. Vincent Hospital
 - Indianapolis, Carmel, and Fishers, IN
- Franciscian Health
 - Carmel and Lafayette, IN

Editorial Responsibilities

- *Current Orthopedic Practice*, reviewer, 2023-present

EDUCATION

Harvard Combined Spine Surgery Fellowship, Boston, MA 2019-2020

- Clinical fellow at Massachusetts General Hospital and Brigham and Women's Hospital

Cedars Sinai Medical Center Orthopaedic Surgery Residency, Los Angeles, CA 2014-2019

- Administrative Chief Resident (2018-2019)
- Pediatric spinal deformity rotation (6 months), Children's Hospital Los Angeles, supervising faculty: David Skaggs, Vernon Tolo, Lindsay Andras
- Cervical Spine Research Society (CSRS) 2016 Resident / Fellow Grant Award recipient for *Omega 3 Fatty Acids to Reduce Intervertebral Disc Degeneration*
- North American Spine Society (NASS) 2018 Resident / Fellow Research Award for *The Effects of Varenicline (Chantix®) on Lumbar Spinal Fusion in a Rat Model*

George Washington University School of Medicine, Washington, DC 2010-2014

- Medical Degree
- USMLE Step I Score: 256
- Orthopaedic Surgery Interest Group, Co-President
- Research Track, Medical Student Admissions Interviewer

Dartmouth College, Hanover, NH 2006-2010

- Mathematics Major
- MCAT: 37
- Varsity Golf Team
- James O. Freedman Presidential Scholar

- Alpha Delta Fraternity, Brotherhood Chair

Iolani School, Honolulu, HI

1992-2006

- High School Class Valedictorian, National Merit Finalist
- SAT: 2370/2400
- Varsity golf and soccer
- National Federation of Independent Business Young Entrepreneur's Free Enterprise Scholarship Award

Published Manuscripts

Oliker A, **NaPier Z**, Deluccia N, Qualter J, Sculli F, Smith B, Stern C, Flores R, Hazen A, McCarthy J. Step-based Cognitive Virtual Surgery Simulation: An Innovative Approach to Surgical Education. *Studies in Health Technology and Informatics*. January 2012.

Stern C, Oliker A, **NaPier Z**, Qualter J, Deluccia N, Sculli F, Long S, Rosen J, Hazen A. Integration of Surgical Simulation in Plastic Surgery Residency Training. *Studies in Health Technology and Informatics*. January 2012

Qualter J, Sculli F, Oliker A, **NaPier Z**, Lee S, Garcia J, Frenkel S, Harnk V, Triola M. The BioDigital Human: A Web-Based 3D Platform for Medical Visualization and Education. *Studies in Health Technology and Informatics*. January 2012.

Long S, Stern C, **NaPier Z**, Mandel B, Soltanian H, Bentz M, Rosen J, Hazen A. Educational Efficacy of a procedural Surgical Simulator in Plastic Surgery: A Phase I Multicenter Study. *Plastic and Reconstructive Surgery*. October 2013.

Haines C, **NaPier Z**, Roberts A, Boyle K, Yu W, O'Brien J. A Comparison of Urinary Tract and Surgical Site Infection Rates in Anterior Cervical Discectomy and Fusion with and without Urinary Catheterization. *JSM Neurosurgery & Spine*. April 2014.

NaPier Z, Kanim L, Thordarson S, Kropf M, Cuellar J, Glaeser J, Bae H. Demineralized Bone Matrix Biology and Clinical Use. *Seminars in Spine Surgery*. April 2016.

Glaeser J, Salehi K, Kanim L, Sheyn D, **NaPier Z**, Behrens P, Garcia L, Cuellar J, Bae H. Anti-Inflammatory Peptide Attenuates Edema and Promotes rhBMP-2-mediated Bone Formation in Spinal Fusion. *Tissue Engineering Part A*. May 2018.

Kang J, Glaeser J, Karamian B, Kanim L, **NaPier Z**, Koltsov J, Thio T, Salehi K, Bae H, Cheng I. The Effects of Varenicline on Lumbar Spinal Fusion in a Rat Model. *The Spine Journal*. August 2019.

NaPier Z, Kanim L, Arabi Y, Salehi K, Sears B, Perry M, Kim S, Sheyn D, Bae H, Glaeser J. Omega 3 Fatty Acids to Reduce Intervertebral Disc Degeneration. *Medical Science Monitor*. December 2019.

NaPier Z, Kanim L, Nelson T, Salehi K, Glaeser J, Sheyn D, Metzger M. The Impact of Insulin Dependent Diabetes Mellitus on Bone Metabolism and Growth after Spinal Fusion. *The Spine Journal*. November 2019.

Glaeser J, Salehi K, Kanim L, **NaPier Z**, Kropf M, Cuellar J, Perry T, Bae H, Sheyn D. NF-KB Inhibitor, NEMO-binding Domain Peptide Attenuates Intervertebral Disc Degeneration. *The Spine Journal*. May 2020.

Glaeser J, Tawackoli W, Ju D, Yang J, Kanim L, Salehi K, Yu V, Saidara E, Vit J, Khnkoyan Z, **NaPier Z**, Stone L, Bae H, Sheyn D. Optimization of a Rat Lumbar IVD Degeneration Model for Low Back Pain. *Journal of Orthopaedic Research: Spine*. June 2020.

Stephan S, Glaeser J, Tawackoli W, Kanim L, Ju D, **NaPier Z**, Bae H, Sheyn D. Optimization of a Rat Lumbar Intervertebral Disc Degeneration Model for Low Back Pain. *The Spine Journal*. September 2020.

NaPier Z. Prone Transposas Lateral Interbody Fusion (PTP LIF) with Anterior Docking: Preliminary Functional and Radiographic Outcomes. Submitted for publication. July 2023

Funded Projects

2016 -2017: Orthopaedic Research and Education Foundation / Stanford collaboration
The Effects of Varenicline (CHANTIX®) on Lumbar Spinal Fusion in a Rat Model
Role: co-Investigator

2016 – 2017: North American Spine Society (NASS)
Treatment with the NFκB Inhibitor NEMO-binding Domain Peptide to Inhibit Disc Degeneration
Role: co-Investigator

2017 – 2018: Cervical Spine Research Society (CSRS) Resident / Fellow Grant
Omega 3 Fatty Acid Supplementation to Reduce Intervertebral Disc Degeneration
Role: Principal Investigator

2017 – 2018: Medtronic, Inc. / Foundation for Spinal Restoration
BMP-2-induced Bone Formation in the Presence and Absence of Nemo Binding Domain Peptide in a Rat Spine Fusion Model
Role: co-Investigator

2017-2018: Scoliosis Research Society (SRS) Research Grant
The Impact of Type I Diabetes on Bone Metabolism and Growth after Spinal Fusion
Role: co-Investigator

Textbook Chapters

Garlich J, Moon C, **NaPier Z**, “Sacropelvic Fixation”. *Operative Techniques: Spine Surgery, 3rd Edition*. Alexander Vaccaro and Eli Baron. Textbook Chapter. 2018.

NaPier Z, Kang J, “Conflicts of Interest in Spine Surgery.” *Benzel’s Spine Surgery, 5th Edition*. Michael Steinmetz, Edward Benzel, Sigurd Berven. Textbook Chapter. 2022.

Podium Presentation

NaPier, Z. Pandemic Response: Minimizing the Effects of a Lethal Influenza-Type Virus. *Topics in Applied Mathematics: An Introduction to Complex Systems*, Hanover, NH 2010

Cyriac M, Ho A, **Napier Z**, Yu W, O'Brien J. Proximal Junctional Failure Following Posterior Spinal Fusion to the Lower Thoracic spine: the Effect of Cement Augmentation.

- a) presented at *International Meeting of Advanced Spine Techniques*, Vancouver, BC 2013
- b) presented at the *Hibbs Society, Scoliosis Research Society Annual Meeting*, Anchorage, AK 2014

NaPier Z, Kanim L, Kim S, Glaeser J, Bae H. Omega 3 Fatty Acids to Reduce Intervertebral Disc Degeneration: A Preliminary Report. *Cedars Sinai 7th Annual Orthopaedic Resident and Fellow Research Day*, Los Angeles, CA 2017

Glaeser J, Salehi K, Kanim L, **NaPier Z**, Kropf M, Cuellar J, Sheyn D, and Bae H. Treatment with the NFκB Inhibitor Reduces Overloading-induced MMP Expression in Human Nucleus Pulposus cells. *North American Spine Society Annual Meeting*, Orlando, FL 2017

Kang J, Glaeser J, Karamian B, Kanim L, Behn A, **NaPier Z**, Thio T, Salehi K, Bae H, Cheng I. The Effects of Varenicline (Chantix) on Lumbar Spinal Fusion in a Rat Model. *North American Spine Society Annual Meeting*, Los Angeles, CA 2018

Glaeser J, Behrens P, Salehi K, Kanim L, Sheyn D, **NaPier Z**, Cuellar J, Bae H. NF-κB Inhibitor Suppresses Edema and Promotes rhBMP-2-mediated Bone Formation in Spinal Fusion. *Scoliosis Research Society Annual Meeting*, Bologna, Italy 2018

NaPier Z, Kanim L, Arabi Y, Salehi K, Kim S, Sheyn D, Bae H, Glaeser J. Omega 3 Fatty Acid Supplementation to Reduce Intervertebral Disc Degeneration. *Cervical Spine Research Society Annual Meeting*, Phoenix, AZ 2018.

Napier Z, Kanim L, Nelson T, Salehi K, Arabi Y, Glaeser J, Sheyn D, Metzger M. The Effect of Insulin Dependent Diabetes on Bone Metabolism and Growth after Spinal Fusion. *Cedars Sinai 7th Annual Orthopaedic Resident and Fellow Research Day*. Los Angeles, CA 2019

Stephan S, Glaeser J, Tawackoli W, Ju D, Yang J, Kanim L, Salehi K, Yu V, Khnkouyan Z, **NaPier Z**, Bae H, Sheyn D. Optimization of a Disc Degeneration Model in the Rat Lumbar Spine.

a) presented at *Spine Summit*, Las Vegas, NV 2020

b) presented at *North American Spine Society Annual Meeting*, virtual, 2020

NaPier Z. Prone Transpoas (PTP) Lateral Interbody Fusion: Tips and Tricks for Successful Adoption. *Seattle Science Foundation S.T.E.D. Online Lecture Series*. Seattle, WA 2023.
<https://www.youtube.com/watch?v=GbihDDRadOM&t=5s>

NaPier, Z. Prone Transpoas (PTP) for Spinal Deformity. *Alphatec Spine Prone Transpoas Summit*. Carlsbad, CA 2023.

Poster Presentation

Qualter J, Sculli F, Olikier A, **NaPier Z**, Lee S, Garcia J, Frenkel S, Harnk V, Triola M. The BioDigital Human: A Web-based 3D Platform for Medical Visualization and Education. *Medicine Meets Virtual Reality 19 / Nextmed*, Newport Beach, CA 2012

Long S, Stern C, **NaPier Z**, Rosen J, Soltanian H, Bentz M. Educational Efficacy of a Procedural Surgical Simulator in Plastic Surgery Residency Training : A Phase I Multi-Site Study. *Plastic Surgery: The Meeting*. San Diego, CA 2013

NaPier Z, Kanim L, Kim S, Bae H, Glaeser J. Omega 3 Fatty Acids to Reduce Intervertebral Disc Degeneration. *Orthopaedic Research Society Southern California Regional Symposium: Orthopaedic Research: From Mechanism to Mechanics*. Los Angeles, CA 2017

Glaeser J, Salehi K, Kanim L, **NaPier Z**, Garcia L, Sheyn D, Cuellar J, Bae H. NEMO-binding Domain Peptide Suppresses rhBMP-2-induced Soft-tissue Inflammation in Rat.

a) *Orthopaedic Research Society Southern California Regional Symposium: Orthopaedic Research: From Mechanism to Mechanics*. Los Angeles, CA 2017

b) *Orthopaedic Research Society Annual Meeting*. New Orleans, LA 2018

Glaeser J, Salehi K, Kanim L, **NaPier Z**, Kropf M, Cuellar J, Perry T, Sheyn D, Bae H. Treatment with NEMO Binding Domain Peptide Reduces Loading-induced MMP Expression in Human Nucleus Pulposus Cells.

a) *Orthopaedic Research Society Southern California Regional Symposium: Orthopaedic Research: From Mechanism to Mechanics*. Los Angeles, CA 2017

b) *Orthopaedic Research Society Annual Meeting*. New Orleans, LA 2018

Glaeser J, Behrens P, Salehi K, Kanim L, Sheyn D, **NaPier Z**, Cuellar J, Bae H. NF- κ B Inhibitor Suppresses Edema and Promotes rhBMP-2-mediated Bone Formation in Spinal Fusion. *North American Spine Society Annual Meeting*, Los Angeles, CA 2018

Glaeser J, Tawackoli W, Ju D, Yang J, Kanim L, Salehi K, Yu V, Khnkoyan Z, **NaPier Z**, Bae H, Sheyn D. Optimization of Disc Degeneration Model in Rat Lumbar Spine. *Orthopaedic Research Society Annual Meeting*. Phoenix, Arizona, 2020.

ACTIVITIES, LEADERSHIP, AND SERVICE

Global Spine Outreach, Monterrey, Nuevo Leon, Mexico

Sept 2018

Volunteer Surgeon, program Co-Chairmen Anthony Rinella, MD and Gregory Mundis, MD

- Assist with evaluation of 60-80 children with spinal deformities and surgical treatment of 15-20 of these children
- Participate in Spine Symposium at Christus Muguerza Hospital

GWU SMHS Orthopaedic Surgery Interest Group, Washington, DC

Aug 2011-Aug 2012

Co-President

- Host meetings and facilitate interaction between students and faculty interested in orthopaedic surgery
- Assist with organization of Ortho-Lift Fundraiser benefitting the Muscular Dystrophy Association

BioDigital Systems, New York, NY

June-August 2011

Intern, funded by Gill Fellowship

- Assist product development team in optimizing BioDigital Human platform for medical education
- Integrate medical data with BioDigital Human and assist in designing content

Tissue Engineering & Organ Fabrication Laboratory at Harvard Medical School

June-August 2009

Research Assistant to Dr. Cathryn Sundback and Dr. Joseph Vacanti

- Conduct laboratory experiments designed to regenerate muscle tissue for reconstructive applications
- Assist muscle, nerve, and biomaterial teams in various capacities

Thayer School of Engineering at Dartmouth

March 2009-June 2010

Teaching Assistant, Healthcare and Biotechnology in the 21st Century

- Assist students in writing research papers, grade research papers, assist in writing and grading examinations.
- Coordinate activities and host expert guest lecturers from various fields related to healthcare and biotechnology.
- Academic citation for excellence as a teaching assistant

Dickey Center for International Understanding

Dec 2008

Researcher, funded by Global Health Initiative

- Determine feasibility of telemedicine based healthcare network using iPhone platform in Hanoi, Vietnam
- Travel to rural and communal clinics to interview professionals and gather data regarding Vietnamese healthcare system

James O. Freedman Presidential Scholars Program

Mar 2008-June 2009

Research Assistant to Dr. Joseph Rosen

- Research existing literature and synthesize new doctrine regarding the implementation of Cybercare, a revolutionary, network based healthcare system to be presented to the Obama Administration.
- Travel to Hanoi, Vietnam to meet with executives at National Hospital of Pediatrics (NHP) to organize a surgical trip and plastic surgery conference for Dr. Rosen and colleagues
- Shadow physicians and observe surgical procedures at NHP

Special Olympics of New Hampshire, West Lebanon, NH

Jan 2007-June 2010

Golf Clinic Founder and Head Coach

- Hit golf balls and play miniature golf with special needs athletes at Fore-U Golf Center
- Help athletes develop athletic, communication, and etiquette skills

Bowling Team Volunteer Coach

- Weekly practice sessions in preparation for seasonal competitions

Competitive Golf

March 2005-October 2008

- Dartmouth Men's Varsity Golf Team, NCAA Division I (2006-2008)
 - Compete in ten national tournaments during fall and spring
 - Practice up to 25 hours a week as a team
- USGA Handicap Index: 2.9, Low round of 66 (5 under par) at Ted Makalena Golf Course, Honolulu, HI
- Low competitive round 68 (2 under par) at 2006 U.S. Public Links local qualifier, Ala Wai Golf Course, Honolulu, HI
- DC Golf Tour Two-Person Team Tournament Series, First Place—Championship Flight, 1757 Golf Club, Dulles, VA, May 2013, First Place—Championship Flight, PB Dye Golf Club Scramble, Ijamsville, MD, September 2013

Kaiser Permanente Medical Center, Moanalua, HI

June-August 2007

Emergency Room Volunteer Assistant

- Transport patients for CT and MRI scans, answer telephones, address basic needs of patients, provide sanitary treatment conditions
- Shadow emergency room physicians and observe surgical and diagnostic procedures

Hanu Surgical Devices, LLC, *Research Assistant*, Honolulu, HI

May 2005-2010

- Assist in development of expandable endotracheal tubes for high risk airways
- Promote proprietary Rapid Oral Tracheal Intubation Guidance System (ROTIGS), FDA approved, US and European patents pending, www.rotigs.com