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CONCETTA F. MORINO, Ph.D.
STAFF CONSULTANT

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Dr. Concetta Morino is a mechanical and biomedical engineer at Engineering Systems Inc. (ESi) in the North Carolina office. Dr. Morino has related expertise in mild to severe lumbar spine injury, injury risk development, risk analysis, statistical analysis, injury detection, and biomechanical experimental testing (cadaver, anthropometric test device, animal).

Prior to joining the team at ESi, Dr. Morino earned her Ph.D. in Mechanical Engineering and Materials Science and a M.S. in Biomedical Engineering from Duke University while conducting research in the Injury Biomechanics Laboratory. Her dissertation research focused on lumbar spine injury due to repeated loading, lumbar spine injury detection, and characterization of lumbar spine mechanical properties. She also has extensive research experience in a wide breadth of injury biomechanics topics including mild traumatic brain injury (mTBI), behind armor blunt trauma (BABT), underbody blast (UBB), and diagnostic imaging.

Dr. Morino has presented her research at international conferences and is published in peer-reviewed scientific journals and conference proceedings, including *Annals of Biomedical Engineering* and *International Research Council on Biomechanics of Injury.*

Areas of Specialization

Impact Biomechanics	Human Injury Analysis	Lumbar Spine Injury
Injury Mechanisms	Failure Analysis	Fatigue Loading
Injury Causation	Material Property Characterization	Statistical Analysis
Experimental Testing	Biomedical Instrumentation	High-Rate Loading
Diagnostic Imaging	Blast Biomechanics	Concussion

Education

Ph.D., Mechanical Engineering and Materials Science, Duke University, 2024
M.S., Biomedical Engineering, Duke University, 2024
B.S., Mechanical Engineering, Ohio State University, 2019

Positions Held

Engineering Systems Inc., Charlotte, North Carolina
Staff Consultant, 2024 – Present

Duke University, Durham, North Carolina
Graduate Research Engineer, Injury Biomechanics Laboratory, 2019 – 2024

Dynamix Engineering Ltd, Columbus, Ohio
Mechanical Engineering Intern, 2018 – 2019

Johnson & Johnson's Ethicon Endo-surgery, Cincinnati, OH
Robotics R&D Co-op, 2017

Professional Affiliations & Honors

Professional Affiliations

Biomedical Engineering Society (BMES), Member

Honors and Awards

Burroughs Wellcome Fund Fellowship
International Research Council on Biomechanics of Injury
- Best Presentation in Tissue Mechanics, 2023
- Best Presentation in Methodology, 2022
- Travel Grant, 2023
- Travel Grant, 2022

World Congress of Biomechanics
- Pre-doctoral Award Semi-finalist, 2022

Injury Biomechanics Symposium
- Travel Grant, 2023
- Best Presentation Finalist, 2022
- Travel Grant, 2022

Biomedical Engineering Society Conference
- Travel Grant, 2023

Classroom Teaching Experience

Blast and Ballistics
Biomechanics of Neurotrauma

Publications/Presentations

Journal Publications

1. **Morino CF**, Schmidt AL, Dimbath E, Middleton ST, Kait JR, Shridharani JK, Ortiz-Paparoni MA, Klinger J, Op ‘t Eynde J, Bass CR. Human and Porcine Lumbar Endplate Injury Risk in Repeated Flexion-Compression. *Annals of Biomedical Engineering,* 2024. (in review)

2. **Morino CF**, Middleton ST, Dimbath E, Op ‘t Eynde J, Kait JR, Luck JF, Bass CR. Primary Creep Characterization in the Porcine Lumbar Spine Experiencing Combined Flexion and Compression Loading. *Annals of Biomedical Engineering,* 2024. (in review)

3. **Morino CF**, Kait JR, Bass CR. Hydration State Throughout Porcine Lumbar Intervertebral Discs: Comparing Fresh and Frozen-thawed Specimens. *Annals of Biomedical Engineering,* 2024. (in review)

4. Dimbath E, **Morino CF**, Middleton ST, Kait JR, Ortiz-Paparoni MA, Slotkin TA, Luck JF, Bass CR. Cyclic Mechanism Affects Spinal Mechanical Response: A Study on Differences in Creep Response and Their Implications For Injury Risk. *Annals of Biomedical Engineering,* 2024. (in review)

5. Ortiz-Paparoni MA, Op ‘t Eynde J, Eckersley CP, **Morino CF**, Abrams MZ, Pang DY, Kait JR, Pintar FA, Yoganandan N, Moore J, Barnes D, Loftis K, Bass CR. Expanded Combined Loading Injury Criterion for the Human Lumbar Spine Under Dynamic Compression. *Annals of Biomedical Engineering,* 2024. (in review)

6. Ortiz-Paparoni MA, **Morino CF**, Bercaw J, Op ‘t Eynde J, Nightingale R, Bass CR. Translating Cadaveric Injury Risk to Dummy Injury Risk at Iso-energy. *Annals of Biomedical Engineering,* 2023.

7. Ortiz-Paparoni MA, Op ‘t Eynde J, Kait JR, Bigler BR, Shridharani JK, Schmidt AL, Cox CA, **Morino CF**, Pintar FA, Yoganandan N, Moore J, Zhang J, Bass CR. The Human Lumbar Spine During High-Rate Under Seat Loading: A Combined Metric Injury Criteria. *Annals of Biomedical Engineering,* 2021.

Refereed Conference Publications

1. **Morino CF**, Schmidt AL, Dimbath E, Middleton ST, Kait JR, Shridharani JK, Ortiz-Paparoni MA, Klinger J, Op ‘t Eynde J, Bass CR. Human and Porcine Lumbar Endplate Injury Risk in Repeated Flexion-Compression. *International Research Council on Biomechanics of Injury 2023.*

2. **Morino CF**, Middleton ST, Dimbath E, Op ‘t Eynde J, Kait JR, Bass CR. Primary Creep Characterization in the Porcine Lumbar Spine Experiencing Combined Flexion and Compression Loading. *International Research Council on Biomechanics of Injury 2023.*

3. Ortiz-Paparoni MA, **Morino CF**, Op ‘t Eynde J, Kait JR, Bass CR. Translating Cadaveric Injury Risk to Dummy Injury Risk at Iso-energy. *International Research Council on Biomechanics of Injury 2022.*

Conference Presentations and Abstracts

1. Middleton ST, **Morino CF**, Schmidt AL, Op ‘t Eynde J, Dimbath E, Shridharani JK, Ortiz-Paparoni MA, Klinger J, Luck JF, Bass CR. (2024, February 2-6) “Comparing Human and Porcine Lumbar Spinal Unit Primary Creep in Combined Loading with a Viscoelastic Model.” *Orthopaedic Research Society,* Long Beach, California.

2. **Morino CF**, Schmidt AL, Dimbath E, Middleton ST, Kait JR, Shridharani JK, Ortiz-Paparoni MA, Klinger J, Op‘t Eynde J, Bass CR. (2023, October 11-14) “Human and porcine lumbar endplate injury risk in repeated flexion-compression.” *Biomedical Engineering Society Annual Meeting*, Seattle, Washington.

3. Ortiz-Paparoni MA, Op ‘t Eynde J, **Morino CF**, Dimbath E, Bigler BR, Cox CA, Shridharani JK, Schmidt AL, Kait JR, Bass CR. (2023, October 11-14) “Effects of Flexion/Extension on the Axial Compression Tolerance of the Human Lumbar Spine During Dynamic Compression.” *Biomedical Engineering Society Annual Meeting*, Seattle, Washington.

4. Dimbath E, **Morino CF**, Middleton ST, Kait JR, Ortiz-Paparoni MA, Bass CR. (2023, October 11-14) “Role of Cyclic Loading in Porcine Lumbar Intervertebral Disc Behavior: A Preliminary Study.” *Biomedical Engineering Society Annual Meeting*, Seattle, Washington.

5. Middleton ST, **Morino CF**, Dimbath E, Kait JR, Op ‘t Eynde J, Klinger J, Bass CR. (2023, October 11-14) “Quasilinear Viscoelastic Creep Model for Lumbar Soft Tissue Primary Creep Subject to Combined Loading.” *Biomedical Engineering Society Annual Meeting*, Seattle, Washington.

6. **Morino CF**, Schmidt AL, Dimbath E, Middleton ST, Kait JR, Shridharani JK, Ortiz-Paparoni MA, Klinger J, Op‘t Eynde J, Bass CR. (2023, September 13-15) “Human and porcine lumbar endplate injury risk in repeated flexion-compression”. *International Research Council on Biomechanics of Injury*, Cambridge, England.

7. **Morino CF**, Middleton ST, Dimbath E, Op‘t Eynde J, Kait JR, Bass CR. (2023, September 13-15) “Modelling viscoelastic creep response of porcine lumbar spinal units exposed to repeated flexion-compression loading.” *International Research Council on Biomechanics of Injury*, Cambridge, England.

8. Dimbath E, **Morino CF**, Middleton ST, Kait JR, Bass CR. (2023, September 13-15) “Lumbar Response to Flexion-Compression in Cyclic and Quasi-static Loading in Intervertebral Discs.” *International Research Council on Biomechanics of Injury*, Cambridge, England.

9. **Morino CF**, Dimbath E, Middleton ST, Kait JR, Ortiz-Paparoni MA, Bentley TB, Shender BS, Bass CR. (2023, August 14-17) “Identifying Incipient Injury in Porcine Lumbar Intervertebral Disc from Prolonged Flexion-Compression Loading.” *Military Health System Research Symposium*, Kissimmee, Florida.

10. **Morino CF**, Dimbath E, Middleton ST, Kait J, Ortiz-Paparoni MA, Bass CR. (2023, May 22-23) “Identifying incipient injury from flexion-compression loading of porcine lumbar intervertebral disc.” *Ohio State Injury Biomechanics Symposium*, Columbus, Ohio.

11. Ortiz-Paparoni MA, **Morino CF**, Op ‘t Eynde J, Kait JR, Bass CR. (2022, September 14-16) “Translating Injury Metrics from Cadaver to Test Surrogate Using an Iso-energy Approach.” *International Research Council on Biomechanics of Injury*, Porto, Portugal.

12. Ortiz-Paparoni MA, **Morino CF**, Op ‘t Eynde J, Kait JR, Bass CR. (2022, July 10-14) “Translating Injury Metrics from Cadaver to Test Surrogate Using an Iso-energy Approach.” *World Congress of Biomechanics*, Taipei, Taiwan (virtual).

13. **Morino CF**, Ortiz-Paparoni MA, Op ‘t Eynde J, Kait JR, Abrams MA, Pintar FA, Yoganandan N, Moore J, Loftis KL, Barnes DR, Bass CR. (2022, May 23-24) “Expanded Combined Lumbar Injury Criterion Due to Underbody Blast.” *Ohio State Injury Biomechanics Symposium*, Columbus, Ohio.

14. Schmidt AL, **Morino CF**, Shridharani JK, Op ‘t Eynde J, Kait JR, Ortiz-Paparoni MA, Shender BS, Bentley TB, Bass CR. (2022, September 12-16) “Long-term lumbar spine loading flexion/compression injury and response.” *Military Health System Research Symposium*, Kissimmee FL, United States.

15. Op ‘t Eynde J, Pang DY, **Morino CF**, Abrams MZ, Kait JR, Salzar RS, Bentley TB, Shender BS, Bass CR. (2022, September 12-16) “The Severe Limitations of Clay for Assessing Human Response for Behind Armour Blunt Trauma.” *Military Health System Research Symposium*, Kissimmee FL, United States.