Internship testimonial (1)

Amateur running speed and all-cause mortality

The Radboudumc's Department of Physiology* was the host institution for my research internship there. My research in this area focused on determining whether or not there is a correlation between running speed and overall mortality in amateur runners. It was a large-scale study that included quite a few participants. While working with a very enthusiastic and professional team, it was a lot of fun to learn new research skills such as R and Python, as well as advanced critical thinking. Aside from that, I found that working with real data and trying to find an answer to my research question was an interesting experience.

This department is now called the Department of Medical BioSciences as a fusion with 4 other departments (Bio-chemistry, Cell Biology, CMBI (Center for Molecular and Bio-molecular Informatics), and Tumor Immunology).

Dept. of Physiology*
Radboudumc
Nijmegen, the Netherlands

Internship testimonial (2)

Gait analysis of patients with ankle-foot orthoses

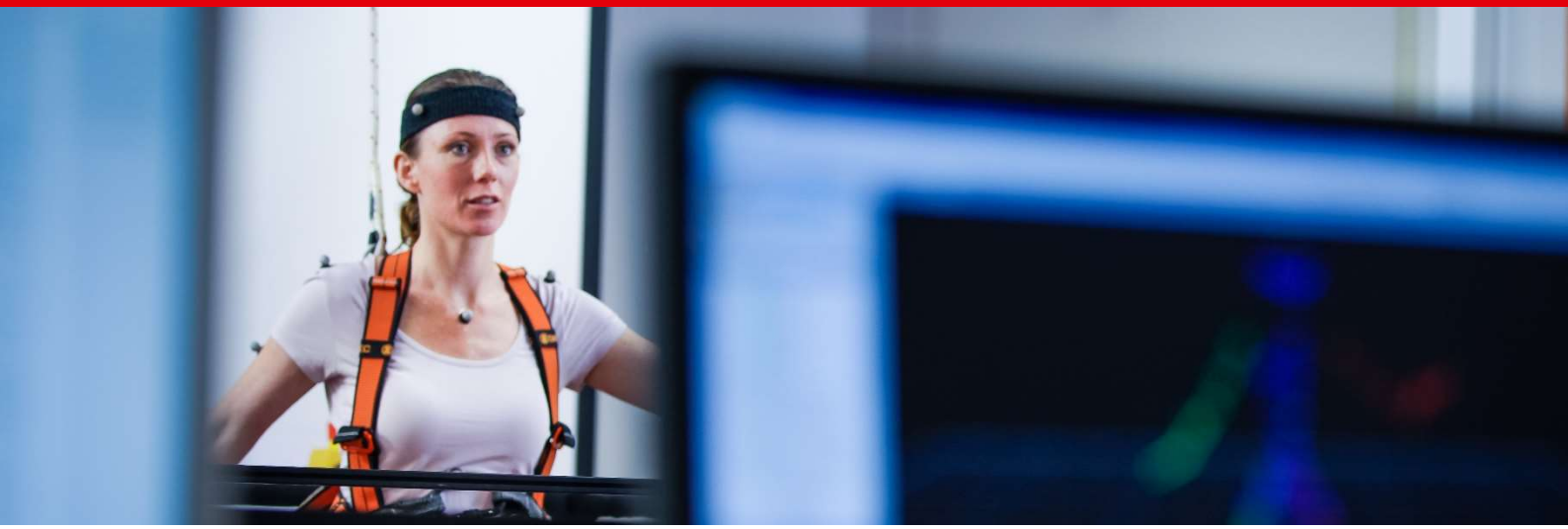
My internship took place at the Sint Maartenskliniek in the department that is responsible for research and innovation. The internship focused on performing gait analysis on patients while they wore ankle-foot orthoses. During my internship, I was able to improve my scientific writing and contribute to the measurement of patients. When it came to formulating my own research question and strategies, I had a lot of freedom to work with. At any given time during the course of my internship at the Sint Maartenskliniek, a number of students represented a wide range of educational backgrounds and professional pursuits, and thus I really liked the diversity.

Sint Maartenskliniek

Dept. of Research and Innovation
St. Maartenskliniek
Nijmegen, the Netherlands

Specialisation – Master's in Biomedical Sciences

Clinical Human Movement Sciences



Explore different aspects of movement sciences with a clinical perspective, ranging from orthopaedic biomechanics to neural control and movement disorders

The BMS Master's has seven specialisations to choose from. Each specialisation contains a number of courses that reflect its central topics and methodology. Clinical Human Movement Sciences is a field that explores the many facets of human movement and its impact on health and rehabilitation. Drawing on multiple disciplines such as physiology, anatomy, biomechanics, orthopaedics, neurosciences, and rehabilitation, CHMS aims to keep patients active and healthy for as long as possible. With a strong patient-centered approach, CHMS emphasizes the importance of physical activity as the best medicine for most patients.

Specialisation Coordinator

Prof. Dr. Esther Tanck

Dept. of Orthopedics at Radboudumc

Esther.tanck@radboudumc.nl

Deputy Specialisation Coordinator

Dr. Florieke Eggermont

Dept. of Orthopedics at Radboudumc

Florieke.eggermont@radoudumc.nl

Radboud University

Radboudumc university medical center

Courses within this specialization (1/2)

W36 = September, W40 = October, W44 = November,
A = Monday/Tuesday contact hours, time for self study or exam (final week) on Wednesdays,
B = Thursday/Friday contact hours, time for self study on Wednesdays.

Period	Code	Course
W36-A	MED-BMS53	**Orthopaedic biomechanics in motion**

This course explores orthopaedic biomechanics, a vital aspect of human movement sciences, focusing on bones, joints, tendons, and more, and how they handle external and internal forces. Students will delve into deformation during loading and factors affecting tissue strength. The curriculum encompasses mechanical experiments, computer simulations, and predictions related to the musculoskeletal system. Course activities include computer simulations to assess femur strength, functional tests post anterior cruciate ligament reconstruction, and kinematic measurements pre and post total knee replacement in an experimental surgical context.

Period	Code	Course
W36-B	MED-BMS54	**Applied exercise physiology**

This course explores thermoregulation and cardiac adaptations in athletes, spanning four weeks. The initial half emphasizes thermophysiology, elucidating the nervous system, cardiovascular system, and skin's role in temperature regulation during exercise, along with heat-related illnesses and core body temperature measurement techniques. The latter half delves into the impact of high-volume, high-intensity exercise on cardiac remodeling, highlighting potential risks to heart health in the context of growing participation in extreme endurance training. Suitable for amateur and elite athletes, it offers comprehensive insights into athletic physiology.

Period	Code	Course
W40-A	MED-BMS55	**From vascular function to vascular failure**

This course offers comprehensive insight into atherosclerosis, a critical factor in cardiovascular disease, the world's leading cause of death. Students start by delving into the cardioprotective effects of exercise and its impact on blood flow and arterial remodeling. Then students learn about atherosclerosis in large and small vessels, considering factors like sex and drugs. State-of-the-art techniques relevant to vascular health are explored. Lastly, students focus on responding to reviewer comments in the scientific publishing proces. Practical experience in cutting-edge research facilities and exposure to clinical departments enrich this course, culminating in the design and presentation of a research project.

Courses within this specialization (2/2)

Period	Code	Course
W40-B	MED-BMS50	**Neural control of movement**

This course delves into neural control of movement and posture, dissecting brainstem and spinal cord circuits governing reflexes and complex motor actions. It's essential for grasping normal behavior and neurological disorders. The syllabus addresses conditions such as Parkinson's, Huntington's, and ALS, frequently rooted in motor system dysfunction. The curriculum starts with lower motor neuron circuits, reflexes, neuromuscular problems, and clinical EMG techniques, progressing to upper motor neuron control, basal ganglia, and cerebellum modulation. It provides students with a holistic grasp of human motor control, unifying foundational and clinical neuroscience perspectives.

Period	Code	Course
W44-A	MED-BMS49	**Movement science in rehabilitation**

This course aims to equip students with a foundational understanding of motor control and recovery in neurological and orthopaedic patients. It emphasizes critical analysis of impairments and compensatory mechanisms, utilizing tools like 3D motion capture and EMG for clinical problem-solving. Areas of focus include balance control, walking, and manipulation. Students will gain the ability to formulate relevant research questions and systematically evaluate patient issues in clinical or movement-laboratory settings, with practical application in real patient cases, fostering both clinical and scientific competence.

Period	Code	Course
W44-B	MED-BMS52	**Disorders of movement**

This course offers an integrated approach to understanding neurodegenerative and neuromuscular movement disorders. It explores the overlap in molecular mechanisms, clinical symptoms, and treatment approaches across various disorders. Topics include common disorders like Parkinson's disease, rare genetic disorders, and neuromuscular conditions such as myopathies and muscular dystrophies. The course aims to provide a comprehensive perspective on these disorders at the molecular, symptomatic, and treatment levels, shedding light on both their heterogeneities and commonalities.