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"The Faculty Member has Initiated Ongoing Collaboration with UAH Athletics, Primarily in IRB Approved Research Studies Involving the Hockey Team"

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RCEU History: I have no previous RCEU history

Project Summary

The faculty mentor has initiated ongoing collaboration with UAH athletics, primarily in IRB approved research studies involving the UAH Hockey team. Research studies this summer aim to continue building the foundation of collaborative work between the Department of Kinesiology and the Department of Athletics at UAH. The main focus of summer research efforts will be focused on the utilization of electromyography (EMG) and motion analysis of the lower extremity during various skating positions. Overuse injuries and fatigue related to lower extremity musculature are common in hockey players. It is theorized injuries and fatigue are exacerbated by improper biomechanical positioning during the skating stride, resulting in muscular activity imbalance. In a dryland setting, hockey players will be asked to replicate their skating position while on a stride board. Muscle activity patterns of the lower extremity musculature will be analyzed with EMG sensors. Motion analysis via electrogoniometers will provide an assessment of joint angles during the activity. Following self-selected positioning, players will be asked to perform the stride board task while in a more optimal skating position that aligns the angle of the torso with the angle of the lower leg. While altering a player's desired positioning while skating is not desired as part of this study, it is believed that having the ability to compare EMG patterns and joint angles across varying stride positions will allow for information to be provided to coaches and trainers that work within the sport with the overall goal of reducing injury occurrence.

Additionally, the study will look at various strength values associated with the lower extremity. These values will be measured on an isokinetic dynamometer and provide a further understanding to the biomechanical preferences of the athlete and allow for insight into potential strength imbalances that may be a risk factor for injury. Students will be expected to have hands-on experience drafting research-related documentation, preparing the subjects for data collection, collecting data, and analyzing the results. The experience of interacting with research participants will be invaluable regardless of their chosen field beyond UAH and students will gain access and familiarity to equipment that is vital in any exercise science-related discipline.

Student Prerequisites

No course work prerequisites are needed, but the individual should be in either junior- or senior-level standing.

Student Duties

The student will be expected to work closely with the faculty mentor to perform the following duties in the exercise physiology laboratory:

- Preparation of study documents, subject recruitment, and testing coordination
- Maintenance, calibration, and utilization of neuromuscular and biomechanical equipment
- Conducting familiarization and data collection sessions with the strength equipment
- Analysis of results related to the study

The student will be expected to work closely with the faculty mentor to perform the following duties in the UAH Strength and Conditioning Weight Room in Spragins Hall:

- Measuring muscle activity patterns utilizing EMG software
- Utilizing electrogoniometers to analyze joint angles during the activity
- Coordinating future testing sessions with the research participants and coaching staff

The primary benefits to the students are:

- Hands-on learning with various laboratory techniques involved in human performance testing
- Opportunity to grasp the research process, from hypothesis generation to data collection, ultimately ending with a dissemination of findings
- Opportunity to contribute to a manuscript submission in a reputable journal or conference proceedings, depending on the progress of the study

Mentor Supervision and Interaction

The faculty mentor will provide the daily supervision to the student. In addition, the student is expected to update the mentor with a weekly progress report and during bi-weekly meetings. The following items are specific expectations related to faculty supervision and interaction:

- Weekly progress report
 - o Written together with the student to monitor progress of the program
 - o Discuss ongoing efforts related to the study and other research-related tasks, highlight any current issues, and establish plans for the following week
 - o Evaluation: the faculty mentor will provide feedback for each report. The faculty mentor will assess and provide feedback on the writing, scientific progress, and quality of work.
- Bi-weekly progress update meetings with the student
 - o Discuss current data, analysis of results, and actions to correct any issues that arise
 - o Frequency of the meetings will be increased as needed throughout the summer
 - o Evaluation: the faculty mentor will provide detailed instruction for the ongoing work and offer suggestions for improvement