

"I believe that physiology research and biomedical engineering need to be combined to create new technologies that improve patient diagnostics and treatments."



Foster's research is focused on understanding how the body controls breathing and the circulation in response to reduced oxygen supply and exercise.

Using a range of techniques, Foster studies healthy individuals and those with chronic disease

The ability to sense and respond to reduced oxygen supply is critical for human survival.

Without oxygen, your brain, heart, liver and other organs can be damaged in minutes. For this reason, humans have developed oxygen-sensing mechanisms to maintain a stable equilibrium between the body's organ systems, as well as ways to adapt to chronically low blood oxygen levels such as occurs when travelling to high altitude or with repeated short-term exposure to low blood oxygen such as occurs in sleep apnea. Although adaptations are normally positive, some human adaptations have a negative consequence on human health. For example, each night approximately 5.4 million Canadian adults experience sleep apnea. Sleep apnea is a condition where breathing repeatedly stops and starts during sleep resulting in rapid and repeated exposure to low levels of blood oxygen. A single bout of sleep apnea can impact how the human body controls the circulation, while several years of sleep apnea is associated with cardiovascular disease. Whether it is atop a mountain or simply going to sleep at night, Dr. Foster's research is generating a greater understanding of how our body controls breathing and its circulation, and is developing novel methodology to improve diagnostics and treatments.

Main Research Focus:

1. Effect of sleep apnea and repeated low oxygen exposure on breathing and the circulation.
2. Contrast ultrasound imaging to measure blood flow through the lungs, heart, and muscle.
3. Coronary blood flow regulation in the high-altitude environment.



GLEN FOSTER

About

Dr. Foster's interest for physiological research began in the last year of his undergraduate degree when he was first exposed to a research setting. Then, he was hooked. Dr. Foster completed his Masters in Kinesiology at UBC Vancouver and his PhD in the Faculty of Medicine at the University of Calgary. Before being recruited to UBC's Okanagan campus, Dr. Foster completed a post-doctoral fellow at UBC Vancouver. The driving force behind much of his work was understanding how the intensity and frequency of low-oxygen exposure affect the human body. A force that continues to drive his current work in the Cardiopulmonary Laboratory for Experimental and Applied Physiology. As Director of the lab, Dr. Foster oversees infrastructure that takes his research to new heights. Sometimes literally, as Dr. Foster and team travel have travelled to high altitude areas such as Everest basecamp in the Himalayas and White Mountain in the Sierra Nevada Mountains to complete studies in low-oxygen conditions.

Research Environment

As head of the Cardiopulmonary Laboratory for Experimental and Applied Physiology, Dr. Foster works with a group of dedicated graduate students who are keenly interested in human integrative physiology. Students develop strong data science skills, help design and advance new methodologies, and acquire a new appreciation for studying the integration of human organ systems. Dr. Foster's lab contains a wide range of tools and technologies permitting the simultaneous study of multiple integrated organ systems.

Next Stages

Dr. Foster is working with community partners to investigate new diagnostic techniques and novel treatment approaches. His collaborations with biomedical engineering expertise aim to develop new approaches for quantifying blood flow through vessels of the lung, heart, and muscle. While collaborations with physician scientists foster's a new approach to treating cardiovascular disease in patients suffering from sleep apnea.



FEATURED PROJECT

The Physiological Response to Sleep Apnea Starts on Day 1

Sleep apnea is a condition which can result in frequent periods of decreased oxygen levels in the body, known as intermittent hypoxia. In Dr. Foster's recent study, he measured the impact of simulated sleep apnea on humans, and found that just six hours of the fluctuating oxygen levels associated with sleep apnea can begin to deteriorate a person's circulatory system.

The study simulated sleep apnea in 10 healthy young adults and found that in just six hours, blood pressure was increased and damaging blood flow patterns were observed. The findings will inform future interventions to improve how sleep apnea is treated.

TO LEARN MORE:

Glen Foster

glen.foster@ubc.ca

250 807 8224



Visit hes.ok.ubc.ca



THE UNIVERSITY OF BRITISH COLUMBIA

School of Health and Exercise Sciences

Faculty of Health and Social Development
Okanagan Campus