Abstract
Ten peripheral nervous system labs are available for teaching a three-hour laboratory course for one or two credits. For this peripheral nervous system course, Data Basics are covered in a single Accelerometry lab. Basic Physiology is taught in three labs: Biopotentials Basics, Electrophysiology I and II, and Electrocardiography. Each of these labs are available at no cost to the student. Cleveland Medical Devices Inc., Cleveland, OH. The laboratory course may be designed to cover either one or two hours, depending on the number of students taking the course.

Methods
This laboratory course is designed to teach students to record and analyze the electrophysiological signals of the peripheral nervous system. This laboratory course utilizes the BioRadio® 150, a lightweight, wireless physiological monitor with 12 physiology channels (Figure 1). The BioRadio® 150 has been implemented at Case Western Reserve University, Lake Forest College, and a Student Design Capstone Lab. Twenty-one other labs (for a total of 31) are also included in the lab course, and these can be mixed and matched with the 10 suggested labs, or taught in a different semester.

Advanced device design
Home testing, wireless devices, personalized medicine, and lower costs are four megatrends that are changing the face of medicine. Many universities still use older, non-wireless equipment for teaching electrophysiology courses. This laboratory course allows students to design and build wireless apparatus using the BioRadio® 150. Cleveland Medical Devices Inc., Cleveland, OH. The laboratory course may be designed to cover either one or two hours, depending on the number of students taking the course.

Discussion
10 Labs have been developed to provide hands-on experiments for teaching the peripheral nervous system. They are:
• Biopotentials Basics: This laboratory provides an introduction to the origins, measurement, and applications of human biological signals. Students will learn the important background information on these topics such as: fundamental biophysics, electrochemistry, and ionic currents, the Hodgkin-Huxley model of the giant squid axon, resting and active ion channels, and Nernst’s potential. In addition to the lecture, there is a lab session on this topic, given each week to cover a different aspect of biopotential measurement.
• Electromyography I: This lab provides an overview of how the control of the human body is mediated by the peripheral nervous system. Students will learn how the electromyograph (EMG) works and how to measure and interpret EMG signals. This laboratory course is designed to teach students to record and analyze the electrophysiological signals of the peripheral nervous system. This laboratory course utilizes the BioRadio® 150, a lightweight, wireless physiological monitor with 12 physiology channels. The laboratory course may be designed to cover either one or two hours, depending on the number of students taking the course.

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References

Cleveland Medical Devices Inc., Cleveland, Ohio 44103 USA

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