Dramatizing the Heart

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BIOL 124: Introduction to Human Anatomy and Physiology I

My students certainly enjoy acting out physiological processes; I have found that dramatization has not only keeps my students on top of their studying because they want to know how to participate, but the skills taught in lecture are heavily reinforced by active participation. For example, in my large lecture classrooms, we dramatize the cardiac cycle in a repetitive series of groups on the stage. Multiple dramatizations mean the students have opportunities to change roles, as well as to view the process many times in order to grasp all steps involved in a single heartbeat.

First, a group of students will form a figure eight to represent the right or left side of the heart. Some students are assigned cells mimicking the atrium and ventricle (chambers of the heart), while other students are designated as nodes or autorhythmic cells, valves (atrioventricular and semilunar), the chambers being contractile cells. The roles of the receptors of the heart are also be assigned to demonstrate what happens when changes in force and rate of contraction are introduced in the scheme of the heartbeat, either chemically or by the autonomic nervous system.

The students learn that electrical events (seen on ECG/EKG) occur first which then initiate mechanical events such as contraction (systole) or relaxation (diastole) of the atrium or ventricle. When one chamber is contracting, the other is relaxing and receiving blood. When I give a signal, students of the atrium will raise their hands up to signify atrial depolarization (electrical event).

To demonstrate atrial contraction, students step forward and make the chamber smaller (mechanical event). Once this has occurred, ventricular depolarization (electrical event) will begin at the AV node, and that student will raise their hand, causing the ventricle to begin to contract with students stepping forward after they raise their hands, as the students of the atrium are stepping back to the original position. Some students are assigned to portray blood moving from the atrium to the ventricle as the heart chambers undergo mechanical events.

Students participate in a variety of scenarios that allow a broad spectrum of concepts to be taught. These include seeing what occurs when stimulants or inhibitors (norepinephrine, acetylcholine neurotransmitters) are introduced. We also explored what happens to the activity of the heart when exercise is induced. These are often difficult concepts for students to master involving heart activity events, and many students have expressed that physically participating in acting them out helps them better understand the mechanisms behind the processes.