Researchers at the University of South Florida developed a system for measuring the oxygen saturation and respiration rate of cardiovascular systems by way of green light reflectance.

The degree of oxygen saturation of hemoglobin in arterial blood is often a vital index of the condition of a patient. As blood is pulsed through the lungs by the heart action, a certain percentage of the deoxyhemoglobin picks up oxygen so as to become oxyhemoglobin. From the lungs, the blood passes through the arterial system until it reaches the capillaries at which point a portion of the oxyhemoglobin gives up its oxygen to support the life processes in adjacent cells.

A critical limitation in previous noninvasive pulse oximeters is the few number of acceptable sites where a pulse oximeter probe may be placed. Transmittance probes must be placed in an area of the body thin enough to pass the red/infrared frequencies of light from one side of the body part to the other, such as an ear lobe or finger nail bed. In the case of red/infrared reflectance oximetry probes, they do not function well because red and infrared wavelengths transmit through the tissue rather than reflect back to the sensor. Therefore, red/infrared reflectance sensor probes are not typically used for many potentially important clinical applications including: use at central body sites, enhancing poor signals during hypoperfusion, or decreasing motion artifacts.

USF inventors created a reflectance pulse system using two sources in the green optical region, operating at two different wavelengths. This system provides the maximum reflectance pulsation spectrum. Since hemoglobin reflects in the green optical spectrum, this device allows for use at central body sites, as well as its application in the aforementioned situations for enhancing poor signals during hypoperfusion, or decreasing motion artifacts. This system provides numerous benefits of the current state of the art red/infrared transmittance and reflectance probes.

**ADVANTAGES:**
- Operates in reflectance mode
- Applicable at central body sites
- Measures oxygen saturation
- Measures respiration rate

**Allows for placement at central body sites**

Visible light spectrum with a peak in the green light region
(http://emandpplabs.nscee.edu/cool/temporary/doors/electrospectrum/)

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