

WHAT IS CLAIMED:

1. An optical measurement system to extract the levels of hemoglobin and oxygen saturation in different layers of tissue, comprising:
 - a light source with a plurality of wavelengths, configured to illuminate an area of tissue, wherein the light source illuminates the tissue with structured light;
 - a detector configured to capture the light signals reflecting from two or more layers of tissue from the illuminated area of tissue at the plurality illumination wavelengths;
 - a processor configured to compute, based on the captured light signals, one or more estimates of tissue vascular health that correlate to the severity circulatory complications due to diabetes, wherein the processor is configured to compute based on the captured light signals, hemoglobin and oxygen saturation levels in each of the two or more layers of tissue, wherein the one or more estimates of tissue vascular health comprises an ulcer risk based on the ratio of the computed hemoglobin levels at superficial and deep levels; and
 - a display or communication device configured to display or report the one or more estimates of tissue vascular health that correlate to the severity of circulatory complications due to diabetes.
2. The system of claim 1 wherein the light source illuminates the tissue with visible and near-infrared light.
3. The system of claim 1 wherein the detector is a 2D imaging detector array.
4. The system of claim 4 wherein the 2D imaging detector array comprises a CCD/CMOS camera.
5. The system of claim 1 wherein the detector is a single-element detector.
6. The system of claim 6 wherein the single-element detector is one of a photodiode and an optical fiber relay to a detection system.
7. The system of claim 1 wherein the display displays images of the processed data from captured light signals, displays images of the processed data and enables selection of values, or displays images and statistical distribution of values.
8. The system of claim 1 wherein the display is one of an interactive touchscreen device, a tablet, and a digital phone.

9. The system of claim 1 wherein the optical measurement system is configured to interface with a computer system, tablet, or digital phone with a wired or wireless connection.