

Introducing the
MicroScan™



MicroVisionMedical
a view to cure



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Clinical Applicability

Following its introduction in 1996, Sublingual OPS (Orthogonal Polarization Spectral) imaging revealed the central role of the microcirculation in the pathophysiology, outcome and treatment of sepsis. OPS imaging allowed clinicians to visualize for the first time significant changes in the microcirculation under clinical conditions. The clinical significance of these observations and the measurement of changes in response to treatment of the smallest microvessels, the capillaries, have identified the value of this technology in the treatment of septic shock. Other research using OPS imaging has identified additional potential clinical applications.

Microvision Medical creates the Future

Microvision Medical introduces the **MicroScan™**, the next generation instrument which provides real-time intravital video images of the microcirculation. The **MicroScan™** offers improved image quality in a wide variety of clinical scenarios. Because it has lower energy requirements, the **MicroScan™** can be powered by battery and/or portable computer to illuminate low-powered high-intensity bright LEDs. These LEDs provide direct illumination on the tissue while observations are made adjacent to the light. This novel approach is called **Sidestream Dark Field (SDF)** imaging. It provides more light to the specific tissue which results in improved image quality.



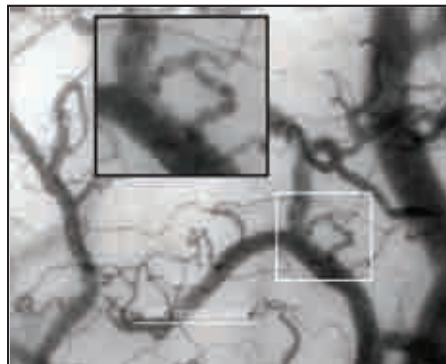
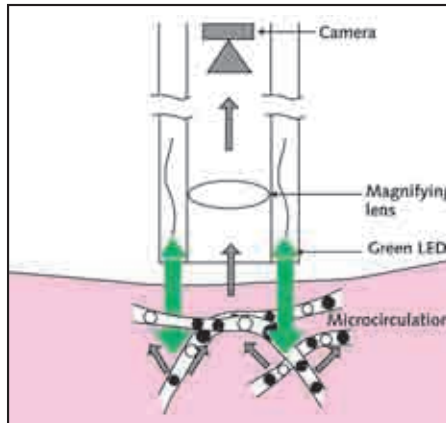
Principles of Sidestream Dark Field Imaging (SDF)

SDF (Sidestream Dark Field) imaging utilizes a novel method of reflectance avoidance in which the illuminated light and reflected light travel via independent pathways. In this modality, a light guide is surrounded by green (530 nm) light emitting diodes (LEDs). The light from the LEDs is absorbed by the hemoglobin of erythrocytes and results in the ability to observe the flowing cells. The concentrically placed LEDs at the tip of the probe, protected by the disposable cap, send penetrating green light deep into the tissue, illuminating the microcirculation. By not being in direct optical contact with the sensing central core of the probe, no direct surface reflections are allowed to interfere with the image of the microcirculation. A 5 or 10 times magnifying lens is used to project the image onto a video camera, providing clear images of the capillaries without blurring and allowing for better computer automatic analysis of the images. The increased depth of light penetration into the tissue using SDF allows the deeper sublingual arterioles to be clearly observed.

SDF Versus other Technology

OPS Imaging - Sidestream Dark Field imaging has characteristics which make it superior to other modes of imaging such as OPS imaging. OPS imaging illuminates the tissues with polarized green light and measures the reflected light from the tissue surface after filtering out the polarized portion of the reflected light. This filters out the surface reflection of the tissues and allows the visualization of the underlying microcirculation. Due to the reflected and emitted light passing down the same light guide (mainstream) however, OPS imaging is highly sensitive to internal scatter of light. This results in limited visualization of the capillaries due to blurring. The technique also requires high-powered bulky light sources, limiting its utility in difficult conditions such as critical care or intensive care medicine.

Dark Field Imaging - Sidestream Dark Field imaging is different from Mainstream Dark Field imaging. Dark Field imaging has been described as a way of improving contrast and lowering surface reflectance, but it typically utilizes illumination and reflectance light paths that travel down and back the same pathway. In the past, Sidestream Dark Field illumination has been applied by ring illumination to improve epi-illumination, but it has not been applied to achieve true dark field illumination by illuminating one segment of a substrate and observing in another segment the image of the microcirculation and its flowing cells.



Ease of Use

The lightweight and portable video microscope can be configured with either 5 X or 10 X optical probes. The **MicroScan™** probe is covered with a sterilized disposable lens that prevents direct contact between the instrument and the patient or animal when performing a variety of microcirculation observations and analyses. The **MicroScan™** is sophisticated in design but easy to use. When attached to a lap-top computer, it is capable of capturing images and storing them directly on the hard drive for analysis. New analysis software for the system is expected to be released in early 2005 and will provide easy analysis of the basic parameters such as diameter, red cell velocity and functional capillary density.

Ince C: The microcirculation is the motor of sepsis. Critical Care 2005, 9(suppl 4):S13-S19.

Boerma EC, Mathura, KR, van der Voort PH, Spronk, PE, Ince, C. Quantifying bedside derived imaging of microcirculatory abnormalities in septic patients: a prospective validation study. Crit. Care 2005;9 (6) R601-6 Epub 2005 Sep w22

SDF and Measurements

Sidestream Dark Field illumination can be used to enable the comprehensive evaluation of the functional state of the microcirculation. This is achieved by an analysis of the moving cells in the images, which permits the quantitative measurement of red blood cell flow in the capillaries. This measurement is believed to represent a truly sensitive measurement which is indicative of cardiovascular function or dysfunction. Sidestream Dark Field illumination utilizes reflectance avoidance in combination with optical magnification to provide a superior method of measurement of the functional state (e.g. perfusion) of the microcirculation. Additionally, morphological characteristics of the microcirculation, such as functional capillary density and micro-vessel morphology, can be measured using reflectance avoidance imaging. Homogeneous perfusion of the capillaries is a prerequisite for normal function of the microcirculation and abnormal perfusion, or diminished capillary perfusion, is considered an early and sensitive indicator of cardiovascular disease and failure.

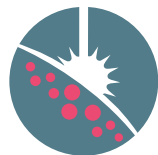
OFFER

The instrument includes a
BATTERY PACK and a **5 X PROBE**.

The **MicroScan™** provides a standard analog video signal output that can be interfaced with any computer or video recorder including a DVD recorder. Package pricing is available which includes a lap-top and a variety of recorders and monitors.

The **RESEARCH SOFTWARE PACKAGE** will be introduced in the first quarter of 2006, call for pricing.

TO RECEIVE MORE INFORMATION,
a formal quotation or to place your order for the new **MicroScan™**,
please contact:



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