Quantitative Optical Spectroscopy Offers a Cost Effective Alternative for Detecting Cervical Cancer

Introduction/Objectives

Current methods of detection and management of cervical pre-cancers may miss significant disease and generate false positives. The result can be a delay in diagnosis or overtreatment. The LightTouch uses biochemical technology to scan the cervix and detect morphological and biochemical abnormalities that indicate cervical pre-cancer and cancer. Using reflectance and fluorescence spectroscopy in a hyperspectral output, the LightTouch is able to scan the entire cervix in less than one minute. Visible light can penetrate tissue below the surface layers and to beyond the basement membrane allowing diagnosis of precancers in the cervix (Figure 1).

Fluorescence spectra reveal biochemical and metabolic changes while reflectance spectra reveal morphological changes associated with pre-cancer (Figure 2). For reflectance measurements, light from the xenon arc lamp is directed under software control in a predetermined order and scan pattern. The reflectance spectral output of the cerclix is scanned and information is acquired down to the basement membrane; disease can be identified with up to and beyond the basement membrane. The result can be a delay in diagnosis or overtreatment.

As estimated 90% of abnormalities found by Pap are ASC-US, ASC-H, LSIL or greater. Approximately 6 million women are referred to biopsy on a yearly basis. Of that 6 million, the vast majority of biopsies are negative for significant disease. For the ALTS trial, showed that only about 5% of ASC-US Pap tests and 6% of LSIL Pap tests will result in a histopathological diagnosis of CIN3.