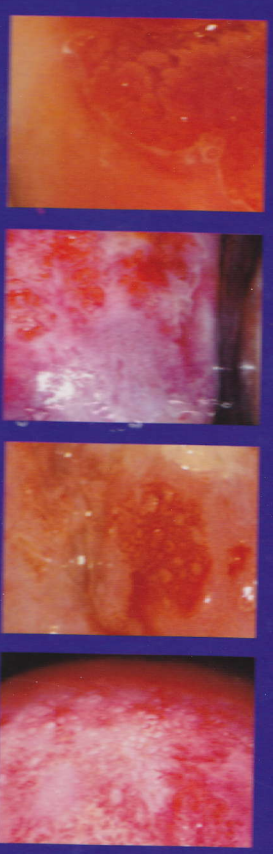
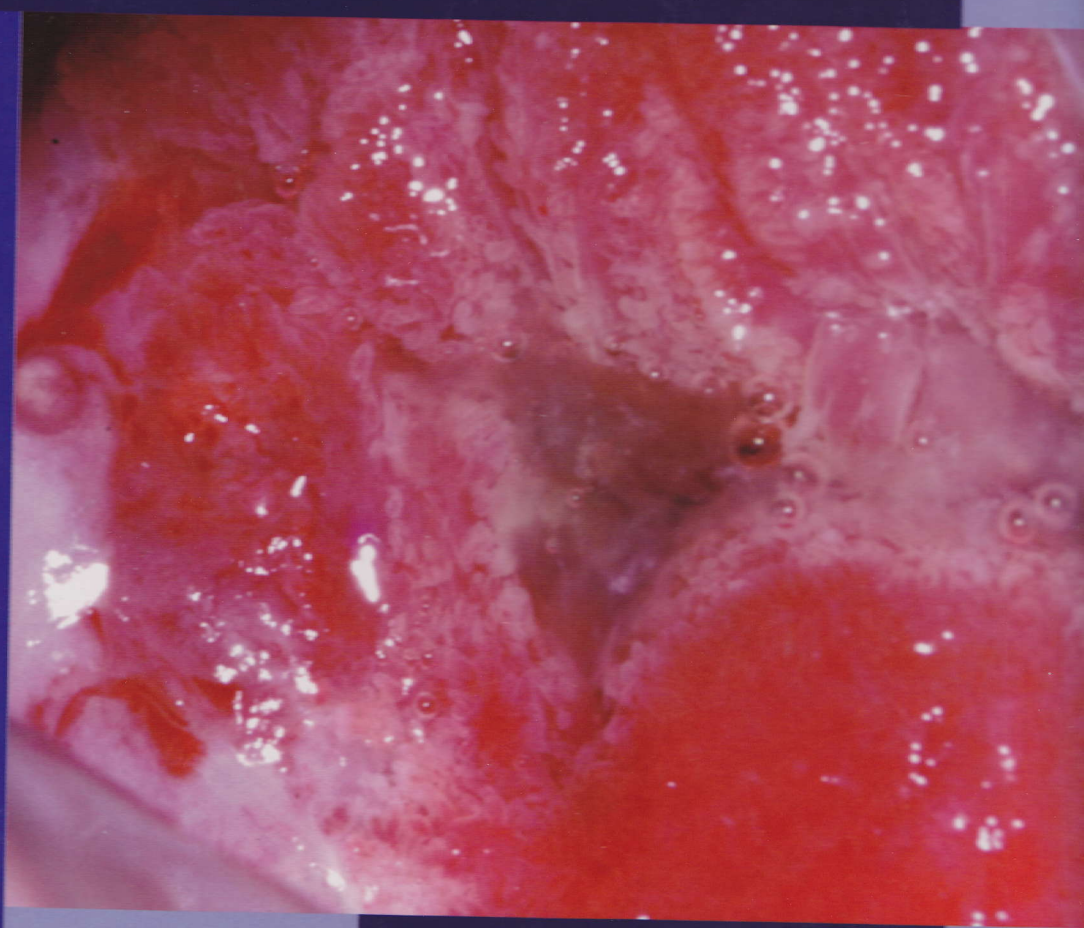
2nd Edition

B Shakuntala Baliga

Principles and Practice of COLPOSCOPY





Foreword

Patrick Walker

JAYPEE

NEW TECHNOLOGIES FOR IMPROVING COLPOSCOPY

Dynamic Spectral Imaging (DSI)

Professor Costas Balas and coworkers have noted a correlation between the dynamic scattering characteristics of the acetowhite (AW) effect and the structural and functional characteristics of the cervical epithelium.[14] This correlation enables the *in vivo* assessment of the epithelium noninvasively, objectively, and with instant results. They have a developed an instrument (DySIS) that utilizes the dynamic spectral imaging (DSI) for detecting CIN and guiding biopsies (Figs 21.6 to 21.9). The DySIS device provides high definition magnified imaging of the cervix and quantitative assessment and mapping of the AW effect, both contributing to the improvement of the diagnostic accuracy of colposcopy. The pseudocolor map is generated by DySIS on the basis of the measurement of the diffuse reflectance vs. time curves in millions of image pixels. Modeling and parametric analysis of these curves result in quantitative AW indices per image pixel. The spatial

igure 21.6: The DySIS device. Photograph reproduced with kind permission of Prof C Balas, Greece

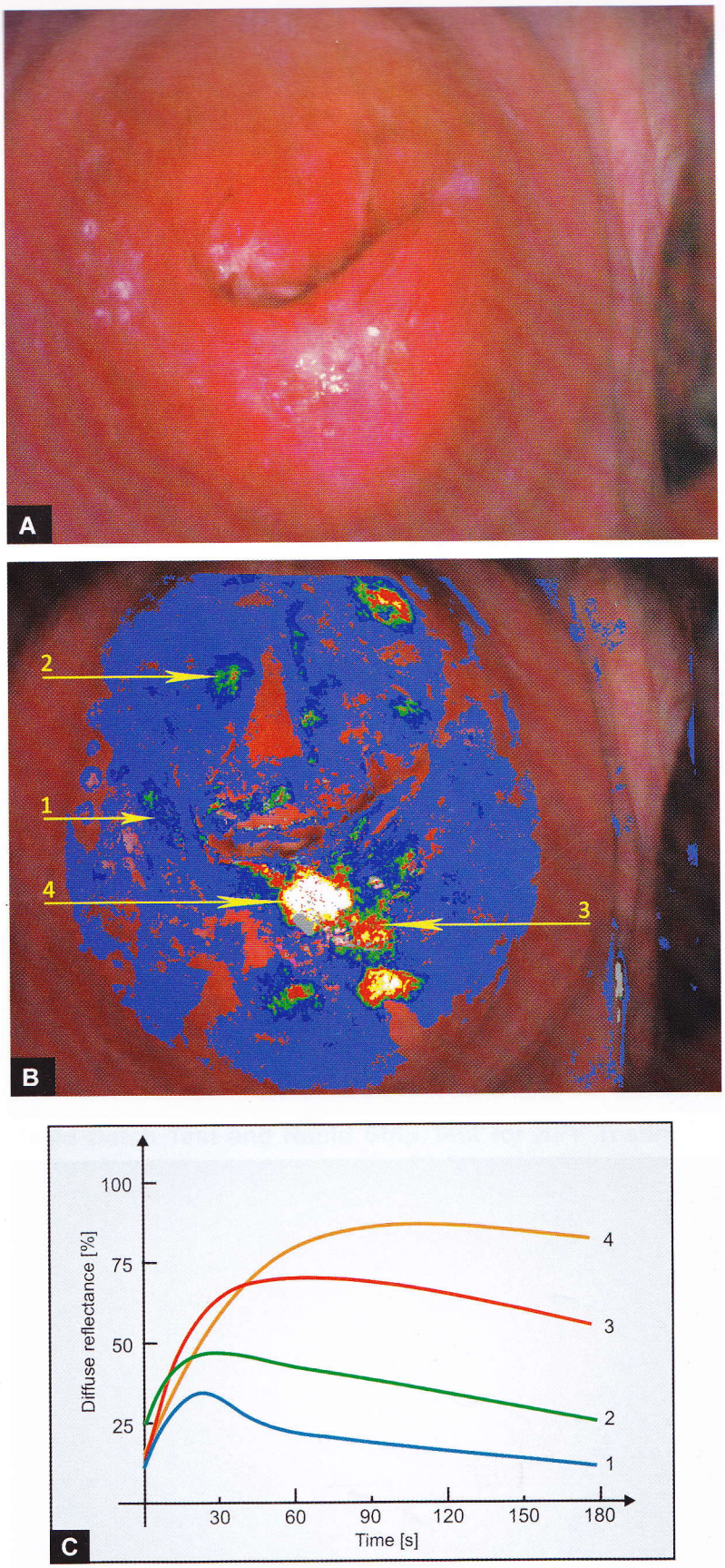
bution of different parameter value-ranges is color-coded ing the pseudocolor map. Red, and yellow/white pseudocolors DySIS indicators for the presence of high-grade neoplasia in orresponding tissue areas. Soutter and coworkers have found IS more sensitive than colposcopy for detecting high-grade ns.[15] As the results are user-independent, it is suitable for use ursing personnel.

IA Cervical Imaging System

device utilizes the properties of fluorescence, reflectance and troscopy intrinsic to tissues. It has been approved by US FDA larch 2006 to enhance the sensitivity of colposcopic exami- ons in women with abnormal Pap smears. Two prospective omized controlled trials have shown it to result in a > 25% ase in true positive rate of colposcopy in patients with ASCUS SIL with only a 4 percent increase in false-positive rate when rasted with colposcopy alone.[16]

heliometer (Electrical Impedance Probe)

is a pencil type probe used to record impedance spectra from oints on the cervix before and after application of 5% acetic [17] (Figs 21.10A and B). Impedance measurements are recorded ovide a tissue diagnosis in realtime (instant results). The device the potential to be used as an adjunct to colposcopy for the



Figures 21.7A to C: (A)The image of a cervix with a biopsy confirmed high grade neoplasia; (B) the pseudocolor map generated by DySIS for the same cervix, overlaid on it; (C) the map has been generated on the basis of the measurement of the diffuse reflectance vs. time curves in millions of image pixels. Modeling and parametric analysis of these curves result in quantitative acetowhite indices per image pixel. The spatial distribution of different parameter value-ranges is color-coded forming the pseudocolor map (B). Red, and yellow/white pseudocolors are DySIS indicators for the presence of high grade neoplasia in the corresponding tissue areas. Photographs reproduced with kind permission of Prof C Balas, Greece