
[This Week's Citation Classic]

Cytologic Diagnosis of Human Cancer
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In 1952, as a young pathologist, I joined the staff of the Memorial Hospital for Cancer and the Sloan Kettering Institute and became fascinated with the options provided by cytologic techniques as a tool in the diagnosis of human cancer. At that time, following the initial observations by the Cornell anatomist George N. Papanicolaou, the knowledge of cytology was very limited and, with very few exceptions, confined to cervical and vaginal smears (today popularly known as Papanicolaou smears) for the detection of early cancer and precancerous states of the uterine cervix. At Memorial, following a tradition introduced in the 1920s by the surgeon Hayes E. Martin, tumors were also being studied by aspiration smears prior to surgery for confirmation of clinical suspicion of rather obvious cancers, mainly of the breast and lymph nodes.

It became rapidly evident to me that there had been very little work done to test the limits of cytologic techniques when applied to other organs and organ systems. It also became evident that most tissue pathologists knew very little about cytology and that most people practicing cytology had limited understanding of the diagnostic "standards" set by tissue pathology. I resolved to bridge this gap. First, however, I had to learn how to interpret cell samples, a technique that is vastly different from, and in many ways much more difficult than, diagnostic surgical pathology.

The person who taught me cytology and was a stern taskmaster, insisting on perfection, was Grace Robinson Durfee, now retired, who was the chief technologist in the Laboratory of Cytology, then located at the Strang Cancer Prevention Clinic at Memorial Hospital. First a teacher, Grace soon became an invaluable collaborator and helped with a number of papers to which her name is attached. Perhaps the most important joint contribution was the paper on an abnormality of squamous cells in cervical smears, characterized by nuclear enlargement and the presence of a large, clear perinuclear zone, which we named koilocytotic atypia, from the Greek word "koilos," meaning hollow or cavity. The association of this abnormality with precancerous lesions and cancer of the uterine cervix was duly noted. Many years later it became evident that "koilocytosis" is a pathognomonic manifestation of infection with human papilloma virus, which in turn has been shown to be associated with carcinoma of the uterine cervix. The term is now widely used in the diagnostic sense without knowledge of its origin.

Another venture in which Grace collaborated was the first edition of the book that is the primary subject of this summary. This book was initially conceived as an introduction to cytologic techniques and pattern interpretation for pathologists and cytotologists. Grace's collaboration in the first edition was indispensable as photographer, editor, counsel, psychiatrist, and general factotum. Her name was listed on the title page of the first edition as a contributor. The book opened unexpected vistas on options that cytologic techniques offered in reference to detection of human cancer of many organs, such as the lung, urinary bladder, gastrointestinal tract, and so on. It also suggested, in a chapter written by John Berg, the use of aspiration techniques for the diagnosis of human cancer.

The book grew exponentially with each edition and many of the ideas timidly advanced nearly 30 years ago have now come to widespread use and acceptance by the medical community. Still, it is surprising, and most gratifying, to see that this book received the extraordinary recognition in becoming a Citation Classic, a distinction bestowed on relatively few books to date.

1. Papanicolaou G N & Trust H F. Diagnosis of uterine cancer by the vaginal smear. New York: Commonwealth Fund. (1943) 46 p. (Cited 545 times since 1945.)

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