

This Week's Citation Classic®

Koss L G. *Diagnostic cytology and its histopathologic bases*. Philadelphia: Lippincott. (1961) 1979. 2 vols.
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The essential purpose of this textbook was to provide a comprehensive summary of human disease as expressed at the cellular level by light microscopic examination. Many new ideas were proposed in reference to the application of cytologic techniques to detection and diagnosis of human cancer of various organs and the natural history of precancerous events. [The SCJ⁹ indicates that the various editions of this book have been cited in over 1,260 publications.]

Cytologic Diagnosis of Human Cancer

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March 1, 1989

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,¹ the knowledge of cytology was very limited and, with very few exceptions, confined to cervical and vaginal smears (today popularly known as Pap smears) for 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,² 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 tis-

sue 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*.³ 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.⁴ 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 cytotechnologists. 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 & Traut H F. *Diagnosis of uterine cancer by the vaginal smear*. New York: Commonwealth Fund. 1943. 46 p. (Cited 545 times since 1945.)
2. Martin H E & Ellis E B. Biopsy by needle puncture and aspiration. *Ann. Surg.* 92:169-81. 1930. (Cited 185 times since 1945.)
3. Koss L G & Durfee G R. Unusual patterns of squamous epithelium of uterine cervix: cytologic and pathologic study of koilocytotic atypia. *Ann. NY Acad. Sci.* 63:1245-61. 1956. (Cited 120 times.)
4. Koss L G. Cytologic and histologic manifestations of human papillomavirus infection of the female genital tract and their clinical significance. *Cancer* 60:1942-50. 1987.

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