Henry Ford Hospital Medical Journal

Volume 3 | Number 1 Article 9

3-1955

Cancer Detection

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CANCER DETECTION

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Until the etiology of cancer has been discovered and a specific agent manifested for its cure, the best method of controlling this disease continues to be recognition and treatment of the malignancy in its earliest form. In many instances it is possible to recognize and eradicate lesions which, while not yet malignant, possess definite malignant potentialities. Our objective in controlling cancer today must be the maximal utilization of methods of prevention, detection, diagnosis and treatment already at hand.

Early recognition of cancer can be accomplished in several ways. The first, the ideal of any cancer detection program, is for every doctor's office to be a cancer detection center. Such a plan will ultimately be necessary to meet the requirements of a full scale, cancer detection program and save the 50% of cancer victims now possible. However, it has the disadvantages of being a relatively limited type of examination, being done by doctors of varying interest and with varying thoroughness, and statistical data accumulated by such a system is difficult to evaluate. The opposite of this, of course, are central cancer detection centers associated with the various medical schools and some clinics. In these centers, examinations can be more complete, done by experienced personnel, and the results, already centralized, make statistical evaluation a relatively simple problem.

The Yates Memorial Clinic, representing one of the latter type of clinics, was established in 1950 by the Southeastern Division of the American Cancer Society and is operated professionally by the Wayne University College of Medicine, with the approval of the local medical society. Patients come to the clinic through the stimulus of information gained from the radio, magazines, newspapers or are referred by private physicians. Before being examined, the patients must state the name of the private physician to whom the report is to be sent. A complete history is taken and physical examination is performed, including in the female a pelvic inspection with routine Papanicolaou smears of the cervix and vagina. Sigmoidoscopic examinations are done regardless of sex or age. Complete blood counts and urinalyses are performed routinely, and biopsies are taken when indicated. Ear, nose and throat examinations, with visualization of the vocal cords, are made, and roentgenograms of the chest are obtained when symptoms warrant. The diagnoses and recommended treatment are not discussed with the patient; rather they are instructed to consult their private physicians. This examination is free, although voluntary contributions are encouraged.

The basic aims of the Yates Memorial Clinic, as postulated when the clinic was initiated in May, 1950, are: (1) to operate a small model teaching clinic, (2) to provide facilities for the early diagnosis of cancer, including the evaluation of various diagnostic tests and (3) to gather statistical data on the prevalence and incidence of cancer in the community. With these goals in mind, I should like to point out some of the accomplishments of the clinic. The coding, tabulation and analysis of the records, as well as the maintenance of follow-up of persons examined, is being done by the

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CHART I

Yates Memorial Clinic

NUMBER OF PATIENTS EXAMINED

May, 1950 – Dec., 1953

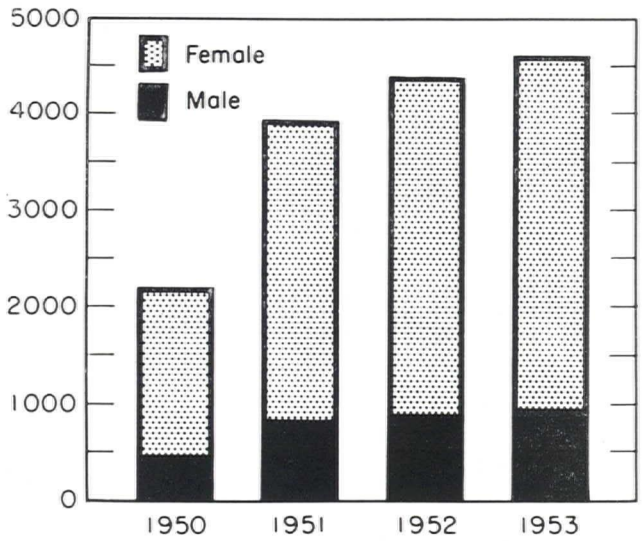
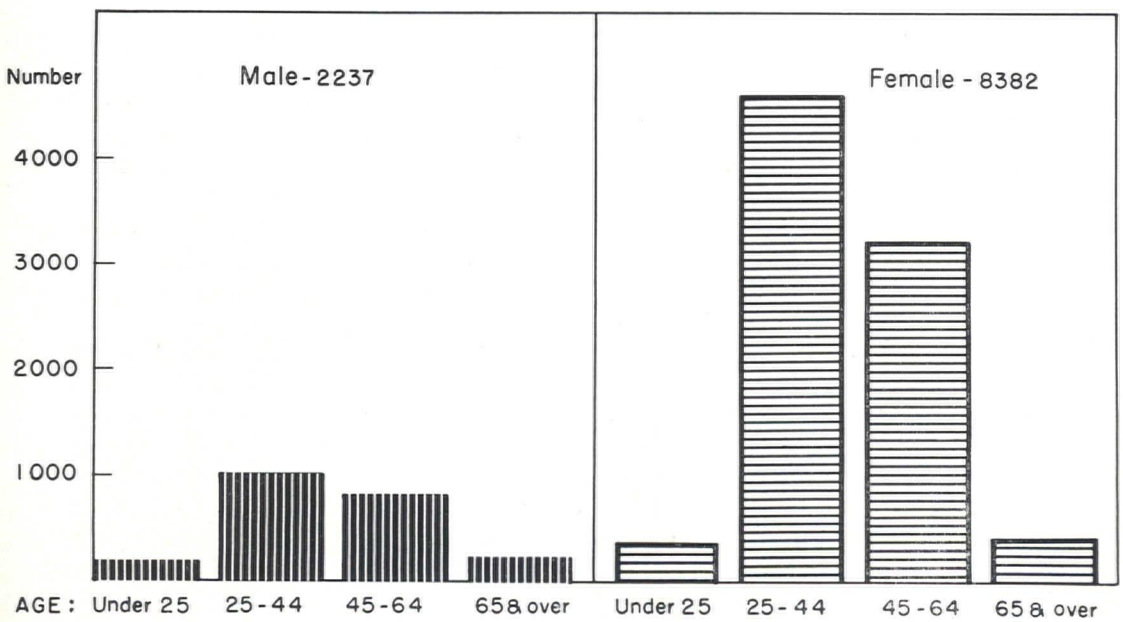


CHART II

CANCER DETECTION EXAMINATIONS BY AGE AND SEX

Yates Memorial Clinic, May 1950 - December 1952



section of statistical research of the American Cancer Society. Various analyses of the data will continue. From May, 1950 through December, 1953, 15,266 patients (Chart I) have been examined at the Yates Clinic, with the yearly breakdown as shown in this graph. During 1950 we examined 2,238 patients and the number has steadily increased until in 1953 we examined 4,639 individuals. In most cancer detection centers, there is a decided preponderance of women. In our series approximately 80% were women. The female majority can probably be explained on the basis of the greater prospect of detectable lesions in a curable stage in women and their ability as housewives to visit the daytime clinic.

In Chart III is shown the distribution of the patients examined at the Yates Memorial Clinic from May, 1950 through December, 1952, by age and sex. It again demonstrates the preponderance of females and also shows the tendency toward a young age group. Over half of all patients examined were under 45 years of age. We hope, in the future, to ask those over 45 to return for yearly examinations.

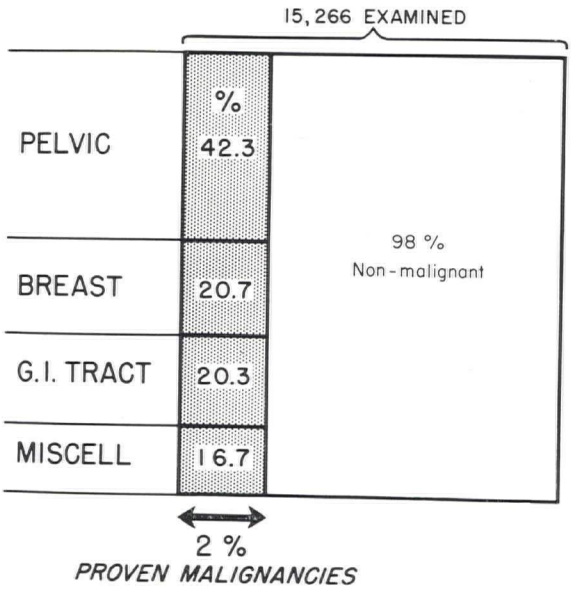
In Chart III is shown the incidence of proved malignancy and a general analysis of distribution by site. Pelvic malignancies constitute the largest group of detectable cancers, 42.3%, followed by breast, 20.7%, the gastrointestinal tract, 20.3% and finally, the miscellaneous group, 16.7%. The relatively high, overall rate of proved malignancy in this clinic, 2%, as compared to other series, is partly explained by the fact that not all our examinations can be classified as true, well-person, "detection examinations. Cancer "detection" implies the examination of an asymptomatic and, presumably, healthy individual. The prevalence of cancer found often reflects the thoroughness with which symptomatic cases are weeded out and refused examination. Although the Yates Clinic primarily serves the asymptomatic patient, only those with

CHART III

Yates Memorial Clinic

SITE and INCIDENCE of PROVEN MALIGNANCY

May 15, 1950 - Dec. 31, 1953



complaints obviously related to cancer are denied examination. The second reason for the high rate of malignancy in this clinic is the emphasis placed on vaginal and cervical smears and the generous use of biopsies. Of the 15,266 patients examined, 1,410, or 9.2%, have had a biopsy of some suspicious area.

The number of malignancies diagnosed per 1,000 examinations by age and sex is shown in Chart IV. As might be expected, the incidence of malignancy increases with age. In patients over 70 years of age, more than *70* of every *1,000* examined are found to harbor a malignancy.

In addition to the proved malignancies, 9% of all patients examined are suspected of having cancer, or cancer cannot be ruled out, and these patients are referred back to their family physician for further diagnostic evaluation. An endeavor is being made at the present time to follow all patients with suspected or known malignancy through contact with their private physician or by return examination.

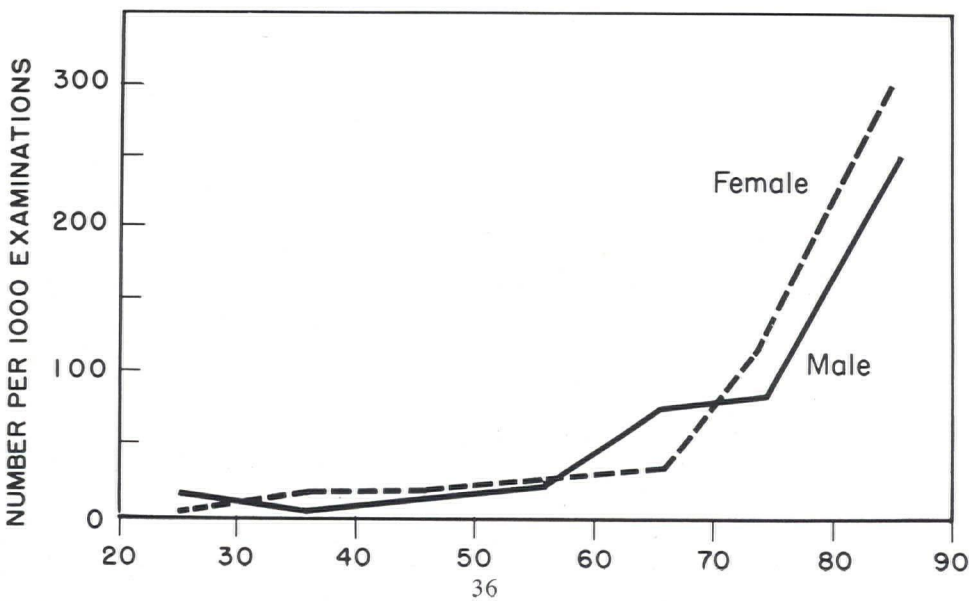
When complete and thorough examinations are made, many non-neoplastic diseases are discovered. These conditions are also reported to the patient's physician. Of interest is the fact that over 85% of patients entering the Yates Clinic are discovered to have one or more diseases, many of which have already been diagnosed by their family physician.

The clinic has carefully studied vaginal smears as a screening method to detect early cancer of the uterus. We have found that the wooden spatula has been the most satisfactory in obtaining cervical-vaginal smears. This simple, cheap device can be purchased or made from an ordinary tongue blade. We have felt that the material obtained from the cervical scraping is more diagnostic than the vaginal fluid because the cells are less macerated and deteriorated. The fixative solution and the staining method are those recommended by Papanicolaou.[1]

CHART IV

NUMBER OF CANCER DIAGNOSES BY AGE AND SEX

Yates Memorial Clinic, May 1950 - December 1952



Several ways of reporting smears are being used in this country. The classification employed at the Yates Clinic is that proposed by Graham[2] consisting of: negative, atypical, suspicious and positive. The first and last classes need no clarification. An atypical smear is one in which some cells, although not normal, are characterized by abnormalities of insufficient degree or kind to arouse suspicion of malignancy. A suspicious smear is one in which the cells are so abnormal as to suggest a definite possibility of malignancy.

The Papanicolaou smear is a method of screening for cancer; if positive, sufficient suspicion is aroused to obtain a biopsy. Smears are not diagnostic in themselves, and treatment should not be initiated on the basis of the smears alone. On the other hand, there are some cases where a positive smear has been followed by a negative biopsy, because the specimen was not taken from the involved area. For statistical purposes the positive smear does not definitely classify the case as malignant until a confirmatory biopsy has been obtained.

As seen in Chart V, of 12,015 women in whom cervical-vaginal smears were obtained, malignant neoplastic cells were found in 137 cases, or 1.1%. In sixteen cases, biopsies were not obtained and these are not included in the calculation of the percentages. Of the patients with positive smears, 121 were subsequently biopsied either at the Yates Clinic or elsewhere, and the diagnosis was confirmed in 109 cases, or 90.1 per cent. There were 12 cases with positive smears but with subsequent negative biopsies in the tissue examined, giving a 9.9% false positive rate. More biopsies would, we believe, yield a few more positive results.

Forty, or 35.4%, (Chart VI) of the cervical carcinomas were considered pre-invasive (carcinoma in-situ) by biopsy, but are classified as probably or possibly, rather than definitely, pre-invasive because of the impossibility at times of determining, by the tissue obtained, the true extent of the disease. Not infrequently, more complete histological examinations of such cervices will reveal areas of outright invasion. Seventy-three cases, or 64.9%, of the cervical carcinomas were considered outright invasive on biopsy.

Of even greater significance is the fact, as noted in this graph, that 52 or 46.0% of the squamous cell carcinomas of the cervix were not suspected on clinical examination to be malignant but were found to have positive Papanicolaou smears and were later proved by biopsy to be malignant. In these patients, before the smear was found to be positive, a thorough history was taken and a physical examination performed, including a pelvic examination with direct visualization of the cervix by a staff physician, at which time no evidence of neoplasm was encountered. Without the smears as a screening procedure, these lesions would have been missed at a stage most amenable to cure. In the remaining 54% the diagnosis was first suspected clinically and confirmed later by smear and biopsy. The bottle-neck in screening large numbers of women by means of the vaginal smear is in the cost, time and the few available cytologists.

We recently had the opportunity of visiting the Airborne Instrument Laboratory, Inc. at Mineola, New York. They are experimenting with the development of automatic, high-speed, cytologic measurements for application to mass screening for cancer—an automatic, electronic scanner. These scientists are able to measure nuclear fluorescence

or density, nuclear size and the diameters of normal and cancer cells. It was stated that if this scanner can be perfected, 2,000 vaginal smears can be scanned daily. The cytologist will find it necessary, then, to examine those smears that have abnormal nuclei, abnormal cell structure and unusual nuclear fluorescence. This screening, it is estimated, can be done at a few cents a smear.

An important function of the clinic is to act as a teaching center in affiliation with the Wayne University College of Medicine. A course of instruction in cancer detection, consisting of one afternoon a week for twelve weeks, is offered by the Post-Graduate School of Wayne University. Here, physicians of an intern, resident, or general practice level actually perform the various procedures employed in recognizing early cancer. Because of the large volume of patients handled by the clinic, it is possible for a student, during his course of instruction, to execute a procedure such as the sigmoidoscopic examination enough times to become quite proficient. Emphasis is placed on actual performance of the various diagnostic measures rather than merely observation.

Since the staff of the Wayne University Medical School consists only of specialty personnel, our examinations are done by experts in the various fields, sigmoidoscopic examinations by surgeons, pelvic examinations by gynecologists, laryngoscopies by E.N.T. specialists, and general history and physicals by internal medical men.[3] Although we recognize the merit of general practitioners conducting the clinics, thus assuring the profession that any, well-qualified and interested medical doctor can perform a cancer detection examination, the advantage, from a teaching standpoint, in employing only specialists, is tremendous. Authorities in each aspect of the examination are present to provide the highest caliber staff to the students and practitioners in their course of instruction.

Our examinations are done on a production-line basis, in that the patient is shuttled from room to room for the various parts of the examination and, for this reason, much of the doctor-patient relationship is lost. Teaching is facilitated, however, in that the student may remain in the same station and receive concentrated instruction in one aspect of the examination. During one afternoon, for instance, a student may perform, under the guidance of a gynecologist, a complete pelvic examination, including the preparation of a Papanicolaou smear, on as many as 15 women.

A word should be mentioned regarding the value of educating the public as to what constitutes an adequate, cancer detection examination. We feel that, through the example set by the clinic, the patient will demand from his or her private practitioner an examination equaling that given at the clinic. In addition, the physician is stimulated to perform a more thorough examination because of statistics published by the clinic, demonstrating the value of such thoroughness.

It is our hope that, through these avenues of education, the clinic will set a standard for cancer detection in the community and will educate the doctor, as well as the public, in what to expect from such an examination. This will ultimately increase the effectiveness of cancer detection in the place where the great bulk of detection will eventually be done—the doctor's office.

CHART V

Yates Memorial Clinic

ACCURACY OF CERVICAL-VAGINAL SMEARS—May, 1950 - Dec., 1953

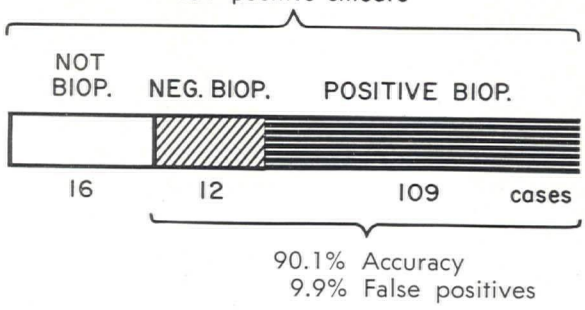
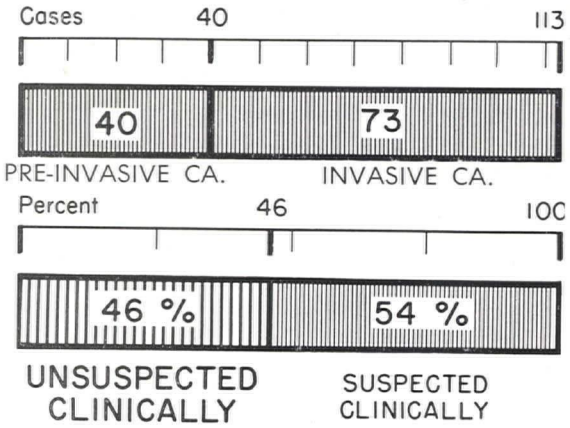


CHART VI

Yates Memorial Clinic—CERVICAL CANCER—May 1950 - Dec. 1953



SUMMARY

1. In this paper is reported the aims of Yates Memorial Cancer Detection Clinic and some of the findings in 15,266 patients, covering a period of operation from May 15, 1950 through December 31, 1953.

2. The incidence of 2 per cent proved malignancies is cited with a breakdown of these lesions according to site.

3. Cytologic diagnosis as a screening method for cancer, particularly of the cervix, is discussed and its accuracy is evaluated.

4. It is emphasized that fifty two cases of carcinoma of the cervix were not suspected on careful, clinical inspection but were diagnosed by smear examination and later confirmed by biopsy.

5. The role of the Yates Memorial Clinic as a graduate training center in cancer detection, in affiliation with Wayne University College of Medicine, is stressed.

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