

TRAINING OF PROFESSIONAL AND TECHNICAL PERSONNEL IN CYTOLOGY

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The main question regarding the training of personnel in the field of Exfoliative Cytology, is to have the student realize that honest devotion "to learning" counts more than lectures and that the best teacher is experience.

Of all points to be considered, first of all would be the selection of candidates.

A. There will be no problem with M. D.'s if they accept the above mentioned premise. Those who do not fulfill this requisite will sooner or later consider cytology as uninteresting and abandon their studies.

Medical school has furnished M. D.'s with adequate knowledge to become specialists in the branch of their choice. Clinicians, Gynecologists, Endocrinologists, General practitioners and others that wish to undertake the study of vaginal and cervical smears of their patients; Radiotherapists interested in a definite phase of cytology, such as Radio Response, or graduates who wish to approach the subject from a research standpoint, could easily become full time or part time cytologists. They must decide to follow a definite program starting with vaginal smears for endocrinology, vaginal and cervical smears for malignancy, and so forth. The length of each period of training will depend mostly on the individual, until it is felt that he is qualified to carry on this kind of work independently. Honest workers will continue improving as they study their own cases.

B. For Technicians:

1) *Qualification of the candidate:* The first interview will be to estimate:

a) *Age.* No strict limits of age can be established, but it is necessary to know whether the candidate, male or female, is old enough to shoulder responsibility, and young enough to undertake a new discipline.

b) *Personality, maturity, intelligence, exactness, initiative and patience to maintain constant attention during hours at the microscope, etc.* All these qualities that summarize the personality of the applicant, cannot be exactly evaluated during the first interview, and he should be accepted on trial to demonstrate, by daily contact, his skill, and his ability to use his knowledge effectively. Only in this way will it be possible to determine if he is suited for cytological work.

2) *Previous education:* Because educational systems vary from one country to another it is difficult

to draw up an overall picture of educational prerequisites, which also depends on the category and mission assigned to technicians and cytotechnologists. Nevertheless, we may say that technicians can be prepared even from regular nurses with no previous laboratory training. They can process specimens, prepare and stain smears, etc., and do it correctly. Some of them may later show interest in microscopic work, and in such cases, technicians who take advantage of the opportunities offered, may improve their education.

Cytotechnologists should have as a minimum a high school degree or similar. A year or two of college, especially in sciences, is most desirable, and experience in clinical or other laboratory work has a good qualification for the applicant. However, individual with less background than this but showing aptitude and right disposition, ought not to be discouraged. Dealing with students one learns that they can satisfactorily accomplish screening work if they receive adequate training regarding how to search for abnormal cells, how to screen out the negative cases of the daily series or select those cases with abnormal cytology that require further study.

3) *Training in an adequate laboratory:* During a period of at least six months, a well prepared program will be carried out which includes:

a) A brief review of general cytology and basic concepts in anatomy, histology, physiology, common diseases, colposcopy and female sex endocrinology for those who did not attend college. Instruction will be given progressively, according to the teaching facilities in the laboratory and without causing unnecessary confusion for beginners.

b) Introduction to the standard techniques. Preparation of staining solutions for the different staining procedures employed in the laboratory, care and use of equipment, processing of smears, filing and recording cases, microscopy in its different forms.

c) Students will attend the clinics of the hospital to learn how secretions and body fluids should be collected.

Cytotechnologists who have done all this during a month, have reached one goal and can go in for.

d) *Microscopic work.*

Once the student has passed this initiation period, he is assigned a place close to an experienced member of the staff and becomes familiar with the proper use and care of the microscope; he learns that to screen means to examine every field with attention to every normal or abnormal cell. The beginner reads the

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smears before or after the senior screener and discusses his findings.

Students then, turn gradually towards:

e) The morphological aspect of the normal epithelial cells of the vagina, cervix and endometrium, and the non epithelial cells such as blood cells, histiocytes, etc. The vaginal pattern in all ages of the female life, percentage of each type of cell, curve of desquamation during the menstrual cycle, vaginal cytology in pregnancy and its disorders. The changes in vaginal smears patterns after hormonal treatments, and in conditions such as inflammation, infection, etc., that may influence the picture, and will also study the bacterial flora, fungi, parasites, etc., cytolysis, autolysis, inflammatory changes and finally smears before and after radiation therapy, (S. R. and R. R.).

When the student after a period of about three months has become familiar with the common cell types, and is able to identify and classify the normal cells, he has reached another goal and can go forward towards the study of malignant cells.

At that moment of this training, the student is given smears from a carefully selected representative series of cases to study and report. For the first three to four weeks, marked slides with the corresponding clinical history attached are examined. Students write down their own description and diagnosis according to Papanicolaou's five classes, and check their own reports by looking at the back of the cards where they will find a brief description of the smear and the final diagnosis. Next comes cases from the daily routine material.

When problems appear to the trainee, the cytopathologist will help him. This personal contact during another couple of months, permits an appreciation of the student's progress.

The students and the teacher have to discuss cells on the same slide, because smears cannot be duplicated. When teaching a group, photomicrographs or the projection of slides provide an opportunity for the whole group to see the same cells. It is important for every one to have previously studied the smear under discussion.

A double microscope or an attached ocular are excellent, but this procedure is time consuming and interferes too much with the busy schedule of the cytopathologist.

Students are advised to alternate microscopic work with other routines, such as staining, preparing specimens, etc. Several negative cases in a row may produce fatigue, confuse the observer and allow his mind to wander while moving the slide. Free intervals for relaxation are recommended, as routine may soon become a tiresome task. To counter-balance this the cytotechnologist should engage in some research work so that he can take advantage of all the interesting phases that exfoliative cytology offers. Screeners should be invited to participate and to present cases. Round table discussions, lectures, seminars, etc., will complete the program.

All this puts emphasis on the importance of teamwork. A congenial atmosphere during gradual cytology training stimulates the students, teaches them how to concentrate on the case they have to report, develop a sense of responsibility and makes it possible to answer all questions asked by students and clarify their problems.

We should not fix time limits for each period of training, but six months is considered the time required for an average cytotechnologist to become proficient in screening cytological material from the female genital tract. It is then, that he can be considered a junior screener and treated as an useful co-worker.

Once students become acquainted with the cytology of the female genital tract, they can be introduced into the cytology of other organs.

Vaginal and cervical cytology is the most widely applied but training personnel should aim to teach them all types of cytology.

To study smears from other sources contributes so much to the formal education that this needs no emphasis.

Even though it is more difficult than vaginal smears, students will find it relatively easy to acquire knowledge of the normal and abnormal epithelial cells that appear in sputum, bronchial aspirates, urine, stomach washings or brushings, etc., if they complete at least one year in the laboratory for their basic training.

COMMENTS

Perhaps the privilege of having been a fellow in Dr. Papanicolaou's laboratory at Cornell University Medical College during the initial development of Exfoliative Cytology, makes me follow the Master's system in diagnosis, research and teaching.

I remember so well that in 1946, students were accepted "only for informal study" and received instruction about techniques, examination of smears and attended round table discussions. Intensive two week formal courses, the first one in September 1947 and extended to three months after 1951, were not considered sufficient. It was thought that individual training was more adequate.

Within a few years cytology "came of age", the smear method obtained wide acceptance, doctors could not stand the burden of cytodiagnosis and this then called for auxiliary workers, because the application of cytology could not be restricted for lack of trained cytotechnologists. Rapid courses offering theoretical and practical training were conducted everywhere, and at present, professional and technical personnel are trained in individual and in centralized schools. The general trend of training is similar in all laboratories. There are small individual differences, but it is generally agreed that a program carefully planned leads to good results, as it is well known to those who have read the discussions during the symposia of the International Academy of Cytology and of the Inter-Society Cytology Council, (now American Society of Cytology) (1), (2), (3).

I know it is not necessary, but I would like to point out that all members of the diagnostic team should keep close liaison with clinicians and pathologists and it is highly recommended that they should participate in the clinical work of the hospital. By doing so, the trainee assists in obtaining vaginal aspirations, cervical scrapings, endometrial aspirates, bronchial washings or aspirates, stomach brushings, etc. The connection with doctors and patients will help to learn the medical terminology, the pitfalls derived from technical errors, such as inadequate collection, smearing and/or fixation of the material. The cytotechnologists will be capable of advising clinicians about how to avoid mistakes and to establish mutual understanding between the laboratory and the clinics.

The position of cytotechnologists depends on the policy of the laboratory, ethics, legal points of view and of hospital regulations. Nevertheless, their part is so important that they must have a good recognition in a laboratory that serves three purposes: diagnosis, research and teaching.

It would be too long to give the list of all the fine books that should be consulted, therefore I am only going to mention Papanicolaou and Traut's monograph, (1943), as a basic text book, and Papanicolaou's Atlas of Exfoliative Cytology, (1954), for those with some knowledge. Everybody should regularly read Acta Cytologica as well as articles published in current medical journals.

To comment articles from books and journals and present interesting cases in round table discussions greatly counts in education, thereby preventing the peril of "diagnosticians" whose work is strictly mechanical.

SUMMARIZING

Training creates very few problems in a laboratory where questions properly answered encourage interesting discussions and where students become acquainted with the laboratory's working methods, and understand the scope and "the human significance of their work".

Regarding training personnel in the field of Exfoliative Cytology, the main problem is to have the student realize that honest devotion "to learning" counts more than all teachings.

Based on this premise, the discussion is about:

1. the personal qualifications of the student
2. the previous training, background, etc.
3. the cytological training in an adequate laboratory, including a) to receive and handle specimens, preparation, staining, and other routine techniques; b) the study of selected smears from demonstration boxes, starting with normal cases.
4. When should a student be considered a reliable junior screener and a reliable senior screener.
5. When can a cytologist and a cytotechnologist be considered qualified to screen negative cases and when can their positive reports be trusted.
6. Minimum and optimum length of time should be considered essential for each of the above mentioned training steps.
7. A review of recommended text books, journals, etc., is briefly presented.

RESUMEN

Relativo al entrenamiento profesional en el campo de la Citología Exfoliativa, el principal problema es dejar al estudiante darse cuenta de la dedicación sincera de "estudiar" cuenta más que todas las técnicas.

Basada en esta afirmación el estudio es acerca de:

1. Clasificación personal del estudiante.
2. Entrenamiento previo, formación profesional.
3. Entrenamiento citológico en laboratorios adecuados incluyendo (a) para recibir y tratar especímenes, preparación, coloración y otras técnicas de rutina (b) el estudio de frotis seleccionado de cajas de demostración comenzando con casos normales.
4. Cuando debería ser el estudiante considerado como un buen candidato principiante o cuando debería ser el estudiante con entrenamiento considerado en el campo de la Citología.
5. Cuando un citólogo y un técnico en citología pueden ser considerados para seleccionar casos negativos, y cuando sus reportes positivos pueden ser de confianza.
6. Una duración mínima y óptima de tiempo debe ser considerada esencial por cada uno de los pasos mencionados de entrenamiento.
7. Una revisión de libros de texto recomendados, libros, periódicos etc., está brevemente presentada.