

# Venereal Disease Research Laboratory

## Field Consultation Services

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ONE of the objectives of the program of the Venereal Disease Research Laboratory of the Public Health Service for the improvement of syphilis serology in the United States has been to enable State health department laboratories to guide and assist local laboratories. The State laboratory can serve effectively as a reference laboratory and training center only if the quality of its serologic testing is excellent. Periodic technical reviews are valuable aids in helping the State laboratory establish and maintain a satisfactory testing service and standardization program.

In 1951, the Venereal Disease Research Laboratory expanded its field consultation services. During fiscal years 1952-56, activities included consultative visits to State health department laboratories for the purpose of reviewing their serology activities and control programs, furnishing assistance to these laboratories for field refresher training courses or workshops in syphilis serology, and inspection of the serologic testing activities of Public Health Service hospital and clinic facilities.

During fiscal years 1952 and 1953, consultative, or laboratory inspection, visits were part of a program review monitored by the Communicable Disease Center of the Public Health Service, wherein selected areas of laboratory

activity were reviewed cooperatively by the Venereal Disease Research Laboratory and the Communicable Disease Center.

In fiscal years 1954-56, laboratory inspection visits were made only at the request and invitation of the State health officer or State laboratory director. Within a short time after each visit, the consultant sent a written report of observations, commendations, and recommendations for change, if any, to the State laboratory director, the State health officer, and the Public Health Service regional medical director.

During 1952-56, the period covered by this report, inspection reviews of central health department laboratories were made in 46 States, the District of Columbia, Alaska, Puerto Rico, and the Virgin Islands. Twelve laboratories were reviewed once; 23, twice; and 15, three times. Since December 1954 visits have been made to the laboratories of 24 Public Health Service hospitals and clinics which perform serologic tests for syphilis.

During the period 1952-56, assistance was given to 27 State health departments in conducting 61 field refresher training courses. Twenty States or Territories were visited once; 5, twice; and 2, three times. Approximately 2,000 technical workers, representing 1,000 laboratories, attended these refresher training courses. For practical reasons, technical reviews and field refresher training courses in the same State are frequently combined, and visits are made to the Public Health Service activities in the same area.

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## Consultative Visits

Consultative visits pursue the following course: Observations are made of physical quarters and working conditions; equipment and glassware; handling of specimens, reports, and records in relation to the test load and the routine sequence of testing; cleaning of glassware; methods of controlling antigens and test reagents; test performance of each procedure for the examination of blood and spinal fluid; established test controls; and the standardization or control program—training, laboratory inspection, interlaboratory evaluation studies, and so on—extended to other laboratories in the State.

The practical aspects of each situation form the bases for suggestions for change or improvement. If test results are not predictably reliable because of some condition or practice in the laboratory, this is pointed out by the consultant. For example, certain serologic tests for syphilis must be performed at room temperatures between 73° and 85° F. in order to obtain valid results. If the temperature in the laboratory is higher or lower than this during certain seasons of the year, the consultant may recommend that air-conditioning or an adequate heating system be installed.

If incorrect test results are being reported because bacterially contaminated spinal fluids are being tested, the consultant suggests that grossly contaminated spinal fluids not be tested but that they be reported as "unsatisfactory for testing." He also explains the preparation and use of tubes containing merthiolate to prevent bacterial contamination of spinal fluid.

Results of tests performed by the visited laboratory on VDRL dehydrated control serums, which have an established reactivity pattern, offer the consultant an immediate check on reactivity levels. Significant differences between the laboratory's test results and the established pattern of the control serums can usually be resolved on the basis of test mechanics, antigens, reading levels, or glassware by actual comparative testing during inspection. Discrepancies in test results are sometimes due to outdated techniques or to the use of an antigen prepared by an old technique or formula.

Practical on-the-job training of laboratory

personnel is undertaken when the laboratory director so desires and when time is available. The purpose of this training may be improvement of the technical performance of tests in current use or the demonstration of new techniques and methods, or both. Sometimes changing to a different method of testing offers advantages under the particular circumstances in a laboratory. For example, if the laboratory performs a large number of quantitative tests daily, the consultant may recommend changing from a tube testing procedure to one of the slide quantitative procedures that will result in a lighter workload without sacrificing accuracy of results.

All on-the-job training and recommendations pertaining to testing procedures adhere strictly to the directions given in the 1955 Manual of Serologic Tests for Syphilis (*1*). This manual contains general information on testing procedures and specific techniques for each of the serologic tests for syphilis most widely used in America. The manual was compiled by the Venereal Disease Research Laboratory in cooperation with the author-serologists and is available to all laboratories in the country.

Venereal Disease Research Laboratory consultants frequently suggest that one or more of the serologists from a State health department laboratory attend a refresher training course in syphilis serology at the Venereal Disease Research Laboratory. This does not necessarily mean that the State laboratory's current test performance is poor. More often it indicates that a serologist shows promise and that the laboratory would benefit by the additional training he would receive. For example, the serologist may perform the tests in current use in the State laboratory satisfactorily but may not have had experience with any other test procedure. By attending a refresher course, he may gain a working knowledge of other tests that he can use in local laboratories in his State and in providing training in these techniques and in evaluating the performance of these tests when visiting laboratories. Or the consultant may feel that the statewide standardization program could be improved by the use of a better designed evaluation study. If so, he recommends that the State serologists attend a course in management and control of

syphilis given by the regional laboratory at the Venereal Disease Research Laboratory.

During consultative visits, the program of the State laboratory for the improvement and standardization of syphilis serology within the State is critically reviewed. Ideally, these State programs include an intrastate serology evaluation study, consultative visits to participating laboratories, and provision for training in syphilis serology. Some States offer additional services such as the distribution of standardized antigens, reagents, and controls. Each part of the program is reviewed in detail and its practical aspects are considered, as well as the limitations imposed by the funds and personnel available to the State laboratory for these additional services and the number and geographic distribution of laboratories within the State.

When an inspection visit is completed, the consultant reviews all recommendations with the director of the State health department laboratory and, unless the director objects, with the senior serologists. He also discusses a summary of the findings and general recommendations with the State health officer in the presence of the State laboratory director. Finally, the consultant submits to the State health officer and the regional medical director a written report of his observations, listing the commendable features of the existing program of the laboratory and suggesting ways of improving the weak features.

### **Field Refresher Courses**

During the past 5 years, representatives from the Venereal Disease Research Laboratory have conducted or assisted with 61 field refresher courses in 27 States. These courses are presented as a function of the State health department laboratory program, and the position of the Venereal Disease Research Laboratory representative is clearly defined to the participants as that of a consultant to or member of the State laboratory team. The director of the State laboratory and key personnel from the serology section take an active part in the courses. Serologists from the State laboratory usually take part in the test presentations and perform the demonstrations.

One objective of the Public Health Service consultant is to assist in defining the position of the State laboratory as a reference and training center for other laboratories in the State. He draws attention to the laboratory practices of the State laboratory and refers to services that are available to local laboratories. If the State has a laboratory-approval program, time is usually allowed in the schedule for describing this program and for questions and discussion. The protocol for the State evaluation survey in syphilis serology and the method used for analyzing results are usually discussed, since they are of general interest.

Field refresher courses in syphilis serology are in two general categories: (*a*) a lecture demonstration, in which each test is discussed, the technique demonstrated, and the technologists given an opportunity to observe completed tests and make comparative readings; and (*b*) a participation-type workshop with the same presentation method, followed by actual test performance by the registrants under supervision.

In States which have a well-established standardization program in syphilis serology, the lecture-demonstration type of course is used to illustrate the correct method of performing tests in current use, to stimulate interest in new test procedures, to emphasize the precautions and controls that are essential for obtaining reliable test results, and to suggest further practical training and experience that may be obtained in the State laboratory. The participation-type course, using the "workshop" approach, has been preferable when the State does not have a standardization program or is in the process of initiating one.

When further basic instruction of local laboratory workers is needed, the State laboratory personnel can be indoctrinated into the techniques of practical training and supervision by assisting with preparations, demonstrations, and instruction. In several instances the lecture-demonstration part of the course has been followed by a half-day period during which the participants actually performed the tests of their choice under supervision of the State and consultant serologists. In one instance, this workshop type of refresher course served as orientation for State laboratory personnel who

later conducted a series of workshops at other places within the State.

There has been no single pattern for the field refresher training courses in serology since it has been necessary to design courses to meet the particular needs of each State. The consultant from the Venereal Disease Research Laboratory and the State laboratory director or senior serologists, or both, formulate a plan for these courses by means of a conference or, more frequently, by correspondence. Final organization, promotion, and publicity are the responsibility of the State laboratory.

The State health department laboratory sponsors the field refresher training course but may ask other groups, such as clinical pathologist and technologist organizations or a university, to act as co-sponsors. By discussing plans with these groups and securing their cooperation, valuable assistance is frequently obtained in the promotion of the training courses within these organizations and in encouraging technologists under their direction to attend. The content of a training course is usually determined by the tests in local use and those that the State health department wishes to advance.

Program plans differ according to the number and kinds of tests to be demonstrated and the manner of their presentation. Training courses have varied in length from 1 to 5 days. In some States, a single course has been given in the city where the State public health laboratory is located. In other States, courses have been held at several different places in order that technologists from more laboratories might attend. As many as eight courses have been conducted in a State during the visit of a consultant. Courses are scheduled to meet the convenience of the local laboratories and are frequently held in the evening or on weekends. This practice has more than doubled attendance in some instances.

In one State, a series of courses has been held in different areas at yearly intervals. In another State, courses were held in 3 successive years. The first year, formal refresher courses were held in the two largest cities in the State. The second year, a series of 4 practical "benchwork" courses were held on 4 successive Saturdays in the State health department laboratory. The third year, a serology conference

was held to discuss changes in the new Manual of Serologic Tests for Syphilis (1), the development of tests using treponemal antigens, and a problem clinic. In this way, training courses in syphilis serology were integrated into a continuous, progressive, training program.

The need for repetition of refresher courses in serology is determined by the new material to be presented and the turnover in personnel in local laboratories. During the past 5 years there have been many changes in the routine tests used for syphilis serology, with a shift from tests using lipoidal antigens to those using cardiolipin antigens. The turnover in personnel in local laboratories in many States is continuous and fairly rapid.

### **PHS Laboratories**

Since December 1954, the program for standardization of serologic tests for syphilis in the laboratories of Public Health Service hospitals and clinics has included consultative visits by Venereal Disease Research Laboratory representatives to the 24 facilities in which these tests were being performed. In most of these laboratories, on-the-job training, in addition to a technical review of test performance, was accomplished during the visit. On-the-job training was especially indicated on the first visits because of changes in the official serologic testing methods. Many of the laboratories needed assistance in preparing orders for equipment and in training technicians in the newly prescribed test techniques.

Because laboratories in Public Health Service hospitals and clinics receive antigens and other serologic reagents from the Venereal Disease Research Laboratory, and because an evaluation study has been established to determine the proficiency with which the serologic tests for syphilis are being performed at these laboratories, future inspection visits and on-the-job training will be facilitated and expedited.

### **Discussion**

In general, the objectives of technical and program reviews of State health department

laboratories by consultants from the Venereal Disease Research Laboratory have been to commend the outstanding good features of the activities and program in syphilis serology and to offer constructive suggestions for improving weak features. Particular attention has been paid to intrastate programs for standardization of test performance since the development of these programs is an essential part of the national program. Any comprehensive plan for improvement in syphilis serology must include consideration of test performance in the local laboratory since the State laboratory usually performs only a fraction of the total tests for syphilis performed in a State.

Because the problems encountered by State health department laboratories may arise from differences in geographic locations, working conditions, and budgetary limitations, recommendations for change must be tailor-made for each laboratory. Some laboratory directors have used the recommendations of consultants regarding adequacy of laboratory facilities, equipment, glassware, air-conditioning, and personnel in preparing budget requests. For the most part, consultants' suggestions have been well received by the laboratories. Most of the recommendations made during these visits are accepted and further suggestions are usually welcomed.

In the past 5 years, with the adoption of newer and simpler testing techniques in syphilis serology, there has been a marked change in routine testing operations. The training of serologists accomplished during visits of Venereal Disease Research Laboratory consultants to their laboratories has been valuable in this transition period.

Field refresher training courses in syphilis serology have enabled State health department laboratories to increase their accomplishments in this essential phase of State standardization programs in syphilis serology. As a part of the State programs, these refresher courses or workshops have had the following results:

1. Performance of serologic tests for syphilis has improved.
2. Modern testing methods with cardiolipin antigens have been generally adopted.
3. The position of the State health department laboratory as a reference laboratory and

training center has been emphasized and a closer working relationship with local laboratories has developed.

Indirectly, the field refresher training courses have also been utilized in training medical technologists and public health laboratory workers in universities, colleges, and hospitals. Instructors from teaching institutions frequently attend these field courses. In several instances, they have requested and received additional training in courses at the Venereal Disease Research Laboratory. In one State, a workshop in syphilis serology was recently conducted for college and university instructors in clinical laboratory technology and public health bacteriology.

Consultative visits to State public health laboratories integrate the activities of the Public Health Service Venereal Disease Research Laboratory with these State laboratories. The program of the Venereal Disease Research Laboratory for the improvement and standardization of syphilis serology has been applied by many State laboratories. The State and Territorial health department laboratories are continually improving and modernizing their own testing operations and, by working with local laboratories, have helped the local laboratories to attain dependable performance of serologic tests for syphilis.

### Summary

The field consultation services of the Venereal Disease Research Laboratory of the Public Health Service during a 5-year period which includes the fiscal year 1956 have included reviewing the syphilis serology activities and programs of the State health department laboratories, assisting States in field refresher training courses or workshops in syphilis serology, and inspecting serologic testing in Public Health Service hospital and clinic facilities. Utilizing such services has aided State health department laboratories to develop statewide programs for the standardization and control of syphilis serology.

### REFERENCE

- (1) Public Health Service: Serologic tests for syphilis. 1955 manual. PHS Pub. No. 411. Washington, D. C., U. S. Government Printing Office, 1955.