Problems, Personnel, and Proficiency of Small Hospital Laboratories

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Continuing Education for Laboratory Personnel, a project of the Washington/Alaska Regional Medical Program, brought workers to 18 established centers for 5 to 15 days of one-to-one, preceptor-guided training

THE REGIONAL MEDICAL PROGRAMS (RMP), established by legislation passed in 1964, focused on postgraduate continuing education in medicine directed mainly at physicians. Similar attempts to extend this priority to the allied health field elicited considerable discussion, but only a few efforts are noteworthy.

This final report follows a preliminary report (*1*) of an allied health project of the Regional Medical Program for Washington and Alaska entitled, "Continuing Education of Laboratory Personnel." The project existed for 5½ years and gained the participation of 67 percent of the 135 hospital laboratories whose employees were the target group of the project. Staff of Federal and State institutions were excluded from the project. It cost $208,000 and provided 1,326 training days for individual trainees, plus five major seminars for approximately 500 technologists and technicians. Objective measurements of proficiency were taken over a 3-year period of 42 laboratories of small hospitals having 100 beds or less. The measurements were obtained from returns of the Basic A Quality Control Program of the College of American Pathologists (CAP).

In 1967, one author, RAF, performed an on-site survey of the clinical laboratories of approximately 50 percent of the hospitals having 100 beds or less in Alaska and Washington. Of the 135 hospitals in the two States, 66 percent had

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The project was supported by grant No. 5603 RM 00038, project No. 07 from the Regional Medical Program Service, Health Services and Mental Health Administration. During its closing phase, it was assisted by short-term temporary funding from the Regional Medical Program Service.

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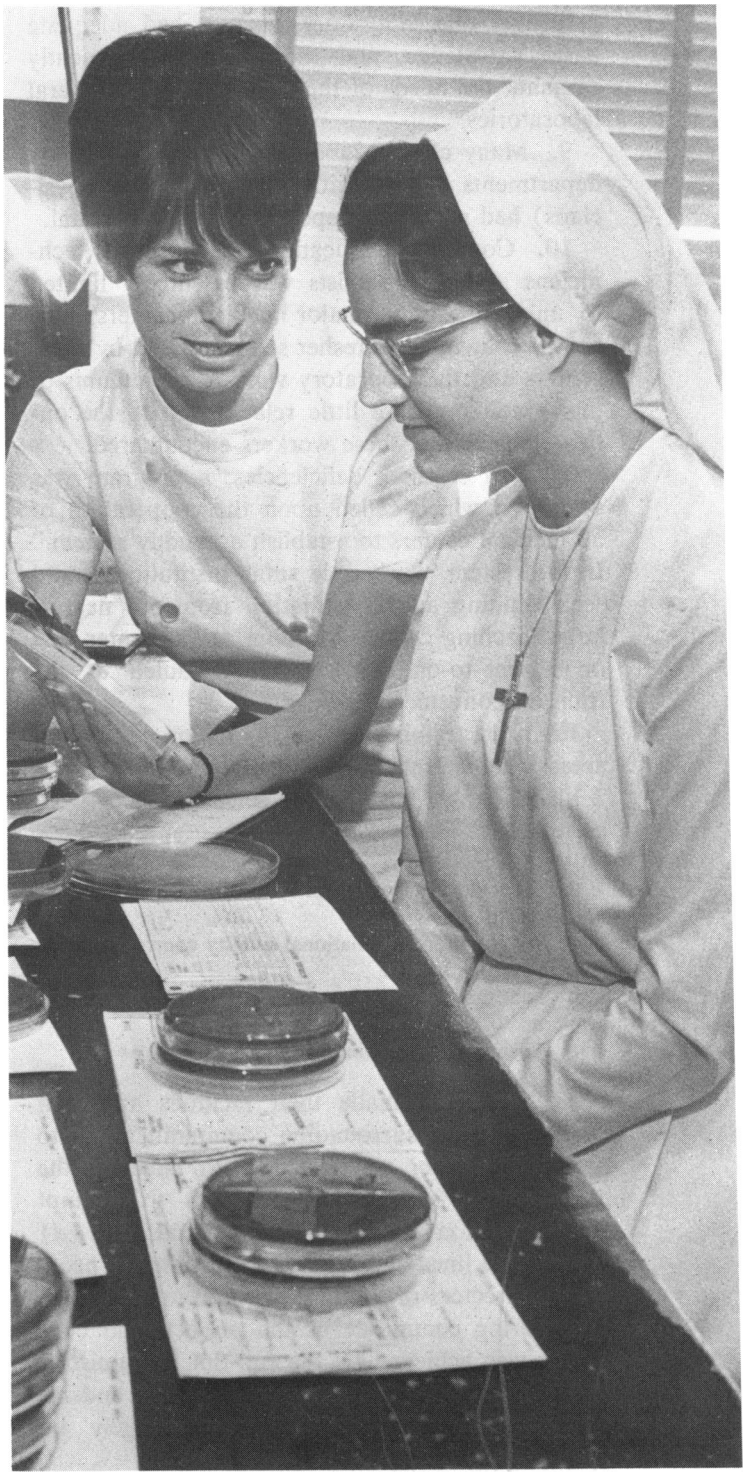
100 or less beds, a percentage that approximates the national average (*2*). The results follow:

1. Most laboratory personnel had no access to means of improving their knowledge and skills unless they were supervised by a pathology group. (These are private firms which also provide consultant services under contracts with hospitals.)
2. A major mode of learning new techniques was by job hopping.
3. Formal educational background in laboratory work was limited in the groups surveyed.
4. Formal quality control, routine instrument maintenance, adequate laboratory facilities, recordkeeping, or adequate knowledge of bacteriology and proper bacteriological materials essentially did not exist.
5. Isolation from educational facilities meant staff had no way to correct their deficiencies.
6. Many hospital administrators had no technical background and judged the effectiveness of their laboratories through profit and loss statements or complaints of the medical staff, or both.
7. Clinical physicians generally assumed that accuracy and precision existed and judged the effectiveness of the laboratory through its speed, availability, and price for services.
8. At the academic or governmental level the designers of allied health education programs



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Trainee from Providence Hospital, Anchorage, Alaska, (right) is given instructions by the supervisor of the microbiology department of King County Hospital, Seattle, Wash.

presumed that laboratory workers had adequate basic knowledge, and the programs frequently overshot the needs of the personnel in peripheral laboratories.

9. Many clinical laboratories (one of the few departments dealing with all patients and physicians) had no medical spokeman in the hospital.

10. Continuing education of laboratory technicians and technologists was essentially limited to universities and major medical centers. The course content of refresher seminars held by these centers and the laboratory worker curriculums of junior colleges bore little relationship to the on-the-job problems these workers encountered.

To correct these deficiencies, a program was organized which called upon the cooperation of all medical centers to establish a "buddy system." In the system, workers in small institutions could seek training and consultation from the nearest large teaching center. Training at the center was on a one-to-one basis and scheduled at the trainee's convenience.

Eighteen training centers in major population areas were selected, including 16 hospitals and 2 blood banks. Criteria for selecting them were as follows:

1. Laboratory accreditation by the College of American Pathologists
2. Participation in a national quality control program with proved excellence
3. The presence of a medical technology training program
4. An onsite evaluation by RAF.

These centers made their facilities and staff available to the surrounding communities (*a*) to provide refresher training, (*b*) to facilitate the institution of new procedures, (*c*) to attempt standardization of laboratory techniques, and (*d*) to establish lines of consultation in times of need.

The directors of the 18 training centers formed the steering committee of the project, and continuity was achieved by the full-time administrative assistant, VEH, to whose dedication and interest the program's success can largely be attributed.

Refresher courses lasting 5 to 15 days in the major fields of chemistry, hematology, microbiology, blood banking, and cytology were offered at a time convenient to the trainee. The trainee selected the area of interest and defined his needs; however, his choice of courses had to be consistent with the instrumentation available in the technician's laboratory in order to be acceptable for training. Scheduling was arranged by the administrative assistant. The project provided transportation and per diem reimbursement to the trainee as well as a stipend to the training center to cover the costs of the session.

The trainee was asked to evaluate the training after 3 months, and after 6 months the training center evaluated the trainee and the program from its viewpoint.

A locum tenens was added to the program in 1970 in order to free trainees in isolated one-man laboratories. The locum tenens' experience working in various laboratories also yielded a wealth of information to complete the profile of the laboratories, their personnel, and the attitudes of hospital administrators. This service proved too expensive to continue after 1971.

In the third year, a proficiency testing program was initiated which, during 1971, 1972, and 1973 enrolled 42 small institutions in the CAP's quality control program.

This program is a quarterly national testing service in which samples are sent to participating laboratories. The test results and the methods used for analysis are submitted to the CAP for evaluation against the performance of reference laboratories. The limits of acceptable performance are based on values submitted by peer group members, using an equivalent method. The results for each method are used to calculate the mean and standard deviation (SD). Values outside $\pm$ 3.0 SD of the mean are excluded, and the mean and SD are recalculated, using the remaining values. Good performance represents the range of values within $\pm$ 1.0 SD of the mean; acceptable performance within $\pm$ 2 SD of the mean. Values outside these limits are rated as unacceptable.

The data derived from this testing service were analyzed by VEH for relationships between performance of laboratories and the hospital's size, extent of the staff's training and background, presence or absence of professional supervision, and the impact of continued participation in the CAP testing program. The results were reviewed by the director. We had planned a more positive entree into quality control, using this technique as a means of detecting areas of deficiencies. However, termination of the RMP budgeting, effective in June 1973, stalled the new proposal, and at this time its future remains uncertain.

Results of the Project

Locum tenens' onsite evaluations, 1970 and 1971. Following are findings for 31 laboratories resulting from the locum tenens' working experiences and visits:

1. Technologists and technicians were eager to participate in a continuing education program.
2. Ninety percent of the working force questioned had not attended an educational program within the past 5 years.
3. Fifteen laboratories had no quality control program.
4. Four laboratories had the quarterly College of American Pathologists' proficiency testing program as their only means of quality control.
5. Four other laboratories had initiated additional quality control, but recordkeeping was insufficient to permit evaluation of performance.
6. Equipment was obsolete, in need of repair or maintenance, or operated under suboptimal conditions in many facilities. No maintenance or calibration records could be produced. No funds were available for new books, journals, new equipment, or adequate consultation in 25 of 31 institutions. In one instance, a textbook was requested from the RMP because of a lack of funds within the hospital.
7. Eight laboratories were reconverted closets.
8. New methods were either introduced by contact with manufacturers' representatives or by new employees.
9. No consultations with medical center laboratories occurred.
10. Hospitals administrators had no criticisms of the quality of work. Major areas of their concern were budgets, overtime, and availability of technicians and technologists 24 hours a day.

Trainees. This project elicited uniform interest and participation throughout Alaska and Washington. Among hospitals with 74 beds or less, 100 percent of those in Alaska and 76 percent of those in Washington participated (fig. 1). Of the hospitals with 75 or more beds, 48 percent participated.

The project commenced in 1968. Figure 2 illustrates that approximately 25 percent of trainees returned each year; the remaining 75 percent were new participants. The increased overall activity noted in 1970 coincided with the activities of the locum tenens and the decline in 1971, with threatened termination of funding. Attempts to achieve funding from the participating hospitals were fruitless because of their limited resources.

About 17 percent of the trainees had had no formal training. Military trainees comprised 11.9 percent of the group; however, the quality of their

Figure 1. Participation of hospitals in Washington and Alaska according to number of beds

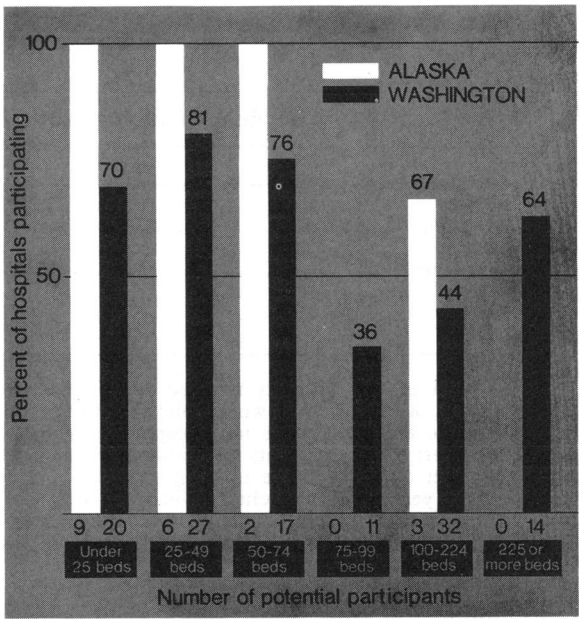
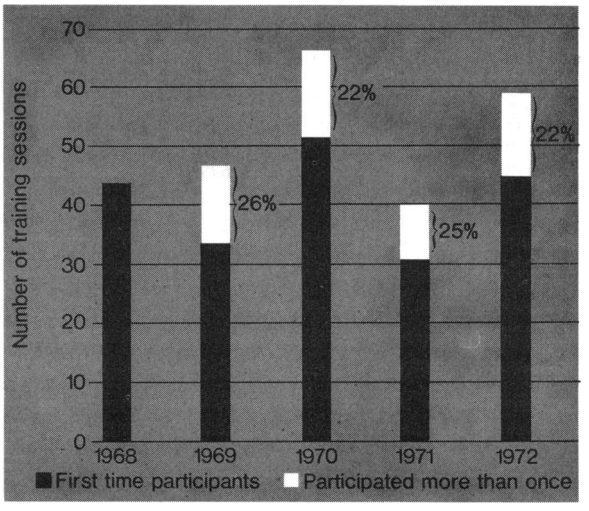


Figure 2. Participants who returned for training in other subjects, by year



experience and training varied with the location and length of their duty assignments. The distribution of educational background in laboratory work follows:

Background	*Percent of trainees*
No formal training	17.3
Military training	11.9
Formal training:	
1 year or less	34.2
2 years	9.6
3 years	3.8
4 years or more	20.4
No information	2.8
Total	100.0

Of the 435 requests for courses, microbiology was the most popular, representing 24.8 percent of the total (table 1). Next in popularity were blood banking (23.2 percent), hematology (18.9 percent), and clinical chemistry (16.8 percent). The length of the training periods requested for microbiology and blood banking was longer than for the other courses.

Proficiency testing. With the accumulation of data resulting from our sponsorship of the CAP proficiency testing program in 1971, it became evident that the participating clinical laboratories in the two States could be divided into three cate-

Table 1. Training requests according to subject, 1968–72

Subject	1968	1969	1970	1971	1972	Total[1]
Microbiology	27	23	25	12	19	108
Blood banking	18	19	27	20	17	101
Hematology	27	12	15	12	17	83
Clinical chemistry	30	17	14	5	8	74
Parasitology	12	1	5	2	3	23
Immunology	9	2	3	1	1	16
Other[2]	4	4	15	3	4	30

[1] The total of 435 requests resulted in 255 training sessions. Not all applicants were able to arrange for training; some applicants were not acceptable for 1 reason or another; some applicants were able to cover more than 1 subject during a single training session.

[2] For the 5 years, "other" included—in 1968 equipment observation, pregnancy tests, cytology, and tissue work—in 1969 cytogenetics, use of controls, electrophoresis, and medical photography—in 1970 histology (2 sessions), cytology (2 sessions), isotopes, electrophoresis, instruction in IL blood gas setup and maintenance (2 sessions), administration, respiratory measurement equipment, medical photography, quality control reporting (2 sessions), coagulation, and 1 subject unidentified—in 1971 laboratory management (2 sessions) and urinalysis—in 1972 cytology, histology, radioisotopes, and arterial puncture.

Table 2. Average scores in the College of American Pathologists' quality control program for all laboratories, all years

Laboratories and year	Number of hospitals	Number of tests	Performance ratings (percent)					
			Good	Range of good	Acceptable	Range of acceptable	Not acceptable	Range of not acceptable
Group 1:								
1971	6	701	74.2	51.2–86.8	15.6	8.9–25.8	10.2	2.6–26.9
1972	7	1,282	73.8	56.4–91.4	13.0	4.3–32.7	13.2	0 –28.9
1973[1]	6	627	73.8	56.2–86.0	13.3	3.8–27.1	12.8	6.0–32.7
Group 2:								
1971	6	855	69.9	48.4–85.3	17.8	8.7–31.3	12.3	2.0–30.3
1972	8	1,646	78.8	60.0–90.5	13.5	2.4–27.3	7.7	0 –16.4
1973[1]	30	3,679	79.6	66.0–90.6	13.5	8.0–20.0	6.9	0 –19.9
Group 3:[2]								
Overall performance for 1971–73	9	3,840	80.0	.....	13.0	.....	7.0	.....
Not acceptable for—								
1970							7.3	.....
1971							7.4	.....
1972							6.9	.....

[1] Only for 3 quarters of the year.

[2] Data on group 3 submitted for our use were rounded to the nearest hundredth and compiled for all 3 years. Charts were included that allowed us to formulate the breakdown by year only for not acceptable performance.

NOTE: Group 1 institutions had no pathology consultation; group 2 had limited pathology consultation; group 3, the control group, had pathology consultation including quality control programs.

Table 3. Average scores in the College of American Pathologists' quality control program for all laboratories participating 2 or more years

Laboratories and year	Number of hospitals	Number of tests	Performance ratings (percent)					
			Good	Range of good	Acceptable	Range of acceptable	Not acceptable	Range of not acceptable
Group 1:								
1971.....	7	839	74.1	51.2–86.8	15.9	8.7–25.8	10.0	2.4–26.9
1972.....	6	1,132	74.3	56.7–91.4	12.9	4.3–32.7	12.8	2.0–28.9
1973 [1].....	3	327	69.6	56.2–87.8	13.2	8.0–27.1	17.2	6.2–32.7
Group 2:								
1971.....	4	574	75.0	63.0–85.3	15.8	8.7–26.1	9.2	2.0–20.8
1972.....	7	1,438	77.1	74.6–86.8	13.8	7.7–25.4	8.1	0 –12.9
1973 [1].....	11	1,309	80.1	72.4–90.6	12.9	5.6–20.4	6.9	0 –14.9
Group 3:								
1970.....	6	([2])	81.7	73.6–86.3	11.1	6.5–18.2	7.2	5.2–10.7
1971.....	6	([2])	80.6	69.2–85.4	12.5	7.7–15.9	6.9	3.7–16.9
1972.....	6	([2])	76.4	68.2–82.1	16.4	14.5–19.3	7.2	3.4–12.5

[1] Only for 3 quarters of the year.
[2] Unknown.
NOTE: Group 1 institutions had no pathology consultation; group 2 had limited pathology consultation; group 3, the control group, had active pathology consultation including quality control programs.

gories according to the form of outside consultation provided.

Group 1. Institutions with no pathology consultation
Group 2. Institutions with limited pathology (tissue only) consultation
Group 3. Institutions with active pathology consultation, including quality control programs.

Forty-two out of a possible 92 institutions with 100 beds or less participated in the basic A, CAP series during 1971, 1972, and 1973. Some laboratories participated more than 1 year, for the total of 65 surveys. The 65 surveys performed over a 3-year period represent 8,984 individual laboratory tests in the fields of chemistry, blood banking, hematology, microbiology, urinalysis, and serology. Institutions supervised by pathology groups with formal quality control programs were not included in the analysis, but their proficiency testing data were made available to us, and they formed our control group, group 3.

In both group 1 (institutions without pathology consultation) and group 2 (those with tissue pathology consultation only), the hospital administrator or a member of the medical staff was the nominal supervisor of the clinical laboratory.

Tables 2 and 3 present the performance of the participating and control group laboratories in percentages of the test results rated good, acceptable, and not acceptable. In table 2, the average performances of the three groups are compared, regardless of length of participation. In the first year unacceptable performance (>2, SD) of the laboratories was 10.2 percent for group 1, 12.3 percent for group 2, and 7.3 for group 3. No improvement was exhibited by group 1 institutions, with 13.2 percent and 12.8 percent unacceptable performance in the second and third years. For the group 2 institutions, unacceptable performance declined to 7.7 and 6.9 for the second and third years. There was no change in the control group.

Table 3 contains performance data for only those institutions which participated for more than 1 year in the testing program. Again, group 1 institutions failed to improve, exhibiting 10.0, 12.8, and 17.2 percent unacceptable performance over the 3 years. Group 2 institutions showed definite improvement, with 9.2, 8.1, and 6.9 percent unacceptable performance during the same period. It should be noted that only three hospitals remained in group 1 by the third year. Many had acquired professional supervision by that time and were added to group 2.

This preceptor program, which included per diem and transportation expenses for the trainee and a stipend for the training center, had an average cost of $65 per training day for Washington and Alaska (table 4). The actual costs of providing training in Alaska were about 40 percent higher than for Washington; however, this sum was offset by the greater number of hospitals and trainees from Washington. Alaska supplied 17 percent of the trainees, although its population was only 8.0 percent of the combined population.

Table 4. Chronology of the program and costs per trainee, 1969–72

Year	Training sessions	Training days	Average training days per trainee	Average costs [1]	
				Per trainee	Per training day
			Total program		
1968	42	228	5.4	$311	$57
1969	48	247	5.2	322	63
1970	67	335	5.0	343	69
1971	40	244	6.1	434	71
1972	58	272	4.7	314	67
Total	255	1,326	5.3	$345	$65
			By State		
1968:					
Alaska	12	104	9.0	$433	[2] $50
Washington	30	124	4.1	262	63
1969:					
Alaska	10	78	7.8	443	[3] 57
Washington	38	169	4.4	293	66
1970:					
Alaska	6	43	7.2	669	109
Washington	61	292	4.8	300	63
1971:					
Alaska	6	49	8.2	992	121
Washington	34	195	5.7	336	59
1972:					
Alaska	9	35	3.8	337	98
Washington	49	237	4.8	302	63

[1] Includes per diem, travel, and training center costs.
[2] This low cost reflects 47 days of onsite training for which no training center costs were accrued. Salaries of 2 persons giving onsite training were paid by the hospitals benefiting.
[3] 35 days of onsite training accounts for the low cost.

Discussion

This project, which was directed at meeting the educational needs of personnel in laboratories of hospitals with 100 beds or less, elicited participation from 100 percent of Alaska's hospitals and 76 percent of those of Washington over the 5½ years (fig. 1). Each year 25 percent of all participants returned for additional sessions (fig. 2) and, in addition, telephone communication between the training centers and the trainees in times of need was a beneficial spinoff. Approximately 50 percent of the total working force in the laboratories of the target hospitals was mobilized and involved in an educational experience which was the first of its kind.

The success of stimulating this degree of interest rested on three factors:

1. Training on a one-to-one basis
2. Education in the friendly environment of a training center laboratory whose staff had planned for the visit, with reimbursement for the center
3. Reimbursement of the trainee for per diem and transportation expenses.

The reimbursement of preceptors for per diem and transportation has been a controversial issue as it applies to practicing physicians in view of their income. However, the success of this project is, in large part, attributed to the use of per diem and transportation reimbursement to assist the trainee who, without some financial assistance, would be unable to support travel and per diem expense. These observations are supported by the personal comments of Dr. David Lackman, director of laboratories, State Health Department of Montana, who noted in September 1973 that conferences sponsored by his department offering per diem and transportation were those faced with overflow enrollment.

The use of existing medical centers with ongoing operations and training techniques was an important innovation, since it did not obligate the program to set up expensive faculties or laboratory facilities which are fragile to unexpected budgetary manipulations. The training center stipend paid by the project obligated the center to provide a worthwhile educational experience.

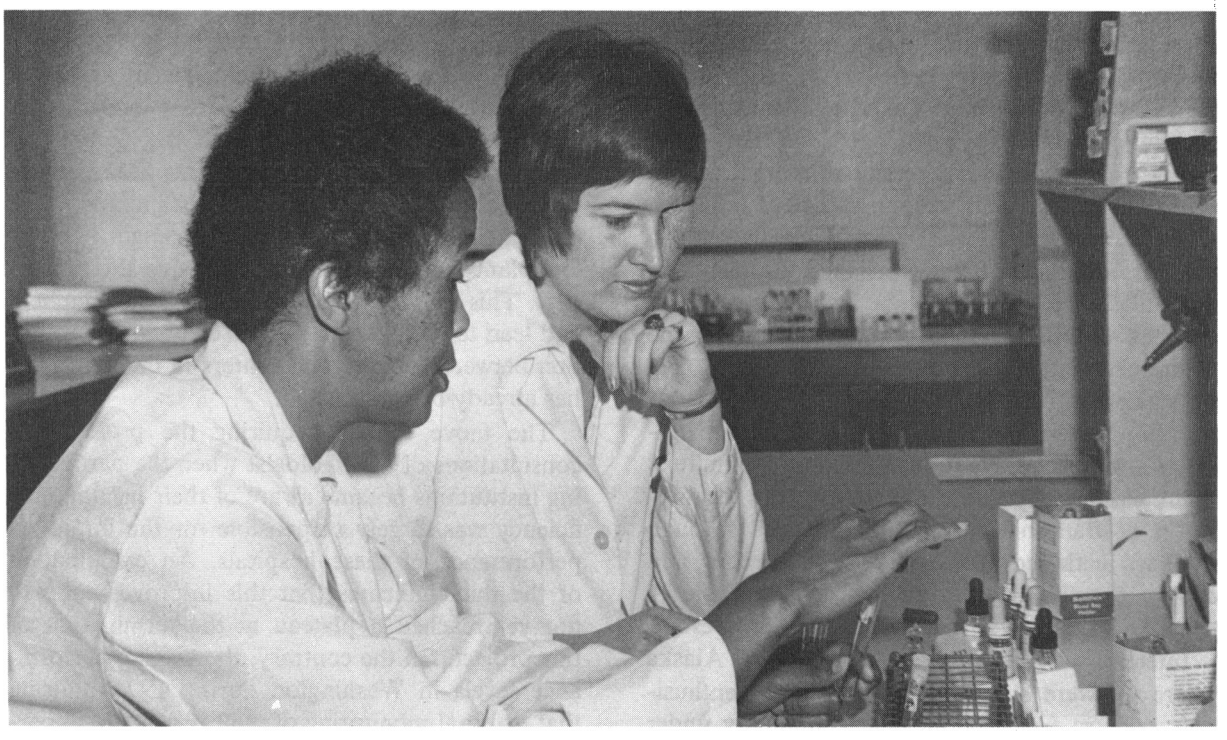
The costs of training outlined in table 4 are relatively low and compare favorably to the daily cost of training in any public institution. However, community colleges and other public institutions could not offer the scope of opportunity on a one-to-one basis for such sums.

At the conception of the project the advisory committee questioned the advisability of spending time and effort on trainees with limited formal training. At the time, we were aware that some laboratory personnel did have limited backgrounds, but data collected during the project revealed the lack of training to be widespread and, as indicated earlier, only 20 percent had completed a formal 4-year program.

Microbiology and blood banking were the most frequently requested courses. These subjects are the most difficult to learn without tutoring. Also, blood banking activities, because of the possibly fatal consequences of mistakes, are the most threatening tasks of the clinical laboratory. Participants with less training gravitated to these more critical programs, indicating a desire to improve their basic knowledge.

In addition, we called upon the centers to use their student grading system to evaluate our trainees. We assumed that medical center laboratories and blood banks with large staffs and teaching experience should be able to judge adequately the performance of an outside technician over a 5- to 15-day period. Most trainees received an average or better rating from the teaching supervisors, who considered them capable, eager to learn, and well worth the effort. At the King County Blood Bank, where strict supervision was maintained, trainees successfully competed for grades with college students in the medical technology training program of the University of Washington. We concluded that members of our target group were not only interested in improving, but they also had the ability to learn.

During the original survey the educational opportunities available to laboratory personnel were reviewed. A list of seminars and symposiums offered by universities, medical centers, instrument manufacturers, and government-sponsored agencies, such as the Center for Disease Control, included numerous sophisticated sessions directed at people with adequate technical background. However, 51.1 percent of our trainees had less than 1 year of formal training, and it is obvious that these seminars do little to fill the basic needs of these technicians.



At the King County Blood Bank in Seattle, Wash., one of the training centers, the teaching supervisor (left) works with a medical technologist from St. Joseph's Hospital, Tacoma, Wash.

Therefore, an underlying system of education which emphasizes specific, basic information such as proper dishwashing procedures, instrument selection and maintenance, incubator and refrigerator temperature calibration, quality control, and proper pipette procedures is essential because these matters are frequently overlooked by personnel with limited training. Even staff with full training tend to become lax in performing these procedures if supervision is minimal or absent. Without these basics, quality control is poor, as demonstrated by the proficiency data we have reported in this paper.

Pathology groups provide the only form of comprehensive consultation to hospital laboratories in Washington and Alaska, and the quality of the relationship with particular institutions depends upon the extent to which the administrator will defer the actual management of the laboratory to the pathologist. In the majority of hospitals in this project, the administrator directed the laboratory, or he sought out a pathologist, in name only, to satisfy the regulations of the Joint Commission on Hospital Accreditation. The general opinion was that this requirement increased the expense to the hospital needlessly, and the consulting pathologist was prevented from taking an active part in the management of the clinical laboratory. In some situations, the laboratory technologist possessed knowledge to improve laboratory performance but lacked the authority to influence the administrator or the hospital board. The pathologist, on the other hand, occasionally could recruit support from the medical staff and thus acquire sufficient influence to guide the hospital laboratory.

Most administrators are trained businessmen with little technical experience and are frequently unaware of the technical pitfalls confronting the laboratory staff. In the beginning of this project we approached the Washington State Hospital Association and requested it to name an administrator as a representative for our advisory committee. There was no response. Subsequently, the accumulation of data on hospital laboratories through statistics gathered from our onsite surveys and our sponsorship of the quality control basic A program of the CAP generated some interest.

Interest was particularly evident in Alaska where we were able to enlist active and enthusiastic support from the medical community under the leadership of the Alaska Hospital Association. This manifestation of concern has resulted in phenomenal improvement in proficiency; the unacceptable performance rate for Alaskan laboratories dropped from 12.6 percent in 1972 to 6.4 percent in 1973. By contrast, with the termination of the Washington program in mid-1973, the unacceptable performance rate increased from 6.9 percent in 1972 to 9.5 percent in 1973.

The Washington and Alaskan programs independently solicited funding from the same sources. The Alaskan program is currently functioning, having achieved funding from State and Federal sources as well as through a grant from the Kellogg Foundation. In large part this success was due to the active, aggressive support of the State's hospital association.

Outgrowths

The medical technology training program of the University of Washington was intimately associated with this project through RAF's dual role as director of both programs at the conception of the RMP project. The university's program now permits students to spend their last 3 months of training in peripheral hospitals in either State. Some of the first students have elected to stay in these rural areas. In general, the experience and contacts of the Washington/Alaska Regional Medical Program permitted the introduction of such dispersed educational experience in attempting better distribution of registered technologists in areas far from the university centers. It is hoped that this policy will help to increase the number of formally trained personnel in rural areas. However, without adequate laboratory standards, these graduates will be unable to effect changes in physical plants or the policies of operating the laboratory. This situation can demoralize staff members and lead to staff resignations. Telephone consultation between trainees and centers in times of need has already been discussed.

The move toward requiring the professional consultations of a pathologist when the participating institutions became aware of their lagging proficiency was largely responsible for the improved performance of these hospitals. An examination of the data indicates that this improvement had not yet reached a plateau at the termination of this project. On the contrary, the waning performance levels in Washington during 1973 indicate that external monitoring of quality and the opportunity for continuing education are extremely important in laboratory performance.

Conclusions

Several conclusions can be drawn from the project.

1. The complexity of the clinical laboratory is consistently underestimated by persons both in and out of the laboratory when those persons are inadequately trained.
2. A quality control program, by itself, does not assure improved performance without some expert consultation.
3. The mere presence of an expert, albeit an informal one, appears to substantially improve laboratory performance through the benefits of consultation.
4. Active consultation by a pathologist appears to improve performance further if the consulting service has reasonable authority in the management of the laboratory.
5. An active continuing education program permitting access to training centers is an essential part of laboratory management, and support for these programs must be derived from sources other than the technologists because of their expense.
6. Standards for laboratories are essential if administrators, hospital boards, and Joint Commission inspection teams are to evaluate accurately the performance of laboratories under their jurisdiction.

Through this project, we successfully provided an educational experience and improved the proficiency of the majority of the laboratory personnel in small and rural hospitals of Washington and Alaska. The data presented indicate that we were responsible for improving the performance of most laboratories through interinstitutional and agency awareness and cooperation. However, the lack of competent consultation and of standards for personnel and facilities to guide hospital administrators, hospital boards, and communities are the most significant deterrents to a solution of the problems presented in this paper.

This project dealt with only one scientific field, the clinical laboratory, which has its advance guard at the university, with its practical application extending into the rural parts of the country. Although the subject dealt with was one of the oldest allied health professions, the conclusions are applicable to any medical or nonmedical scientific field which finds its practical application at some distance from the centers of development.

REFERENCES

(*1*) Sattler, J. D.: Continuing education for lab personnel. Hospitals 47: 125,126, Mar. 1, 1973.

(*2*) Directory of institutional members, 1972. Washington State Hospital Association, Seattle, 1972.

FOUTY, ROBERT A. (Providence Hospital, Seattle), HAGGEN, VICTORY E., and SATTLER, JANIECE D.: ***Problems, personnel, and proficiency of small hospital laboratories. Public Health Reports, Vol. 89, September–October 1974, pp. 408–417.***

The purpose of this allied health project of the Washington/Alaska Regional Medical Program was to answer the educational needs of laboratory workers in hospitals having 100 beds or less. These comprise 66 percent of the hospitals in the two States. The training scheme developed for the project can be applied to other allied health personnel; faculty, libraries, and laboratories are not required, merely access to them.

The project existed for 5½ years and elicited participation from 67 percent of the 135 laboratories whose workers were the target group. Technicians were offered 5 to 15 days of preceptor-guided training at the nearest large teaching center. The 18 centers received stipends for the training and the trainees, per diem and travel payments. The project cost $208,000 and provided 1,326 training days and five major seminars for approximately 500 technologists and technicians.

The basic A series quality control program of the College of American Pathologists was used to obtain objective measurements of laboratory performance. Forty-two laboratories of hospitals with 100 beds or less participated in the program for 1, 2, or 3 years. Laboratories with outside pathology group consultants were able to decrease the percentage of test results that were not acceptable; laboratories lacking such consultation showed no improvement.

An onsite survey of the laboratories and the reports of a locum tenens, who freed workers to attend training courses, were the sources of other data on the problems and operating procedures of the small laboratories in the two States.