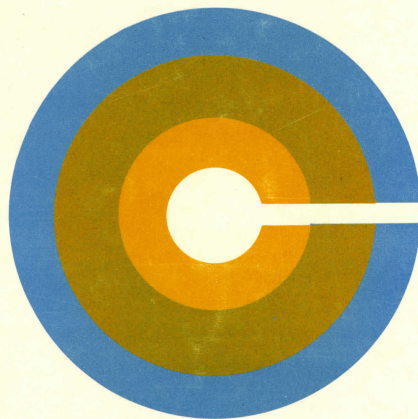




REPORT
on the
PROGRAM REVIEW
of the
MEDICAL LABORATORY TECHNOLOGY PROGRAM



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**REPORT
on the
PROGRAM REVIEW
of the
MEDICAL LABORATORY TECHNOLOGY PROGRAM**

PROGRAM REVIEW OFFICE

May, 1988

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SUMMARY

The evaluation of the Medical Laboratory Technology Program comes at an opportune time in that it highlights the critical problem of clinical placement which will be a crucial factor in the outcome of the C.M.A. accreditation process scheduled for this fall. Without permanent resolution of this problem, the program is in very real jeopardy. Other areas of concern within the program that urgently need to be addressed are the intolerable workload caused by the 1986 compression of the College portion of the program into an eight month period; the composition and function of the Advisory Committee; and problems of professional deportment that have manifested themselves in faculty, faculty-student, and faculty-hospital relations. But there is no doubt in the Program Evaluation Committee's mind that if the program is to survive, resolution of the clinical placement issue must be achieved immediately.

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(April 19, 20, 1988)

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INTRODUCTION

The Program Review process was undertaken for the Medical Laboratory Technology Program over the period December, 1987, through April, 1988. Initial data was solicited from the Divisional Director, Science/Health Sciences, in November, 1987. Questionnaires were mailed to Advisory Committee members, Clinical Education Co-ordinators, employers and former students on January 22, 1988; a second mailing took place on February 26. Current student surveys were administered on February 11, and faculty surveys were distributed on February 22. Data was finalized as of March 31. The Program Evaluation Committee met to sift and deliberate the data on April 19 and 20, 1988.

BACKGROUND

Medical Laboratory Technology was initially conceived and operated as a clinical program at Royal Inland Hospital. Later, the program was structured around a Royal Inland Hospital-British Columbia Institute of Technology affiliation. With the inception of Cariboo College, students could take a year's instruction before transferring to B.C.I.T. In 1973, Medical Laboratory Technology became a three-year program, the first two years being offered at the College, and the third year--the clinical portion--in a hospital setting. As of September, 1987, two semesters of University Transfer became a prerequisite to entry into the program and all the Medical Laboratory Technology courses, including Fundamentals and Medical Terminology, were compressed into eight months' intensive instruction, constituting the second college year. Following successful completion of the college and clinical portions of the program, students are eligible to write the Canadian Society of Laboratory Technologists (C.S.L.T.) exams. Success in these exams confers on the graduate the title "Registered Technologist" (R.T.); this qualification is normally required for employment as a Medical Laboratory Technologist in Canada.

METHODOLOGY

A wide variety of methods and materials was used to conduct the review process.

Standardized questionnaires for program review were sent to the Medical Laboratory Technology Advisory Committee members, Clinical Education Co-ordinators, employers, faculty, and current and former students.

Dr. Paul Egan, Director of Sciences/Health Sciences, provided budget information and descriptive data on the program.

Individual meetings were held with Marg Bangen, Co-ordinator, Medical Laboratory Technology, Larry Prins, Chairperson, Allied Health Sciences, and Paul Egan, Director of Sciences/Health Sciences.

The Medical Laboratory Technology Program provided a variety of materials in support of the review process:

Course outlines for the following:

Med Lab 231:	Med Lab Tech Fundamentals
	Medical Terminology
Med Lab 232:	Anatomy and Physiology
Med Lab 233:	Clinical Chemistry I
Med Lab 234:	Hematology I
Med Lab 237:	Immunology and Serology
Med Lab 238:	Clinical Microbiology I
Med Lab 241:	MLT Fundamentals II
Med Lab 243:	Clinical Chemistry II
Med Lab 244:	Hematology II
Med Lab 245:	Histotechnology
Med Lab 246:	Immunohematology
Med Lab 248:	Clinical Microbiology II

Student Evaluation Form

"Canadian Society of Laboratory Technologists Syllabus of Studies for General Certificate"

Med Lab Admissions Package

Med Lab Student Handbook

Med Lab Student Schedule - Fall Semester and Winter Semester

Med Lab Instructor Schedule - Fall Semester and Winter Semester

Canadian Medical Association, Basis of Accreditation for Allied Medical Education Programs

DISCUSSION

Questionnaire responses from all constituencies except two were high. Faculty and current students elicited a 100% response; 86% and 89% returns from the employers and the Clinical Education Co-ordinators respectively were equally pleasing. The two constituencies with disappointing returns were Advisory Committee members (a 50% response from the group responsible for monitoring the program) and former students of the period 1983-86 (their 33% response compared unfavourably with 77% response of 1986-87 students). Nevertheless, all group responses were sufficiently large to provide meaningful data.

QUESTIONNAIRE DATA

The following trends were detected in the questionnaire responses:

Advisory Committee Survey

- The Advisory Committee did not feel that it effectively fulfills its roles and responsibilities in the establishment and continual evaluation of the program objectives and content.
- It did not feel that it effectively fulfills its roles and responsibilities in advising the College on equipment for laboratories, shops and specialized facilities.
- It did not feel that it functions effectively in eliciting individual contributions from its members.
- It did not feel that the program provides adequately for the development of verbal and written communication skills.
- It felt it should meet more frequently.

Education Co-ordinators

- Education Co-ordinators perceived deficiencies in preparation in Clinical Chemistry, Lab. Calculations, and quality control (particularly in the areas of Microbiology and Histology).

Employer Survey

- Employers were generally satisfied with the program but identified the following areas in which it might be improved: quality control, social and verbal skills, instrument repair and technical trouble-shooting, and initiative and professional appearance.
- They complimented the program on the general reliability and sound theoretical knowledge it instilled in its students.

Faculty Survey

- Faculty were generally satisfied with most areas of the program. However, they identified the following areas of concern: lack of oral and written skills, content gaps in the curriculum, and insufficient time and resources to sustain the quality of the program.

Current Student Survey

- Current students were generally satisfied with all aspects of the program with the following exceptions:
 - the quality of the text in Anatomy and Physiology
 - the attitude of instructors in Anatomy and Physiology, Hematology, and MLT Fundamentals
 - the workload and the time allowed to learn the material in Clinical Microbiology
 - the overall program workload (this concern was identified by 11 out of 13 students surveyed).

Former Students (1986-87)

- Former students (1986-87) were generally satisfied with all aspects of the program with the following exceptions:
 - the quality of the text in Anatomy and Physiology
 - the quality of the text, appropriateness of methods of instruction, usefulness of help and attitude of the instructor, availability and currency of equipment, and effectiveness of Clinical Chemistry as workplace preparation. However, the Committee noted a discrepancy between the responses of those students whose clinical placement was at R.I.H. and those who trained at other hospitals. The latter group recorded a higher level of satisfaction than did the former.
 - lack of communications training

Former Students (1983-86)

- Former students (1983-86) were generally very satisfied with the Biology, Medical Terminology, and Physics courses in the old three-year program.
- They expressed dissatisfaction with Clinical Chemistry's effectiveness as workplace preparation. Again, the Committee noted a difference in the responses of R.I.H.-trained students and those trained elsewhere in that the latter indicated satisfaction while the former did not.
- The Careers English Course 157/167 (no longer part of the program) came under considerable criticism for the quality of its texts, the instructor's attitude to students, and the perceived inconsistency and unfairness of assessment methods.

SUMMARY OF QUESTIONNAIRE DATA
(Medical Laboratory Technology Program)

The categories and quantities of responses are tabled below:

Recipient	# Sent	# Completed and # Returned	% Return
Advisory Committee	10	5	50%
Employers	50	43	86%
Faculty	9	9	100%
Education Co-ordinators	9	8	89%
Students: Current	13	13	100%
*Former	86	37	43%
Total	177	115	65%

***Former Students
by year**

1986-87 (2-year program)	21	16	77%
1983-86 (3-year program)	65	21	33%
Total	86	37	43%

as at 03/31/88

ADMISSIONS DATA AND PERFORMANCE STATISTICS

Admissions Requirements:

Admission requirements for the Medical Laboratory Technology Program are currently:

1. A passing grade in the following first-year university level courses (or equivalent):

Biology 101 or 102
Chemistry 100 or 120
English 100
Mathematics - 3 credits at the 100-level (Math 100 and 101 recommended)
Physics 110 or 115

These requirements may be met at Cariboo College by the following courses:

BIOL 111/121
CHEM 110/120 or 111/121
ENGL 110/111/121 (any two)
MATH 114/124 (recommended)
PHYS 110/120 04 115/125

2. Documentation of a tour of a clinical laboratory facility.
3. Interview designed to examine fluency in oral and written English, and motivation and commitment towards a career in Medical Laboratory Technology.

Program Capacity/Demand:

	<u>No. of Applicants (unscreened)</u>	<u>Qualified Applicants</u>	<u>Admitted</u>	<u>Actual Enrolment</u>
1984-85	unknown	unknown	23	23
1985-86	unknown	unknown	22	22
1986-87	36	21	21	21
1987-88	37	20	18	16
1988-89	32	30	16	?

These figures indicate that interest in the program is on the increase; unfortunately, program intake is predicated by the number of clinical placements available and the uncertainty about this number over the past several years has driven down actual program enrolment.

Gender Ratio:

The ratio of females to males in the program averages 4:1 over the past five years; currently there are 3 males and 10 females in an enrolment of 13.

Attrition:

	<u>Attrition %</u>	<u>Actual #</u>
1983-84	10%	2 out of 20
1984-85	4%	1 out of 23
1985-86	14%	3 out of 22
1986-87	14%	3 out of 21
1987-88	20%	3 out of 16

The program's attrition rate is negligible. This may be attributed to the high standard of academic performance required as a prerequisite to the program, coupled with the small class size. C.S.L.T. results indicate that with few exceptions, Cariboo College student pass rates compare favourably with the national averages.

PLACEMENT DATA

Clinical Placement:

Clinical placement of Cariboo College Med Lab graduates is at crisis point as there are 22 spots in the Med Lab program but only 14 funded clinical places currently available (at Royal Inland and Prince George Regional hospitals). R.I.H. has reduced the number of clinical places from 10 to 8 for students starting clinical in June, 1988, but will consider 10 spots for June, 1989. Although the Ministry of Advanced Education and Job Training has provided some relief for 1988/89 by providing bursary money, failure to resolve this problem permanently may jeopardize the program accreditation scheduled for fall, 1988, as the number of clinical places must correspond to the program intake at the College.

Types of Employment:

Program prepares students for work in clinical laboratories (private and public), and more limitedly in academic, industrial and agricultural research; sales is another option.

Placement Mechanisms:

Because of the specific nature of the training and the mandatory clinical year before employment, no placement mechanisms exist at the College. The fact that, for instance, all but one of the 1986 graduating class of 19 are currently employed suggests that placement mechanisms are not necessary.

Current Salaries:

C.E.I.C. figures list current salaries (1988) from \$1,500 in a private laboratory to \$2,279 per month in a hospital laboratory. The trend in Canada towards privatization of health care may have the effect of lowering the laboratory technologist's average salary.

Job Opportunities Projection:

Although technological impact may erode job numbers, this trend will essentially be balanced by the introduction of

more sophisticated procedures. According to Job Futures (1986-87 edition), laboratory technology employs an estimated 36,000 people Canada-wide; this figure is projected to increase to 41,000 by 1992, a change of 5% over 5 years or 1% per annum. This projection correlates with the B.C. situation: the 50 employers surveyed by Program Review indicated that an average of 1 position per organization would likely become available in the next year; part-time prospects were reported as more promising.

Further Education:

Substantial opportunities exist for the Cariboo College Med Lab Program's moving into the area of further education. While the C.S.L.T. facilitates continuing education up to Advanced Registered Technologist (A.R.T.) level, former student responses indicate a demand for local management courses that would count towards this qualification. In addition, the considerable local interest in degree completion could be met by implementation of the College proposal to introduce a full Bachelor's Degree in Health Services Administration.

STRENGTHS OF THE PROGRAM

The Program Evaluation Committee identified the following strengths in the Medical Laboratory Technology Program:

1. Although not unique and indeed to some extent dwarfed by its counterpart at B.C.I.T., the Cariboo College Medical Laboratory Technology Program appears to meet the needs of the Interior of the Province.
2. The program is small, intimate, and student-oriented; these factors are conducive to a positive learning climate.
3. The Medical Laboratory Technology Program admissions package put together by the faculty is well received and should be complimented.
4. Student performance on the C.S.L.T. examinations indicates that they are academically prepared; this may point to the instructional competence of Cariboo College Med Lab faculty, although it should be noted that the clinical year reinforces and augments the training and knowledge required to pass C.S.L.T. exams.
5. Employers complimented the theoretical knowledge that the students gained from the program.
6. Employers noted the maturity and reliability of most students emerging from the program. Several comments on the "better quality student" that the program produces were noted in the employer survey responses.

AREAS WHICH CAN BE IMPROVED
(WITH RECOMMENDATIONS)

This section highlights areas of the Medical Laboratory Technology Program which the data suggest can be improved.

1. Clinical Placement

The disparity between the number of clinical places in the hospitals and the program capacity at Cariboo College jeopardizes the credibility of the program and its chances of re-accreditation in fall, 1988. It also places a great deal of stress on students in the program who are not guaranteed clinical placement, and on the faculty, who are pushed to the utmost every year to find sufficient placements within and even outside the province (in locations such as Alberta and Ontario). The Ministry of Advanced Education and Job Training has extended its financial support for another year of students not being paid by the hospitals during the clinical phase of the program, but such a precarious and temporary measure needs permanent resolution. Therefore,

the Committee recommends that the issue of disparity between clinical places and program capacity and the funding of the clinical phase of the program be resolved with the utmost expediency by the Ministries of Health and of Advanced Education and Job Training. It is essential that this issue be resolved prior to program accreditation by the C.M.A. this fall.

2. Workload

(a) Student Contact Hours

The Task Force on Medical Laboratory Training in British Columbia recommends that the academic portion of the program consist of 1200 instructional hours(+/- 5%). At Cariboo College, 1172 hours of instruction are compressed into an eight month period, with a 39 hour instructional week in both semesters. In addition to creating stress among students and faculty, such a workload is clearly not conducive to optimum learning, and allows little time for study and non-academic activities.

In order to distribute student workload more equitably, the Committee recommends that one course be scheduled and taught intensively in May so as to spread instruction over a nine month period and thus lessen student workload in the fall or winter semesters.

(b) Volume of Instructional Material

Given the demands of the program even with the above modification,

the Committee recommends that all course curricula, especially Microbiology and Anatomy and Physiology, be examined in detail to see what can be pared down or eliminated.

3. Advisory Committee

(a) Given the fact that the Medical Laboratory Program curriculum is set by the C.S.L.T., it is recommended that the Advisory Committee's focus should be liaison with clinical training facilities (and potential ones), and promotion of the program.

(b) The Committee notes that six of the ten Advisory Committee members work at Royal Inland Hospital; it recommends that geographical representation on the Advisory Committee be diversified so as to ensure a broader range of input.

(c) Given indications of sporadic and irregular Advisory Committee meetings prior to 1987, the Committee recommends that the Advisory Committee meet on a regular basis, twice per year.

(d) In view of the apparent overlap and duplication between the Advisory Committee and the Integrated Program Committee (IPC), the Committee recommends that these bodies clarify their functions and roles and consider amalgamation.

4. Faculty

(a) Clinical Currency

In the light of concerns expressed by the Advisory Committee, employers and faculty about the need for clinical currency,

the Committee recommends that, as per C.M.A. accreditation guidelines (PART I, p.11), "didactic instructors should be able to demonstrate evidence of adequate current clinical exposure (records of "return-to-practice" or "exchanges" should be made available)."

(b) Professional Deportment

- (i) There is a perception among faculty and students that mutual disrespect and conflict exist among faculty and that this is deleterious to the program.
- (ii) Student responses indicate dissatisfaction with the attitude of some faculty towards students. Current students complained particularly about the attitude of the instructors in Medical Laboratory Fundamentals, Hematology, and Anatomy and Physiology.
- (iii) Responses from various quarters indicate that Royal Inland Hospital--College relations have been strained by lack of professional deportment on both sides.

Therefore, the Committee recommends that the Director of Science/Health Sciences immediately take appropriate action to resolve these problems.

In response to item (iii), it is further recommended that the two-way information flow between College and Clinical faculty be improved.

5. Curriculum Related

(a) Texts

- (i) Such was the dissatisfaction expressed about the Anatomy and Physiology text, Introduction to Human Disease, by L.V. Crowley, that the Committee recommends that it be dropped.
- (ii) While Bryant's Introduction to Immunochemistry was well received, there was some concern about the appropriateness of the Microbiology and Clinical Chemistry texts.

It is therefore recommended that all instructors ensure that their course texts are necessary and appropriate to course requirements, and that they make students aware of possible future uses for these texts.

(b) Curriculum Modification

In response to concerns expressed by the Clinical Education Co-ordinators, employers and students about lab calculations, quality control and its application to Microbiology and Histology, and written and oral communication skills, it is recommended that the faculty redress deficiencies in these areas.

(c) Writing Skills

It is recommended that, in line with Science/Health Science Divisional goals, Med Lab instructors continue to include short answer questions in their examinations.

6. Instructional Effectiveness

Although the data point to apparent deficiencies in the instructional effectiveness of Clinical Chemistry, responses from R.I.H. trainees give lower evaluations than those from students placed elsewhere. Thus these perceived deficiencies may in fact be attributable to the problems in liaison and co-ordination between College faculty and R.I.H. personnel identified in 4(b)(iii). Accordingly,

the Committee recommends that the program co-ordinator continue to monitor this situation.

7. Entrance Requirements

The Committee recommends that the Med Lab faculty examine the Cariboo College pre-requisites to the program and consider including the following options:

Biology 159/169; Math 110/120 or Math 158.

8. Administration

(a) Because students found attendance regulations in the Medical Laboratory Student Handbook demeaning, the Committee recommends that comments on attendance regulations be deleted from the Handbook, and that instructors instead make it clear in class that attendance is required.

(b) The Committee recommends that the student evaluation form currently used for non-academic assessment be revised with the input of qualified specialists so as to elicit responses to objective statements only.

9. Equipment

In spite of a recently introduced preventative maintenance program, equipment still undergoes deterioration which necessitates investment of funds for repair and upkeep. However, it is false savings to allow maintenance

APPENDIX A

costs over the long term to outstrip replacement costs, particularly when basic equipment such as microscopes, centrifuges and water baths is constantly needed. Therefore,

the Committee recommends that the Science/Health Sciences Division continue to provide basic equipment necessary to meet the needs of the program.

10. Operating Budget

The Med Lab supplies budget was consistently overrun in the period 1984 to 1987. This may be because Med Lab personnel and often Med Lab supplies and equipment are used to service other programs such as Animal Health Technology, Respiratory Therapy, Nursing and U.T. Science.

The Committee recommends that the inter-relatedness of Medical Laboratory Technology with other programs in the Division and the consequent difficulties of tracking supplies and program costs discretely and accurately be recognized.

11. Articulation and Liaison

- (a) The Committee recommends that the Medical Laboratory faculty pursue the possibility of offering, initially in co-operation with the universities, advanced level University Transfer courses leading to a Bachelor's in Health Services Administration or Medical Laboratory Science.
- (b) The Committee recommends that the co-ordinator, Medical Laboratory Technology, identify Cariboo College U.T. courses which might count towards the A.R.T. qualification and contact the C.S.L.T. to verify their eligibility.
- (c) The Committee recommends that in spite of previous rebuffs by B.C.I.T., Cariboo College Med Lab faculty should continue to attempt consultation with B.C.I.T on matters such as student clinical placement and instructional co-operation.

APPENDIX A

COST EFFICIENCY

The cost per student contact hour in Allied Health Sciences at Cariboo College for fiscal year 1985/86 (the most recent year for which figures are available) was \$4 as opposed to the Provincial mean of \$5.53. This seems to indicate that the Respiratory Therapy/Medical Laboratory Technology operation at Cariboo College is (or was) 37.5% more efficient than the Provincial mean. Unfortunately, no separate set of figures can be extracted for Med Lab alone to determine its cost efficiency in relation to similar programs in the Province.

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