Organization and management of an accredited specialist in blood bank (SBB) technology program

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BACKGROUND: Specialists in blood bank (SBBs) technology play important roles in blood banks, transfusion services, regulatory agencies, educational institutions, and other facilities where expertise in blood banking, transfusion medicine, cellular therapy, and tissue transplantation is required.

STUDY DESIGN: Review of pathways that qualify applicants for a national examination administered by the American Society of Clinical Pathology (ASCP) to become a certified specialist and outcomes of accredited programs. Description of a face-to-face, accredited program including review of management topics included in curriculum.

RESULTS: The first examination was administered in 1954. As of December 2009, the total number of certified SBBs was 5124. There are currently 16 accredited SBB programs in the United States. The programs vary in mode of delivery, length of program, number of students accepted, and organization of program officials and faculty, but all must follow specific standards and guidelines in order to be accredited.

CONCLUSION: Students who successfully complete SBB programs have a higher passing rate than those who attempt the certification examination and have not participated in a program. Students can choose among a variety of programs that differ widely in the way they are managed. The role of management in an SBB program ranges from attracting and retaining individuals and maintaining an accredited program to finally graduating individuals who not only pass the certification examination but who also confidently contribute to the field.

INTRODUCTION

There are many pathways one can follow to become a specialist in blood bank (SBB) technology in the United States. One direct path is to sit for the American Society of Clinical Pathology (ASCP) Board of Certification (BOC) Medical Laboratory Scientist (MLS) examination after receiving a bachelor of science in medical laboratory science from a regionally accredited college or university. If successful, the certification initials MLS(ASCP) can be added as a suffix, i.e., Jane Smith, MLS(ASCP). The title Medical Technologist or Clinical Laboratory Scientist has recently been replaced with Medical Laboratory Scientist to better define laboratory professionals.[1] There is also a written examination offered by the ASCP for individuals employed in blood banking who have baccalaureate degrees but who are not certified medical laboratory scientists. This is the Technologist in Blood Banking examination; the successful candidate is eligible to use the suffix BB(ASCP).[2] Jane then starts working in a hospital blood bank and after a couple of years realizes that there is more to learn about

ABBREVIATIONS: ASCP = American Society of Clinical Pathology; BOC = Board of Certification; CAAHEP = Commission on Accreditation of Allied Health Education Programs; MLS = Medical Laboratory Scientist; SBB(s) = specialist(s) in blood bank.

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TABLE 1. Different routes offered by the Board of Certification to be eligible for the SBB examination

Route	Initial qualification	Work experience		SBB examination taken
		Environment	Minimal time	
1	Baccalaureate degree from a regionally accredited college/university including biological science, chemistry, and mathematics courses and successful completion of a CAAHEP-accredited Specialist in Blood Bank Technology program	Determined by program	Determined by program	Within 5 years of completion of a CAAHEP-accredited program
2	MT/MLS(ASCP) or BB(ASCP) certification and a baccalaureate degree from a regionally accredited college/university	Full-time acceptable clinical laboratory experience in blood banking in the United States, Canada, or a CAP/The Joint Commission (TJC) accredited laboratory	3 years	Within 10 years since start of work experience
3	Master's or doctorate degree in an appropriately related field from a regionally accredited college/university	Full-time acceptable clinical laboratory experience in blood banking in the United States, Canada, or a CAP/TJC-accredited laboratory	3 years	Within 10 years since start of work experience
4	Doctorate degree in an appropriately related field from a regionally accredited college/university	Postdoctoral fellowship in blood banking in the United States or Canada	2 years	Within 10 years since start of work experience

CAAHEP = Commission on Accreditation of Allied Health Education Programs.

blood banking. She decides to apply to one or more of the 16 accredited Specialist in Blood Bank Technology programs. Jane is accepted and graduates from a Commission on Accreditation of Allied Health Education Programs (CAAHEP)-accredited program. She is now eligible to sit for the ASCP BOC Specialist in Blood Banking examination. If successful, then SBB can be added as a suffix, i.e., Jane Smith, MLS(ASCP)SBB.

Not every SBB aspirant follows such a direct path, and for that reason, there are other routes that one may take with the same final professional achievement (Table 1).[2] Route 1 requires completion of a CAAHEP-accredited SBB program, while routes 2, 3, and 4 do not. They do, however, require a professional degree in a related field plus current work experience in a blood bank. If an interested person holds a master's degree in an appropriately related field from a regionally accredited college or university and 3 years of full-time acceptable clinical laboratory experience in blood banking in the United States, Canada, or a CAP/The Joint Commission (TJC) accredited laboratory within the last 10 years, then he or she qualifies for the examination because the requirements of route 3 were satisfied. When one obtains an SBB by a route other than attending an accredited program it is referred to as "grandfathering" the examination.

A person who achieves SBB certification must have recognized proficiency in all aspects of blood banking, transfusion medicine, hematopoietic, cellular, and gene therapies, and tissue transplantation.[3] Further expertise comes with experience and continued learning. Individuals may choose to become SBBs for professional growth, better job placement, and enhanced job satisfaction. A wide variety of positions are held by SBBs, including but not limited to quality assurance officers, technical specialists, supervisors, educators, and several AABB presidents. Considering the relatively low number of individuals with an SBB qualification compared with the large market size of available positions, the job opportunities are excellent.

DESIGN OF PROGRAMS

As of December 2009, there were 16 CAAHEP-accredited SBB programs in the United States (Table 2).[4,5] All accredited programs must comply with the Standards and Guidelines for the Accreditation of Educational Programs in Blood Bank Technology/Transfusion Medicine.[2] In addition to on-site assessments, each program must submit an annual outcome-based statistical report.

The design of each program is unique. With the popularity and convenience of distance education, almost half of the programs offer an online option. There are also full-time and part-time programs. Some programs offer a certificate of completion while others offer a master's degree. One can look for a program that allows students to work at the affiliated hospital, earning money and gaining experience while attending the program. If location is important, then one can find programs on the west and east coasts as well as in other areas of the United States (Fig. 1).

The design of each program may be different yet meet the minimally required content. Each program is composed of program personnel that include medical director or medical advisor, program director, education coordinator, and faculty and/or instructional staff.[3] The

TABLE 2. Details of CAAHEP-accredited Specialist in Blood Bank Technology programs in the United States

Location: State, City	Institution	Contact information		Student capacity	Delivery method		Enrollment	
		Name	Phone		Face-to-face	Online	Full time	Part time
CA, Pomona	American Red Cross Services	Michael Coover	909-859-7496	6	✓		✓	
DC, Washington	Walter Reed Army Medical Center	William Turcan	202-782-6210	8	✓		✓	
FL, St. Petersburg	Transfusion Medicine Academic Center FL Blood Services	Marjorie Doty	727-568-5433	5		✓	✓	
IL, Chicago	Rush University	Veronica Lewis	312-942-2402	10		✓	✓	✓
IN, Indianapolis	Indiana Blood Center	Jayanna Slayten	317-916-5186	4		✓	✓	
LA, New Orleans	Medical Center of Louisiana at New Orleans	Karen Kirkley	504-903-3954	4	✓		✓	✓
MD, Baltimore	Johns Hopkins Hospital	Lorraine Blagg	410-502-9584	6	✓		✓	
MD, Bethesda	NIH Clinical Center Department of Transfusion Medicine	Karen Byrne	301-496-8335	3	✓		✓	
OH, Cincinnati	University of Cincinnati Medical Center	Susan Wilkinson	513-558-1271	2	✓		✓	
OH, Columbus	American Red Cross Blood Services	Joanne Kosanke	614-253-2740	4	✓			✓
OH, Dayton	Community Blood Center	Nancy Lang	937-461-3293	4		✓	✓	
TX, Dallas	University of Texas Southwestern Medical Center	Laurie Sutor	214-648-1780	8		✓		✓
TX, Galveston	University of Texas Medical Branch	Janet Vincent	409-772-3055	17		✓	✓	
TX, Houston	Gulf Coast School of Blood Bank Technology	Clare Wong	713-791-6201	6		✓	✓	
TX, San Antonio	University of Texas Health Science Center at San Antonio	Linda Myers	210-731-5526	2	✓		✓	✓
WI, Milwaukee	Blood Center of Wisconsin	Lynne LeMense	414-937-6403	4	✓		✓	

responsibilities and qualifications of the medical director, program director, and education coordinator are such that they may be held by the same person if a program is set up to ensure that it is in accordance with the Standards; that type of structure would place a heavy burden on one person.

OUTLINE OF A FACE-TO-FACE PROGRAM

The design of the SBB program of the National Institutes of Health (NIH) is reviewed as an example of an on-site program. Organization and management of this program have evolved over more than 40 years. The on-the-job training format includes formal lectures in addition to those offered routinely to all staff. One day per week is set aside specifically for didactics while the other 4 days are dedicated to working in the full-service blood bank and attending clinical rotations. This structure allows students to attend the program and earn living expenses. It is a face-to-face program with a dedicated education coordinator and many supporting faculty. The NIH program has three different individuals acting as medical director, program director, and education coordinator and greater than 25 instructional staff. The program at the NIH, Department of Transfusion Medicine was instituted in 1966 and has been restructured several times since.

The current structure requires SBB students to keep four pots stirred at all times (Fig. 2). The CAAHEP Standards and Guidelines and the BOC examination content guideline provide the curriculum to be followed.[3,6] It is necessary to address the three learning domains—cognitive, affective, and psychomotor—when identifying program goals and outcomes. Students receive greater than 200 hours of face-to-face instruction and are given approximately 20 tests, including three comprehensive examinations. Also, in the pot labeled didactics, students participate in monthly journal clubs where they are expected to read a current and relevant journal article and prepare a Powerpoint presentation for an audience of at least six people including senior medical staff. Homework assignments are often given to encourage students to actively gather and assimilate information. The clinical rotations allow students to gain hands-on practical experience. Each rotation has objectives and post-rotation questions are completed to ensure students obtain the necessary skills and knowledge expected. Six weeks are dedicated to hands-on serology and molecular techniques in blood groups.

MANAGEMENT SKILLS TAUGHT IN THE PROGRAM

As SBB training prepares students to become leaders with management and organizational skills, one objective is to

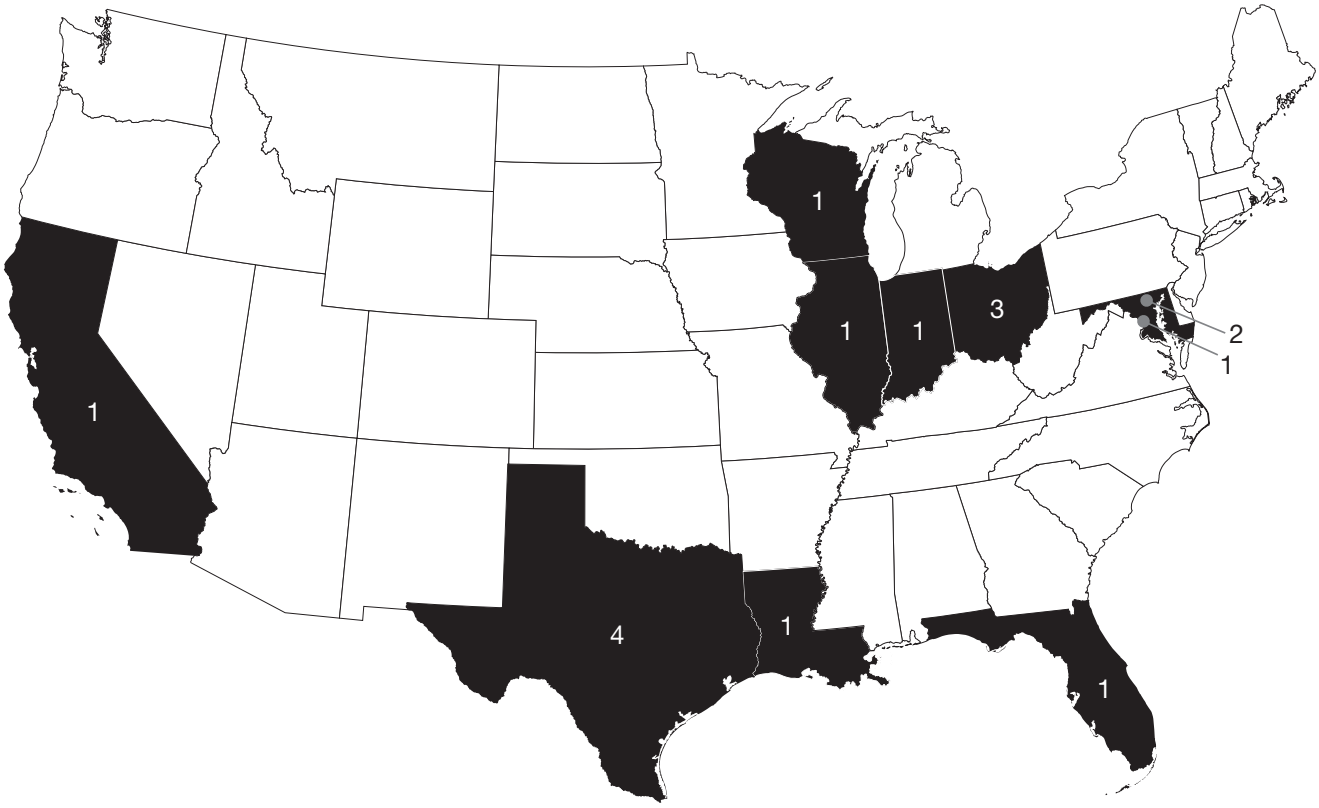

Fig. 1. Location of Commission on Accreditation of Allied Health Education Programs–accredited Specialist in Blood Bank Technology programs in the United States. The number of programs per state is indicated (for details see Table 2).

complete a student project. The project may be scientific, educational, or management oriented. Students are the project owners but are mentored by a senior staff faculty member. Students design the project, order supplies, acquire necessary skills, manage data, analyze data, and present findings both written and verbally. Time management is a skill mastered by all graduates!

NIH students receive lectures addressing management topics such as budgeting, managing a diverse workforce, problem solving, and decision making and performance evaluation. They also shadow a transfusion service coordinator and laboratory supervisor during a 1-week clinical management rotation. This rotation provides them the opportunity to manage blood inventory, organize laboratory staffing coverage, write or edit a standard operating procedure, and participate in the weekly management meeting. They may perform record reviews, investigate and document occurrence reports, and write validation plans or execute an equipment or process validation. Additional management exercises might include designing a cord blood bank laboratory given specific parameters or outlining a plan to prepare the laboratory for an upcoming inspection given a set of standards and assessment tools. Students are also guests at a Transfusion Committee meeting.

PROGRAM MANAGEMENT

Since its inception in 1966, the NIH SBB program has remained active and dynamic. Program modifications were made based on constructive feedback from students and mentors. Two significant changes made to the program based on participant feedback include providing dedicated time for student projects and devoting one full work day for didactics rather than 2 hours per day, Tuesday through Friday. Students are constantly evaluated by tests, quizzes, homework assignments, journal club presentations, or work performance evaluations. Several times throughout the year students are required to evaluate lectures, examinations, and project progress. This in turn leads to further fine-tuning and improvement in program design. The NIH hires its students as temporary part-time employees where they work in the transfusion service laboratory as medical technologists. This structure has worked out well for the students and laboratory management of the program.

OUTCOMES ASSESSMENT

The annual report required of each accredited SBB program contains statistics of five outcome assessments.

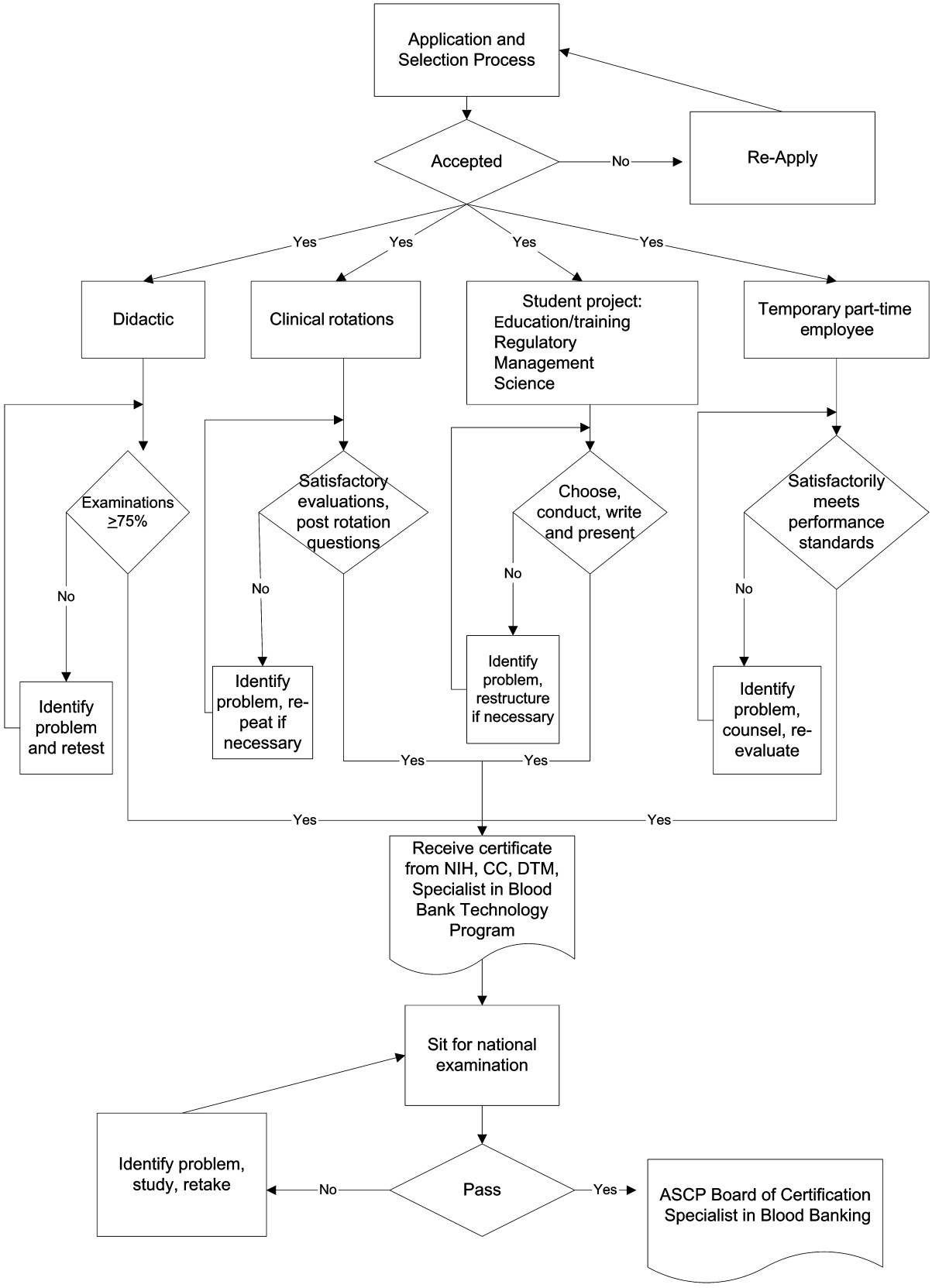

Fig. 2. Flowchart of a representative Specialist in Blood Bank (SBB) Technology program. The on-site SBB program at the National Institutes of Health is composed of four components which are performed concurrently during the 1-year certificate program.

Outcomes include 1) graduation rates, 2) SBB certification examination success, 3) career advancement, 4) employer satisfaction, and 5) graduate satisfaction. Other measures of success may also be included, such as publications and awards received while attending a program or directly as a result of being in a program. A summary of the 2009 annual reports of all SBB programs was provided to each of the accredited programs. As a whole, all programs are doing very well. The student attrition rate was 14.8% for all programs, both face-to-face and online, yet when presented separately, face-to-face programs had much lower attrition rates than online programs, 7.7% compared with 18.8%.

Examinees from CAAHEP-accredited programs (Table 1, Route 1) taking the examination for the first time had a pass rate of 86% for January to December 2009.[7] This pass rate is higher than the non-CAAHEP program test takers (Table 1, Routes 2-4), which was only 53%.

Another outcome assessment is job placement/career advancement and greater than 98% of students are employed in a blood bank-related field or are pursing higher education. The results of both employer and graduate surveys indicate that employers are satisfied with the skill set and knowledge that the students bring with them to the job after graduation and the students are satisfied with the education and skills they acquired while in a program.

OPPORTUNITIES FOR CHANGE AND MANAGEMENT IMPROVEMENT

To maintain a successful SBB program, one must be constantly aware of changing regulations, technologies, and economic situations. The curriculum must be kept current and reflect new topics such as tissue management, molecular techniques, quality and regulatory issues, or the latest management techniques. A program needs to remain in good standing with accrediting bodies. Managers of SBB programs need also to be aware of other issues that may affect SBB programs. These are not technical concerns but are very important nonetheless. Students may span different generations and may have different learning and behavior styles. It is not the program managers' responsibility to entertain students, yet one must present information so that students engage in the learning process and become active learners rather than passive listeners.

Because of difficult economic times the desire to attend an SBB program may be identified, but the financial hardship may be too burdensome for a potential candidate to give up a permanent position or to physically move to attend school. Programs that offer employment or a stipend may be more successful at attracting students than those which do not offer financial incentives. On the other hand, programs offering online classes may attract students needing to retain their full-time job or to remain in their current geographical location or both. It is important to find the right fit for both the student and the school. If the goal of all SBB programs is to produce graduates who not only carry out all operations of the blood bank, from routine testing to the most advanced procedures, but who will also become leaders in our profession, then the time spent in an SBB program needs to be conducive to learning and self-improvement.

CONFLICT OF INTEREST

The authors are managers of an SBB program. They do not declare any conflict of interest.

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