



Designing and Implementing a 5-Year Transfusion Medicine Diploma Program in China



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ABSTRACT

The need for physicians and technical consultants specialized in transfusion medicine is urgent in China, as there are 20 000 hospitals and 500 blood centers in need of staff with this expertise. The progress made in transfusion medicine as a specialty has been relatively slow in China. Current Chinese medical education and service systems have not developed transfusion medicine as a stand-alone medical specialty. Most physicians receive only minimal training in transfusion medicine in medical school. This training is usually integrated into surgical training and addresses the most common technologies. In 2008, a 5-year bachelor's diploma program in transfusion medicine was established as an undergraduate specialty in Southern Medical University, Guangzhou, China. This article intends to summarize the 8 years of experience educating undergraduates in the specialty of transfusion medicine.

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The development of transfusion medicine (TM) has spanned more than 100 years of history stemming from Landsteiner's discovery of the ABO blood group system to the current advancement of cellular

therapy and tissue engineering [1,2]. Over the past 25 years, rapid progress has been made in TM especially in maintaining an adequate blood supply and promoting appropriate use of blood products. Now, TM has evolved into an independent medical specialty with diverse and multifaceted disciplines. In contrast to developed countries, progress in TM in China has been slow [3] even though TM started relatively early in the 20th century. Chinese economic reform in the late 1990s,

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the so-called opening up, led to an economic boom resulting in an increased demand for blood [3–5], which drove the rapid development of TM as a specialty in China [2,6–9]. However, major gaps in TM education still exist when compared with developed countries [3,10–15].

Proper education and training in TM are important for the advancement of the specialty. In developed countries, the typical training of a TM specialist includes medical school, residency, and fellowship [12–14]. However, in the current Chinese medical system, TM has not been developed into a standalone medical specialty. Most physicians receive only minimal training in TM in medical school. This training is usually integrated into surgical training and addresses only the most common technologies such as basic RBC blood typing. Practicing physicians, who hold a bachelor's degree in clinical medicine and a practicing physician license, are only a small portion of staff in the blood transfusion departments. The need for physicians and technical consultants specialized in TM is urgent in China because there are more than 20 000 hospitals and 500 blood centers in China in need of staff with this expertise.

In 2008, a 5-year diploma program in TM was established as an undergraduate specialty in Southern Medical University (SMU), Guangzhou, China. Generally, undergraduate medicine degree students in China receive 5-year education in basic and clinical medicine. The TM diploma program students receive TM education as a specialty while completing their general medicine training. This article intends to summarize 8 years of experience educating undergraduates in the specialty of TM. This article will provide a roadmap for TM training programs in China and elsewhere in the developing world.

Background of TM Education in China

For the past several years, increased attention has been given to the field of TM. In the United States, the manner in which TM is incorporated into undergraduate medical education began in 1983 with the Transfusion Medicine Academic Awards program [14]. For most physicians in China, TM education was given primarily during medical school training, providing a basic understanding of TM and the appropriate use of blood products. For a subset of physicians, additional TM training is acquired through postgraduate training such as residency and/or fellowship. There are more than 12 million blood donations each year in China [3,4], and blood transfusion is a common procedure performed in hospitals [16,17]. In spite of the clinical and financial importance of appropriate blood transfusion, many physicians who prescribe and consent for transfusion are unaware of appropriate transfusion practices and have limited knowledge about blood products. Several surveys were conducted regarding the knowledge level and practice patterns of TM education in the past decade in China [6,16–21]. During the period of 2005–2009, the data among 16 562 staff from 253 blood stations across the country and 174 staff from hospital blood transfusion departments of 3 provinces showed that about 80% of staff who worked in the hospital transfusion service graduated from a technology school (2 years of training post high school) and 20% had a bachelor's degree, whereas less than 2% possessed either a master's or doctorate degree [18–21]; very few transfusion staff had formal training in TM. With the lack of professional and systematic transfusion education and training, a number of practicing TM physicians are reliant entirely on their individual experience. The majority of staff do not have the competence to address case-based problem solving and improvement of medical services or to create new clinical and/or laboratory services. There are a limited number of physicians formally trained in TM who are in charge of donor testing, pretransfusion testing, HLA typing, and others in the blood banking system. The main duties of a hospital transfusion service include inventory management, pretransfusion testing, and distribution of blood or blood components. With the exception of certain tertiary hospitals, there are no physicians to offer transfusion-related consultation, clinical education, and transfusion safety oversight. This is because there are an

inadequate number of trained physicians with formal training in TM [9,16,17].

To address this issue, 4 medical schools in China—Jiamusi, Dalian, Chengdu, and Bengbu—attempted to establish a TM program, issuing a degree of science in laboratory medicine. Currently, only 2 of the training programs remain active. The diploma of laboratory medicine being classified as a science degree and not a medical degree led to discontinuation of TM training program. The designation of laboratory medicine as a science degree prevents graduates of such programs from obtaining employment in hospitals and limits the number of positions available to blood centers [9,22].

The education program in TM developed at Southern Medical University, a national university of Medical Science in Guangzhou China, is designed as a 5-year clinical medicine program with specialty training in TM. The establishment of a specialty in medical school is to meet the massive needs of special medical service and needs official approval and support from provincial and national high education administrations. The same as other specialties in clinical medicine such as pediatrics, psychiatry, and clinical pathology, TM is considered as less attractive to medical students in China; therefore, the TM program is developed as a specialty. Since 2008, the TM program has formally enrolled approximately 40 undergraduate students each year. The students have 4-year courses taught in the university and a 1-year clinical practice rotation in a hospital and blood center. After 5 years of formal training, students are awarded with a bachelor of clinical medicine degree. With this degree, graduates are qualified to work as a junior physician in department of blood transfusion in a hospital and 1 year later can apply for a license of practicing physician through the national practicing physician licensing examination.

Objectives and Goals of the TM Diploma Program

At the completion of 5 years of undergraduate education in TM embedded into clinical medicine, students have acquired theories and skills in basic medicine, clinical medicine, laboratory medicine, and TM. The specialized knowledge and skill in TM are essential for students to become practicing physicians in TM, who are thus qualified to provide guidance and consultation for patient's transfusion needs, donor care, testing, and scientific research.

Courses, Teaching Modes, and Methods for TM

The education program in TM has been modified on 3 occasions during the 8 years of its existence. The TM program includes the same education format as other specialties such as oncology and hematology in clinical medicine. Its current form is as a “2 + 2 + 1” program. The 5-year training includes 2 years of basic medicine, 2 years of clinical and TM training, and 1 year of practical training in a hospital and a blood center. The curriculum, examination, and degree are designed in an integrated and cohesive manner to make sure that the students receive a comprehensive education in TM preparing them for clinical practice and TM service.

Curriculum

Great efforts have been made to integrate TM courses into clinical medicine training as an independent subject [2,8]. Clinical medicine in the Chinese university system is a 5-year undergraduate major, which includes (1) general courses such as philosophy and politics, mathematics, statistics, and chemistry; (2) biology and basic medicine; (3) clinical medicine; (4) public health; (5) practical skills and abilities; and (6) practical learning (clinical practice rotation in hospital). TM and other specialties such as pediatrics and hematology are all under the clinical medicine. They propose the same education program with 6 training modules in university, but they have fewer additional professional courses or more teaching hours according to different specialties.

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