



Original contribution

Initial results of a structured rotation in hematology and transfusion medicine for anesthesiology residents[☆]

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Abstract

Study Objective: To develop and evaluate a new curriculum in transfusion medicine for anesthesiology residents.

Study Design: Quasi-experimental study.

Setting: Single center, pilot curriculum in the anesthesiology residency program at a university-affiliated medical center.

Participants: Group TM consisted of residents who participated in the one month-long transfusion medicine rotation in postgraduate year 2 (PGY2; n = 9). The comparison group (non-TM) consisted of residents who had no exposure to the transfusion medicine rotation (n = 21).

Measurements: We compared results of the 2009 American Board of Anesthesiology In-Training Exam (ABA-ITE) 2009 by residents of our program with the national performance of residents in the first clinical anesthesia year (AMG CA1 = PGY-2) and second clinical anesthesia year (AMG CA2 = PGY-3) on transfusion medicine/hematology knowledge. Performance on a pre-test and post-test of those who took part in the transfusion medicine curriculum, and overall performance on the ABA-ITE, of departmental residents who had and had not participated in the Transfusion Medicine curriculum within the target knowledge area of hematology/transfusion medicine and compared against national peer performance data, was assessed. An anonymous electronic survey (5-Point Likert scale) was used to assess the perceived educational value of the curriculum.

Main Results: Transfusion medicine-related knowledge of anesthesia residents markedly improved from the pre- to post-rotation examination and on the ABA-ITE. In the ABA-ITE 2009, the TM group

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performed better than their national peers (AMG CA1 and CA2) in the hematology content area. The post-rotation anonymous resident survey indicated high resident satisfaction.

Conclusions: A structured transfusion medicine curriculum improved anesthesiology resident knowledge in transfusion medicine and was associated with high learner satisfaction.

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1. Introduction

According to a national survey, 30 million red blood cell (RBC) products and non-RBC components were transfused in 2006, with more than 65% given to surgical or trauma patients [1]. Knowledge of transfusion medicine and proper use of blood products are essential components of anesthesia-related patient care. These expectations are expressed in the content outline of the American Board of Anesthesiology (ABA) for certification [2]. Although some surgical specialties (ie, trauma) may have an integrated structured curriculum in transfusion medicine, most medical students and anesthesia residents do not receive formal or structured training in this subject [3-6]. Indeed, it is expected that the required knowledge is acquired by clinical experience rather than by a focused educational experience.

In an analysis of the national results of the ABA In-Training Exam (ABA-ITE) from 2004 to 2007, we identified considerable knowledge deficits in hematology and transfusion medicine at all training levels of anesthesiology residents, with little improvement during residency training. At early training stages (PGY-2), anesthesia residents correctly answered 40% to 60% of hematology-related questions. Advancement in their anesthesia level of training did not lead to sufficient improvements in this particular knowledge area. Based on documented knowledge deficits and clinical needs, both faculty and anesthesia residents at our institution agreed that more training dedicated to transfusion medicine was needed.

Therefore, we developed a one-month curriculum in hematology/transfusion medicine for anesthesia residents in PGY-2 as a part of the Clinical Base Year. In cooperation with the Department of Pathology, residents spend one month focusing exclusively on transfusion medicine knowledge and its application to anesthesia-related patient care.

Our institution is the first United States residency program in anesthesiology to offer such a unique rotation as a part of the required curriculum. The hypothesis for rotation development was that structured training of anesthesia residents in transfusion medicine would improve the medical knowledge of transfusion medicine.

2. Materials and methods

2.1. Development of the rotation

The institution's graduate medical education office approved the transfusion medicine rotation as part of the

curriculum for anesthesiology residents in the Clinical Base Year. We chose the Clinical Base Year for this rotation because the overall rotation goal is to equip the resident with the medical knowledge to address patient needs based on preexisting conditions and to prepare the resident's knowledge base for application during anesthesiology residency training [7]. At our institution, the Clinical Base Year is integrated into the first clinical anesthesia year over a 24-month time period (PGY-1 and PGY-2).

Starting in the academic year 2008-09, anesthesia residents in the Clinical Base Year spent one month in the Department of Pathology at the University of Kentucky. Goals, objectives, and curriculum implementation of the rotation are outlined in Table 1.

The rotation is divided into several components to address Accreditation Council for Graduate Medical Education competencies and rotation goals and objectives (Table 1). A major structural component of the rotation is to provide a multimodal approach to learning, including didactics, procedures, small group discussions, and opportunities for residents to teach. Thus, we emphasized that residents spend time with patients in the Hematology Clinic, serve as perioperative transfusion medicine consultants, and gain laboratory exposure in the Department of Pathology. The multidisciplinary approach of the curriculum is expected to help learners understand systems-based practice issues in transfusion medicine and to strengthen development of interpersonal and communication skills.

During the rotation, anesthesiology residents are exposed to different points of view on the use of blood products. In addition to using blood components intraoperatively, the residents learn about short-term and long-term implications of blood product use for the individual patient and also for the health care system. For the individual patient, there are direct complications related to blood products and most anesthesia residents are familiar with them. However, the secondary implications of blood products, such as delayed transfusion reactions and blood product-induced immune-modulation, are typically observed in the later postoperative period. The anesthesiology residents study transfusion-related complications from nonanesthesiologists and may develop better judgment regarding the use of blood products [8].

Since the use of blood products has significant implications for health care economics, discussions with non-anesthesiologists about indications for blood component therapy versus blood saving techniques should broaden the knowledge base of the anesthesia residents and lead to better preoperative planning and better blood component therapy,

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