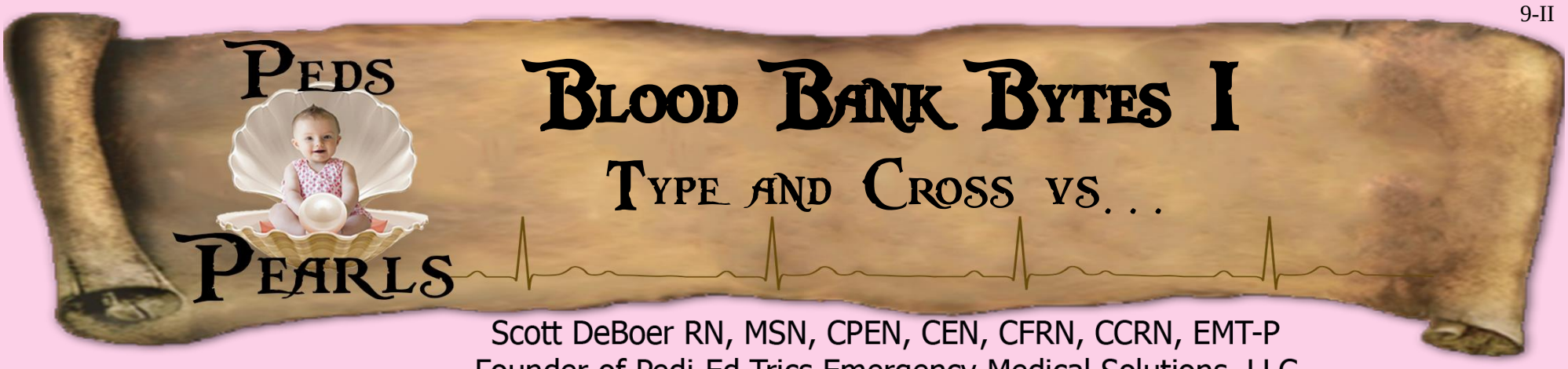


Scott DeBoer RN, MSN, CPEN, CEN, CFRN, CCRN, EMT-P
Founder of Pedi-Ed-Trics Emergency Medical Solutions, LLC

Thanks to J. Robert Gbur, MT (ASCP) for his insights with this Peds Pearl.

TRANSFUSING BLOOD, whether to a child or an adult, is like performing a liquid organ transplant! Modern day transfusion medicine owes its existence to crises experienced during 20th century wars and is credited with saving the lives of many people who experienced serious battlefield injuries. Today, "type and cross (T&C) for two units" is a phrase commonly heard in Emergency Departments as they encounter major trauma situations. On the other hand, an order to "type and screen" is often found in situations with less urgency or simply as a preparation for an anticipated surgery. Let's take a look at the difference between these two types of orders.

TYPE AND CROSS

A **type and cross match** order is actually a two-step order. The first step consists of checking the patient's blood type and antibody screen. The second step involves locating and setting up donor units to infuse into the patient. Identifying appropriate donor units involves mixing the donor red blood cells (RBCs) with the patient's plasma to see if they are compatible. If they are compatible when mixed, the RBCs and plasma stay free-floating in a solution. If they are incompatible, the cells get clumpy and stick together. As you can imagine, on a microscopic level, such clumping becomes problematic in capillaries and other body systems.

TYPE AND SCREEN

A **type and screen** order involves determining the patient's blood type and confirming the antibody status. The difference is that units of blood are <u>not</u> set up during a type and screen, but they can be prepared relatively quickly if a transfusion becomes necessary.

It really is better to give than receive. That's pretty much a universal truth. With blood transfusions, there are a couple of other universals, **universal donors and universal recipients.** To remember what these two types are, think about the situation when a universal DONOR is needed. It's usually a pretty bad situation, one in which you might say, "Oh No." "Oh No" means "O negative." If you need blood in a hurry for that "Oh No" moment, you need O negative blood. In a STAT transfusion situation, which is a *very negative* situation, *O negative* blood type is the universal donor. On the other hand, if you have AB positive patients, you can **a**lways **b**e **positive** that they can receive O, A, B positive or negative blood. That's because you have a universal RECIPIENT, one who can receive any type of blood.



ANTIGENS AND ANTIBODIES

The surface of a red blood cell can be looked upon as consisting of grasses, bushes, and trees. These comprise the antigen makeup of an individual. Antigens are the proteins that make up the cell surface. The <u>majority of the population</u> contains similar grasses, bushes, and trees, just like a neighborhood that can have houses with similar landscapes. But, some yards lack the cookie cutter mold of the majority (think of the bright purple house in your neighborhood). Similarly, when individuals *lack* typical antigens on their RBCs surfaces, problems can arise if exposed to RBCs that have the typical patterns of the majority of people.

When individuals are given blood with antigens they DON'T have, they will generally develop antibodies within 72 hours. Antibodies are made in response to an exposure of antigens that are foreign to that individual. That is why additional cross match workups are needed **every 72 hours**. That's an important consideration to remember because a patient who was "type & crossed" in the ED on day one will have to be "type and crossed" again three days later if blood is then required.

Because it is the exposure to a foreign antigen that causes antibodies to be made, an individual who lacks a certain antigen can be given blood with the antigen <u>once</u> before antibodies develop; this includes the Rh factor. This means that an Rh negative person can be given Rh positive blood <u>once</u> before antibodies become an issue. Of course, there are dozens of other antigens that also cause the formation of specific antibodies. Once a person who lacks specific antigens develops specific antibodies to those antigens, later cross matches become more and more complex, as it now becomes necessary to find blood that will not cause an antibody response.

CONTRARY TO POPULAR BELIEF, in patients that have antibodies from previous exposure to blood products, the universal donor (O negative) does NOT mean trouble-free transfusions. Also, universal donor blood still contains grasses, bushes, and trees that the recipient may lack, and if already exposed by previous transfusions, the individual will already have existing antibodies, and thus cause a transfusion reaction. Giving blood is like giving a liquid organ transplant… the better the match, the better the outcome!

Pedi-Ed-Trics™
Emergency Medical Solutions, LLC



Peds Pearls™ is a registered trademark of Pedi-Ed-Trics Emergency Medical Solutions, LLC and is intended to provide accurate pediatric emergency Tips, Tricks, and Treasures for emergency medical professionals when caring for critically ill or injured children. However, always follow your medical director's specific protocols.

Contact us to have Scott DeBoer or one of our other pediatric experts present at your next conference.

Info@PediEd.com ~ 1-888-280-PEDS (7337) ~ PediEd.com

