

## **Episode 48: Bloodlines: The Connection Between Blood Donation and Patient Health**

**Josh Casey:** Hi, I'm Josh Casey. Welcome to *QuidelOrtho Science Bytes*, your trusted source for diagnostic insights and innovations. June 14 marks an important date on the calendar, that is World Blood Donor Day. In the U.S. alone, someone needs red blood cells, platelets or plasma every 2 seconds for everything from routine surgeries to chronic illness and traumatic injuries. And while it's estimated that as much as 90 percent of the population will need blood or blood products over the course of their lifetime, only 3 percent of age-eligible people donate blood yearly, according to the American Red Cross. In today's podcast, we'll explore the key factors that keep the blood supply system flowing, including the critical need for donation, how blood and blood products are used, as well as the multitude of checks and balances employed by hospitals and blood banks to ensure patient safety before, during and after blood transfusion. Joining us now is Michelle Mullens, Global Portfolio Marketing Manager for Transfusion Medicine at QuidelOrtho. Before starting her career on the vendor side, Michelle was a Senior Medical Technologist at Baptist Health, serving in leadership roles for transfusion medicine and immunohematology for nearly 30 years. At QuidelOrtho, Michelle has served as a technical specialist, business development consultant and clinical science liaison before taking on her current role in the global business unit. With significant experience in the blood bank and deep passion for patient care, Michelle brings a unique perspective to the conversation today. We are fortunate to have her with us to share her expertise. Welcome, Michelle. Thank you for coming on the podcast.

**Michelle Mullens:** Thanks, it's great to be here.

**Josh Casey:** Great, let's kick things off with a bit of background. You are the global portfolio manager for transfusion medicine. What exactly are transfusion medicine assays, and how are they used in healthcare today?

**Michelle Mullens:** Well, you know, the general tests that are run in a hospital or in blood bank settings, and these are used to ensure safe blood products, they're used to help prevent transfusion reactions and limit infections via blood transfusion, and also reduce risks and limit complications. We also do what's called an ABO and RH type, and this uses antibody reagents to test the cells and something called reverse cells to confirm what we've just interpreted from the front type. Importantly, these reverse cells come from donated blood. Antibody screening is how we try to predict, in part, the compatibility of donor blood. Each bottle of screening cells or panel cells is derived from a unique donor of red cells prior to being manufactured as a reagent. Cross-matching serologically involves mixing the patient plasma which would have antibody with our chosen donor cells. This should have no reactivity, so we feel confident the transfusion would proceed safely. And then infectious disease screening involves a variety of methodologies such as nucleic acid testing, antibody testing and antigen testing to minimize any chance of bloodborne pathogens such as HIV and various hepatitis viruses. These can also have specific regional requirements such as Babesiosis or West Nile virus in endemic areas.

**Josh Casey:** Thanks for those details. For the average person, when we think about blood transfusions, we tend to think of the traumatic scenarios like a car accident or a situation where there is a significant loss of blood. What are some of the other common ways that blood and blood products are used?

**Michelle Mullens:** Right, so trauma is certainly a critical need, right? We can't reschedule trauma. But there's several common uses for all kinds of patients, including cancer treatment, right? People are living longer now with various types of cancers, but oftentimes, chemotherapy and different treatment regimens damage the bone marrow. So, this requires red blood cell transfusions and most often platelets because something called thrombocytopenia happens where you have a very diminished platelet count, and these patients require blood and blood product transfusions quite often. Chronic disease, including sickle cell disease, which requires patients to undergo regular transfusions to increase the normal red blood cell count. A red blood cell that is sickled will only last 10 to 20 days before being removed by the spleen. This is often in the form of an exchange transfusion, which can require many, many units of phenotypically matched red cells. This specifically requires a robust pool of donated red cells from people of African ancestry. And then there's other common surgical procedures like cardiac and vascular surgery, orthopedic surgeries and surgical oncology. And while these procedures have come a long way in the decades to not require as much blood, they still require blood transfusions, oftentimes.

**Josh Casey:** So, with all the essential medical uses for blood and blood products, how is the blood supply keeping up with demand? Is it?

**Michelle Mullens:** Blood donation is a critical and ongoing need, and it's driven by individual donors and nonprofit collection organizations like the American Red Cross, as well as other for-profit companies in the donor market. In general, the blood supply is not keeping up with demand, and there are several factors driving this. You mentioned earlier that just 3 percent of age-eligible people donate, so there's an inherent imbalance in supply versus demand. There are also seasonal factors that impact donation as well as demand, but overall we are seeing demand increase while donation rates are dropping. Right now it is the onset of summer, and several blood donor organizations have already issued urgent pleas for donors. That means we have less than a 1- to 2-day supply of red cells across the country. Now, while alternatives to natural blood have been researched for decades, there is no universally approved synthetic blood product available for transfusion. It has to come from donors. In the United States, part of what makes the blood supply system work is the ability to shift supply to the areas of greatest need. For example, if there's a natural disaster in one area of the country, blood can be diverted from other regions that may have a surplus or less need at the time to ensure that patients have the blood they need. For example, last fall during the devastating hurricanes that hit Florida in the Southeast, many collection centers were closed for days, but the needs of those local patients continued, so our ability to transport and pivot the supply is a real asset.

**Josh Casey:** QuidelOrtho is a trusted supplier to the healthcare industry for its ability to manufacture red blood cells that power some of the testing we talked about earlier. How does the blood supply shortage affect company operations and its ability to produce the necessary phenotypes?

**Michelle Mullens:** The blood supply shortage directly affects our manufacturing ability, as we also buy blood from the donor market. This can be especially challenging with rare blood donors and special phenotypes. When you look at the makeup of our panel cells, most of them are O-negative. This is, of course, considered the universal donor, but a closer look at the special phenotypes needed to create a panel shows that some of these units are quite rare indeed.

They can be literally one in a million units or even less frequent. There's a misconception that manufacturers have a special list of reagent donors or that we pay people for these units. That is not the case. We're able to purchase what is not used for the patients, which obviously come first.

**Josh Casey:** We know that post-COVID, the healthcare system has been plagued with staffing challenges and cost pressures. Beyond these blood shortages, are these issues also affecting blood banks and labs? If so, how are they managing the shortfall?

**Michelle Mullens:** Yes, the same staffing issues and cost pressures are systemic in healthcare today. Costs and demand are rising while reimbursement rates are being reduced, and the same staffing shortages that continue to stretch the healthcare system overall are having a profound impact on laboratories in particular. Automated blood testing solutions are a proven way to help labs deliver on their mission without compromising quality. These systems can automate up to 99 percent of a blood bank's workload to improve lab efficiency by eliminating manual processes while reducing the risk of human error. Automation can also help minimize patient wait times with faster testing turnaround. For example, the running of panels and aliquots on an instrument can greatly reduce pipetting errors and turnaround times. Our medical laboratory scientists are stretched very thin and often multitasking, but mitigating risk is paramount. Using an analyzer to perform antigen typing for these special units or the patient is another way that the technologists can free up their hands for other tasks and also facilitate better adherence to regulatory requirements.

**Josh Casey:** That's great. Automation sounds like the extra pair of hands that every lab could use these days. Now, if only there was a way to automate blood donation too. But that's all the time we have for today. Thank you, Michelle, for joining us to share your insights. I hope everyone enjoyed the conversation. Please be sure to review the sections and links within the podcast description. You can always go back and listen again if you'd like more details. Also, if you're thinking about donating blood and need more inspiration, we invite you to revisit *Science Bytes* episode number 36 on the surprising benefits of becoming a repeat blood donor. In addition to helping save lives, donating blood also burns up to 650 calories, reduces stress, and offers a range of emotional and physical health benefits. Check it out when you have a chance. Thank you all for listening in. If you haven't already, please subscribe to *QuidelOrtho Science Bytes*, our monthly podcast brought to you by QuidelOrtho Corporation, where we are transforming the power of diagnostics into a healthier future for all. Until next time, take care, everyone.