THE GRIFOLS ACADEMY
TRANSFUSION MEDICINE

Podcast Transcript:
Blood Inventory Management During the Pandemic
by Geralyn Meny, MD & Julie Karp, MD
Recorded June 23, 2022
Podcast Recording: US-DX2-2200021

Shawn: Hello and welcome to The Grifols Academy of Transfusion Medicine podcast series. My name is Shawn Leonard I am the Senior Manager of Global Education & Medical Affairs.

As part of its corporate responsibility, Grifols is highly committed to enhancing continuing education for the blood banking and transfusion medicine community. Our podcasts comply with all regulatory and compliance policies, and are entirely separate from all commercial operations. By listening to this podcast you are not conditioned upon any obligation to use, recommend, promote, or purchase Grifols products, nor is this podcast intended to influence you to do so.

The Grifols Academy of Transfusion Medicine is approved as a provider of continuing education programs in the Clinical Laboratory Sciences by the American Society of Clinical Laboratory Science P.A.C.E. program and the Florida Board of Clinical Laboratory Personnel. This podcast offers 1.0 Continuing Education credit. If you are interested in receiving credit, please listen for instructions at the end of this podcast. Please note that attendance is being monitored, and you must listen to this podcast in its entirety to receive CE credit.

This podcast is titled, "Blood Inventory Management During the Pandemic." Our host speaker today is Geralyn Meny, MD, and is joined by our guest speaker, Julie Karp, MD.

Dr. Meny is the Director, Medical Affairs Diagnostics, USA, at Grifols Diagnostic Solutions. Dr. Meny, a certified MT(ASCP)SBB, received her medical degree from UT Southwestern in Dallas, Texas, and completed residency training in pathology at Parkland Memorial Hospital and UT Southwestern in Dallas, Texas. She is board-certified in anatomic and clinical pathology and received subspecialty certification in blood banking and transfusion medicine. Dr. Meny obtained her MS degree in Biosecurity and Disaster Preparedness from St. Louis University. Her interests including understanding the global impact of transfusion medicine on patient and donor care and the future of laboratory medicine.

Dr. Karp is the Director of Transfusion Medicine and Director of the Transfusion Medicine Fellowship Program at Thomas Jefferson University Hospital in Philadelphia, Pennsylvania. She received a Bachelor of Science with distinction from Cornell University and her medical degree from the University of Pennsylvania. She completed residency training in Anatomic and Clinical Pathology at The Johns Hopkins Hospital, where she was also chief resident. She completed a fellowship in Blood Bank/Transfusion Medicine at Thomas Jefferson University Hospital. Her interests include undergraduate and graduate medical education specifically related to transfusion medicine, as well as blood donor health and recruitment. She is board-certified in anatomic and clinical pathology and blood bank/transfusion medicine. Thank you, Dr. Meny and Dr. Karp, for joining today.

Geralyn: Thank you very much, Shawn, for the kind introduction. Before beginning our discussion today, I need to mention a few words about disclosures. The opinions expressed on this episode are those of my guests and I alone and do not reflect those of the organizations with which either of us is affiliated, and regarding financial disclosures, Dr. Karp is being compensated for this educational podcast, and I am an employee of Grifols Diagnostic Solutions Incorporated. So, let's begin. We're all familiar with disruptions and supplies that occurred because of the pandemic. For example, you may have less-than-fond memories of trying to locate toilet paper or other items which disappeared off the shelves of your local grocery store or recall a lack of success when trying to purchase a car. But today's podcast will focus on another supply disruption, and that is the pandemic's disruption to the blood supply, which is unlike anything we have seen before. Dr. Julie Karp is here with us today to share her insights on the pandemic's impact to her transfusion service and the impact to patients under her care requiring transfusion. As Shawn said in his introduction, Dr. Karp is the Associate Professor of Pathology and Director of Transfusion Medicine at Thomas Jefferson University Hospital in Philadelphia, Pennsylvania. I am so looking forward to hearing her thoughts on this topic, as Julie led and continues to lead, a major city hospital transfusion service and donor center through the challenges of the pandemic. So hello everyone again and welcome, Julie.

Julie: Thank you for having me.

Geralyn: Well, before diving into sharing your wisdom on the blood supply and blood inventory management during the pandemic, let's set the stage with some background. So tell us a bit first about the blood bank at Jefferson University Hospital.

Julie: Sure. So Thomas Jefferson is a large academic hospital in Center City, Philadelphia. For those of you who are not familiar with Philly, Center City means downtown. Philly people like to have their own words sometimes. It's about a 900-bed hospital, which includes the main hospital and a neuroscience hospital that's just down the street. We transfuse about 30,000 blood products per year total. We have an irradiator on site. We support a level one trauma service, OBGYN that delivers about 2,800 deliveries a year. We have a full cancer center with a bone marrow transplant service and an ever-growing, it seems, cardiothoracic surgery service. We don't have any pediatrics patients beyond our neonatal intensive care unit, so this is almost exclusively an adult population. As far as the blood bank itself, the laboratory, we have three full-time blood bank transfusion medicine physicians, of which I am one.

We have a fellowship program. So we have generally one blood bank transfusion medicine fellow per year, as well as a pathology residency program. And the blood bank lab itself consists of about 25 or so people staffed over three shifts. As you mentioned, we do have our own donor center as well. We collect about 2,500 blood products per year, mostly whole blood donations. But we do make a few other things. Obviously we're making components from those whole blood donations, but we're also collecting low titer O whole blood primarily used by our trauma service as well as apheresis double red cell collections, platelet donations. We'll talk more probably about convalescent plasma in a bit. We did collect that for a period during the pandemic as well.

Geralyn: So you collect blood, and we'll get back to that in a moment, but you transfuse, you said 30,000 units per year to mainly adults. Is that a lot just as a frame of reference, just for our listeners. Just to think about that, is that kind of a lot? It sounds like a lot to me, it sounds like a lot of blood.

Julie: I would argue it's on the higher side of things. I don't think we're the largest hospital by that number. There, I know, are larger hospitals, some of which I've trained at, but we're definitely on the larger end of the spectrum for sure. I mean, this is a very large hospital with the very…

Geralyn: So it's a large and busy, right—So it's a large and busy hospital.

Julie: Definitely.

Geralyn: And it's in the middle, what you said, it's in the middle of a city and there's trauma. And so this is just to try to set the stage for what's to come over the past couple of years.

Julie: Correct.

Geralyn: So you're busy and it sounds like it because you've got three doctors and 25 people trying to just get everything ready and get it out to your patients. Now, what's also unique, it sounds like, and tell me again how unique this is, is that you collect blood. So where does all your blood come from to get all these units out to these patients in your hospital? Tell me more about that.

Julie: Sure. We have major blood suppliers, just like everybody else, generally speaking. The thing that you mentioned that is unique is that we do collect some blood internal to our own institution. As I said, it's about 2,500 blood products a year. So I usually say it's about 10% of our inventory over the course of a year that comes from our own blood donor center. This is not common. To my knowledge, we're the only hospital based in Philadelphia that has a hospital-based blood donor center, and I've become active with my colleagues at the AABB to talk about this. They have a new group talking about specifically hospital-based donor centers and the number that we usually quote is that there's about a hundred of us across the United States. So it is pretty unusual for a hospital to have their own blood donor center. It's not unheard of, but it's certainly not common.

Geralyn: So where do hospitals normally get their inventory of blood from?

Julie: Usually…

Geralyn: If they don't collect their own.

Julie: Right. So they're usually purchasing it from blood suppliers. So folks like the American Red Cross or New York Blood Center, those are the ones that are probably the closest to us geographically, but of course there are quite a few across the country that provide blood on contract. So generally there's a contract between the hospital and the blood supplier that a certain amount of blood is delivered, roughly speaking on a certain schedule, as specified and agreed to by both parties to make sure that the hospital has what it needs when it needs it to keep the patients getting what they need, when they need it.

Geralyn: So how was your, so this is again before the pandemic. So how did you manage your inventory? How did you measure it, and how did you manage it before the pandemic?

Julie: So, before the pandemic, which seems like a few lifetimes ago.

Geralyn: If you can remember…

Julie: If I can remember…LOL

Geralyn: I know I can't, I can't even remember…LOL

Julie: I would say inventory management was not as big a deal and that's part of the reason when you ask that question, it's almost hard to answer. It was kind of a blood bank problem, I think is a good way to put it. It was an internal issue, right? We knew what we needed. The blood bank knew what the blood bank needed to have to make the hospital run. We had optimal and critical levels that we had defined internal to us that we knew historically what we needed to have on hand to make sure that we could safely operate as an institution, that we would have enough on hand for unexpected things, but also have enough on hand for the things that we knew were happening every single day. Obviously again, we had those optimal and critical levels, so we were occasionally triaging. We'll talk more about that, I'm sure. We were occasionally triaging orders that would come in, but usually only when things were really critical, and things were only critical usually for relatively discrete periods of time. So we would have an event, a trauma or a patient who took a lot of blood for whatever reason. And then we would order more from our blood supplier and within relatively short time period that blood would arrive and the situation would be resolved. So that was largely how things existed. Pre-pandemic—we are part of a larger Jefferson Health System, which has grown significantly over the last decade. But generally speaking, we were an island unto ourselves. Even despite this health system, as far as the blood bank goes, we did not generally share with our enterprise partners. We were really sort of just focused on our institution and we worked directly with our blood supplier to make sure that we had what we needed. We also very rarely communicated our inventory out to anyone outside of the blood bank. It was really, like I said, it was a blood bank problem. We kept to ourselves, we knew what we needed, and we made sure that was being taken care of on a daily basis.

Geralyn: So you got what you, so you used these terms optimal level and critical level, are those numbers, so the blood bank knew a number of a blood type that they had?

Julie: Correct. Yes.

Geralyn: And go ahead. So just go expand a little bit more about what that yeah. Expand on that. Yeah. Thank you.

Julie: Those were, yes, they are numbers. So for each ABO and Rh type for red cells and as well for platelets, and for plasma, we had numbers, some of them fairly specific, and some of them maybe a little more general, particularly for the non-red cells, that we knew we needed to have on hand, to make sure that the hospital was sort of, flush with blood. In other words, we knew that based on how many surgeries we were doing, how many deliveries we do on a daily or weekly basis, what kinds of patients we have that

are here, and what sort of the usual demand is, we knew what we needed to have. And so those numbers had been defined over time. They weren't ones that we necessarily, that we've had in place forever, and it's also not to say that they can't get altered. So for example, I mentioned that we have a growing cardiothoracic surgery program. I think our numbers are sort of flexible in the sense that we are aware of the fact that as services in the hospital change, we may need to adapt those numbers. Generally speaking, though, they stay the same, but they're written in pencil, I would argue (LOL). But yes, we use those numbers to help us guide when we need to order more or when we have more than we need, and that's always been very helpful to us to make sure that we're not ordering too much or too little from our blood supplier.

Geralyn: And so you don't. So, if that worked pre-pandemic, and so you follow these numbers to know when you need to order more, and for the most part pre-pandemic, you call it the blood supplier, they can send it to you. Why did you collect your own blood?

Julie: It's a great question. Our blood donor center to my understanding has been in place for many, many decades, so this was not something that we started around this time.

Geralyn: Yeah. Right.

Julie: This is something that when I arrived at Jefferson over a decade ago was very much in place already, and my understanding is it's been in place probably since about the 40s or the 50s. So this is something that, to some degree, has been in place at Jefferson for a long time. I think before the pandemic, I'll be honest, it was a little bit of a luxury item to have a donor center. I think it's very unusual, relatively speaking, to have one, and so it was always sort of a luxury item. It provides a little bit of flexibility as what we can offer patients. In other words, if a patient wants a directed donation from a family member, it's a lot easier to do that when they can just pop downstairs and donate and that unit can then be sent upstairs to our blood bank. We don't have to deal with blood suppliers and the logistics of getting the product back from them. It also provides us with a little bit of flexibility as far as what we need. So in those rare occasions where there were difficulty getting inventory to the point that we need it, we could simply ask our own blood donor coordinator to recruit donors to fulfill a specific need. So if we were short on B negative units, we could say, could you recruit a few B negative friends today? Those units would be relatively rapidly available within a day or two for us to use to supplement inventory. It was also a great way to engage our employees, that sense of community that they're donating for their patients that they arguably might be helping care for. So there was just a lot of a little bit of warm fuzziness to go along with that. But, there was some really logistical, it was always just a nice thing to have. I don't think I appreciated how important it would become, which I'm sure we'll talk about, but that's sort of why we had it, if not just for historical reasons.

Geralyn: And so that I understand now how it kind of it was an adjunct to your supply. It wasn't…

Julie: Correct.

Geralyn: It was like you said, it was a warm, fuzzy, and it helped in some of your transfusions needs.

Julie: It always helped.

Geralyn: It helped. Right. It helped, but you didn't appreciate it as much.

Julie: I don't think even I did. No. Yeah. LOL…

Geralyn: Okay. So that was the pandemic from your blood bank side, from your transfusion side, and caring for your patients. Blood supply needs were met. There were occasional triage issues?

Julie: Very rare.

Geralyn: But very rare and what did they tend to be? Was it a trauma? When were there difficulties, if you want to call, use that term difficulties, what were they?

Julie: I would say on the rare instances, pre-pandemic that we triaged, it was usually due to blood supplier issues, and it was usually almost predictable. So either bad weather, it occasionally snows here in Philadelphia…

Geralyn: Oh yeah.

Julie: Or if a large snowstorm took out us and New York and Boston, so usually things like platelets and things like that. So, things that you knew, we're getting 20 inches of snow, this should be an interesting weekend. That kind of thing. Occasionally it was summertime. We know that, blood donations in the summer are often a challenge. People are off doing fun things and donating blood is lower on their list of priorities, or they're away from school or their workplace, or what have you. So sometimes in the summer, things would get a little bit lean and again, hopefully our donor center was able to pick up some of the slack there. It was usually not specific discrete events. It was just sort of, oh, this is what happens and it's not a big deal. It's temporary and we'll get through it and it'll be a discrete period of time and then all will return to normal. I would say the only other thing was that early starting at about 2014, before the pandemic obviously, we were starting to rev up our patient blood management efforts. We have a nurse practitioner on staff who spearheads those efforts and so that was largely the other sort of triaging, I guess, that we were doing a little bit of, mostly retrospective. So in other words, the order would be filled without question, and then there would be some amount of documentation after the fact where we would look retrospectively at the order and maybe engage with the provider to say, why did you make that decision? What could we do differently? How can we help you? But that was probably the extent of it, pre-pandemic, was either sort of spot issues or toward patient blood management efforts, mostly retrospectively.

Geralyn: So at that time you, there was the looking internally to say, is this transfusion really needed? Do we really need to transfuse and beginning your blood management program…

Julie: But mostly after the fact. So we weren't interfering with an order, the order was placed, the order was filled.

Geralyn: It wasn't… it was retrospective rather..

Julie: Exactly. It might even be a day or two later that we were looking at these to say, oh, Dr. So-and-so ordered this. Hmm. Not sure that's in line with patient blood management guidelines. Why don't you reach out to that physician and ask what their thought process was? Was there more to this story clinically that would make more sense? Or is this an opportunity for us to optimize patient blood management, provide some education and hope that in the future, they might make a slightly different decision.

Geralyn: OK. OK. Is there anything else you want to add about pre-pandemic? The transfusion service, the donor center side, and/or the clinical side that you think is important to mention right now, before we hit the pandemic.

Julie: I guess overall, and I think this will come up later. I think overall the blood bank was a very insular, isolated place in the sense that we didn't interface that much, certainly not on a daily basis, with our non-blood bank colleagues in the sense that our operations were really our operations. We knew what was going on. We took care of us. We made sure that everybody else had what they needed, but that was not something that was, there was not a lot of dialogue about that. I think the tacit assumption was that, especially on the outside, looking in to us, was that, well the blood bank has what they need. Right? LOL…

Geralyn: And vice versa!

Julie: And vice versa!

Geralyn: And vice versa!

Julie: Exactly!

Geralyn: Right?!

Julie: So I think there were a lot of assumptions and not a lot of communication. I think that was a fair assumption on their side, my clinical colleagues, that if they heard nothing, all was well, and they knew that we were taking care of us and they were going to take care of them and everybody went about their business. I think the pandemic and the things that happened over the last few years have really upended that, and we are no longer our own island.

Geralyn: Let me, and this, that just brought something to mind. Was there disaster planning? Not that you can plan for this per se, but was there participation of the blood bank in disaster planning so that when this hit everyone at least knew everybody, or what was that kind of put to the side because everybody was busy. Everybody was busy, anyway?

Julie: We had a disaster plan. We've always, to my knowledge, at least during my tenure, we've always had a disaster plan. So I don't want to give the impression that we weren't communicating with our colleagues. I just want to emphasize that it was relatively limited, at least in retrospect, maybe it didn't feel that way at the time but I think there was a sense that the blood bank was in charge of the blood bank and that was a blood bank problem. Our disaster plan in retrospect, I think really was looking at more localized disasters, so things like physical plant issues, floods, fires, maybe even up to and including things like

mass casualty events, I think unfortunately, have reached our consciousness and so that was already being discussed and included in disaster plans. I don't think, I know, that a global pandemic was not part of the disaster plan, and I don't think national blood shortages to the extent that we have seen in recent months and years was part of the disaster plan. I think that the tacit assumption was always that the blood supply was okay. It was just “us” that was the issue and then once we got “us” squared away, whether it was a flood or a fire or a mass casualty event, that the rest of the system would be there to sort of buttress us up. And I think that's where our disaster plan is now a work in progress, because we've learned that there are now lots of other types of disasters that we weren't maybe thinking of as much as we should have been.

Geralyn: No it is. It's fascinating. Okay. All right. Now let's move on. Let's move on to February and March of 2020, and what happened. March, I guess you could say March, February, March, and so you kind of know what's coming, or you don't know what's coming, but you know the pandemic is going to occur. So kind of describe what happens, and I don't know how you want to break it down, but COVID hits in March and there's a shutdown, there's basically this shutdown and you're inundated. So you can't collect blood and you're inundated with these very sick people. They're very sick. What happens and just tell me what happens to your hospital, to your transfusion service, to your donor center, to your ability to get blood? What happens that first year?

Julie: So it's such a long couple of years and it really is.

Geralyn: It is a long, it is it's long to, until we get to now.

Julie: So those first few months I would say were kind of a discrete period as probably was the case for a lot of things. At the very, very beginning, it was obvious the blood supply was a concern. I think all of us in our field automatically said, well, what's going to happen? And we really didn't know, obviously just like everybody else for lots of things. We really didn't know. I think the first thing that happened was that obviously, as you said, everything shut down, but the funny part was the hospitals didn't, right? At least maybe the schools shut down, offices shut down. Lots of other things shut down, but the hospitals were probably one of the last things to really be unaffected. So in those first few weeks, it was honestly, we were very concerned in the blood banking community because the hospitals seemed to be just running at full tilt, but everyone else went home from the community. So there was a concern in those first few weeks that how are we going to keep the blood supply going if the hospitals are still running at full tilt and everybody's at home and nobody's donating blood? So for those first couple of weeks, there was true anxiety. Both on me personally and us as a community for the blood bank world. How are we going to keep this going? Then things changed a little bit, a lot. Suddenly the hospitals started shutting down a little bit. Regularly scheduled surgeries started getting postponed. Things that were not critical started getting postponed, and we started seeing people in the hospital with COVID. Our staff started getting sick and so there was a concern there. So that was something that sort of changed the game a little bit because no, we weren't getting the numbers of blood donors that we had been getting in the months and weeks before, but suddenly we didn't need as much blood in the hospital because surgeries were being postponed and people were staying home. There were fewer car accidents and fewer injuries and

traumas because people physically weren't leaving their house as much. Suddenly the need that we had had sort of almost matched the donations. It wasn't as big a deal. Suddenly it became pretty obvious that we were going to be, at least for the time being, able to keep up with what was needed. I think also we were just learning about COVID. Once we became aware that most COVID patients don't require transfusion, I think our level of panic in the blood bank world went down quite a bit. COVID is not a blood heavy diagnosis and so, barring things like ECMO or other much more advanced care, we weren't looking at something where we were going to need a lot more blood than we were used to. That sort of put the brakes on the panic. As far as getting blood again, I think we were definitely getting less blood than we were before the pandemic, but again, our needs were just less, less was happening in the hospital and so it wasn't as scary as we thought it was going to be.

Geralyn: So it balanced out?

Julie: Yes.

Geralyn: It balanced out between the blood that was coming in from your blood supplier was less, but your usage was also less…

Julie: Correct.

Geralyn: …because your hospital was not performing the surgeries or having the types of patients in that were using blood?

Julie: Correct.

Geralyn: So it balanced, it balanced out?

Julie: Correct.

Geralyn: How long did that go on?

Julie: I would say that probably went on for most of 2020. As many of us were still working from home. Kids were home from school. That's sort of the state that we lived in for a little while where things were just sort of quiet and different. The only other thing that I think that happened during that first year was convalescent plasma. That was a big challenge for us as an institution because we had our donor center. There was an expectation that we would be collecting convalescent plasma when it was thought to be, and in some circles is still thought to be, potentially useful. So there was an expectation that we were moving towards that. We did start collecting convalescent plasma, I believe it was in April of 2020, which was very challenging because there were a lot of new FDA requirements and changes and things were moving at a pace that most blood bankers are simply not used to working at, so we had to make a lot of really big changes really fast, not only to change donor requirements for regular donations, which came to pass, but also to start collecting a brand new product that we had never made before.

Geralyn: So that happened in your donor center. Did you still continue to collect all the other products that you were collecting?

Julie: We did, or at least we tried to.

Geralyn: Okay, and then you had to add this product on, in addition?

Julie: Correct.

Geralyn: Did that plasma go to certain patients? Or how was that managed? Tell us just a little bit about convalescent plasma. What was it and who did you collect it from?

Julie: So convalescent plasma, which could be an entire talk unto itself.

Geralyn: Yeah. And just, I said just a little bit.

Julie: Basically we were taking patients who had recovered from COVID and, with the assumption that they had antibodies circulating in their blood, that we could then collect their plasma and give their antibody-rich plasma to patients who are actively being treated for COVID with the hope that those antibodies would hasten their recovery or lessen the extent of their disease. There was a lot of enthusiasm about this at the very beginning of the pandemic; primarily there was some very promising, very preliminary data out of China. There had been use of convalescent plasma for other similar viruses in the past, so folks were really excited about it because even to this day, we really don't have a great treatment for COVID. There was a lot of hope that this might be one of our answers, one of our tools in the COVID toolbox. I don't think it's panned out exactly the way we all thought it would, but certainly in those first few months of COVID, that was the hope. So there was an incredible amount of enthusiasm to get this product created, and obviously it took a few weeks because we needed people to get COVID and recover from it in order to find these convalescent people. But once those convalescent people started occurring in larger numbers, we were then tasked with the idea that these people need to donate their plasma to give to other people who are getting sick. Again, because we had that donor center in-house, the very good assumption was that, oh, you could do this? The answer was, yes, we could and we did, but that doesn't mean it was easy. That doesn't mean that it was something that we were prepared to do, and that doesn't mean that the people that I work with and my colleagues around the donor center, that doesn't mean that we weren't professionally or personally impacted by the pandemic ourselves. And so it was just a really challenging time to try to just navigate day-to-day life to make sure that we were able to bring this new product in that everyone was so enthusiastic about. We did, but it was a challenge to be sure.

Geralyn: Now, how was your staff during this time? How were they?

Julie: So during the first few months, I think it was a real challenge. Obviously nobody knew what was happening. Nobody really understood how you could get COVID or how you couldn't get COVID. We're all wiping down our groceries and things that we probably have all long since abandoned, but I think there was just a lot of anxiety, particularly when people work in hospitals, obviously we're coming to a place where we know that people are sick. We know that this is where our COVID patients are coming to, and yet we're still expected to come to work and potentially put ourselves at risk individually. I think that was a huge challenge. I think there was a lot of anxiety for the blood bank in particular. As I mentioned, we have 25 employees, which for many blood banks is a lot of people, but we have that many

people because of the level of complexity of our patients and how many blood products really do get moved through our institution every year. There's a lot of work to do, and so there was a lot of concern, particularly at the supervisory level, certainly at my level, what would happen if too many of our employees were sick? What would happen if too many of our employees couldn't come to work? How would we keep the blood bank running? How would we make sure to do that? What we wound up doing for the first couple of months is we wound up being very strict about the employees overlapping. So before the pandemic started, it was not uncommon to have some employees sort of dovetailing over shifts for a variety of reasons. When COVID started, we were very specific. If you are on first shift, you would have no contact with second shift and if you were on second shift, you would have no contact with third shift. We literally had one shift of people walking out the front door while the second shift came in the back door and they were not to say hello. They were not to talk to each other. They were not to breathe on each other. Everybody had to wear a mask and you had to stay on either ends of the hallway where one went out and one went in. That way if one shift did become sick and a number of people needed to be out, it wouldn't take out two shifts worth of people.

Geralyn: It wouldn't take out everybody. Wow!

Julie: So there was really a human issue. It was social distancing at its most extreme where we're talking about shift distancing, if there was such a thing. So that was another thing that we did. I think there generally was just a lot of anxiety and a lot of upheaval. It was just a really challenging time for everybody, particularly for us.

Geralyn: So that first year was characterized before and then the vaccine obviously was developed.

Julie: Right.

Geralyn: So that was characterized by anxiety by the convalescent plasma, if you needed blood, if you happen to need blood, you actually had enough, I guess, for a while, because no one was using it.

Julie: Yeah.

Geralyn: And so you had what you needed.

Julie: Generally speaking. Yeah. That was the trend. I spent most of that first year talking about convalescent plasma. That's all I really talked about. LOL

Geralyn: So then the vaccine comes out and so the vaccine comes out and then we think, oh, it's going to end. It's all over.

Julie: It's over!

Geralyn: It's over! We're going to be happy people and then the variance shift.

Julie: Yes.

Geralyn: But we're in a business model that it's kind of like hybrid where we go to work and some of us don't and some of us do, but schools are still hybrid and the major blood suppliers, their donors predominantly are in schools, and so they're still barely collecting blood if at all. And this is where you're going to think maybe in a better position because you have your own donor center. As the pandemic goes on and these variants come into being your elective surgeries, I guess, kick back in because you go back to work and people get vaccinated and they need to have our elective surgery. So those come back in and so blood is needed, but all of a sudden it's not there. So I guess this is like 2021, the end of 2020, the beginning of 2021. Pick up there and tell everyone what happens now in your hospital and all the other hospitals.

Julie: Yeah, I think 2021 was sort of where I guess, after the vaccine started really getting picked up. So, most of us, at least in healthcare, I think it was late 2020, early, the first couple of months of 2021, where vaccines were really available for our healthcare workers, at least, and then certainly to the greater public, moving on beyond that, I would say it was summer of 2021 where the wheels started to come off a little bit. The summer in particular, because summer is always hard to collect blood. Summer is always the time where people find something else to be doing other than going to work and going to school, right? I think it was that it was summer of 2021, where we started noticing we were having some inventory challenges from our blood suppliers. They were still not, as you said, allowed into places, workplaces, there were questions about vaccination status. Are we allowed to go into places if we're not vaccinated because people had rules about that. Then as you say, things started picking up in the hospital. All of a sudden our staff was vaccinated. Some of our patients were vaccinated. We were all sort of starting to think that this was the beginning of the end of the pandemic. Okay, we're going to get all these surgeries done that we said we were going to do months ago, everybody, all right, everybody come back, come back, come back, come back. So the hospital started becoming much more like it used to be before. And that's where we just started seeing the disconnect where the blood suppliers were not able to do what they did for us before. The hospital started looking a lot more like it did before, and that's not balanced, that there is a disconnect there. I think it was something like the summer of 2021 where we all went, uh oh, this might be a problem. I think that's where our donor center really started to kick in. Obviously our donor center was a big deal, even at the beginning of the pandemic because of convalescent plasma. That sort of fell by the wayside. We stopped collecting. There wasn't as much interest in it. We had stuff stockpiled in the freezer. It wasn't as important as it was early on and now we're pivoting to, it's not about convalescent plasma. It's about keeping blood products on the shelf. It's about making sure that we have a little bit of wiggle room to make sure we have what we need to keep the hospital where it needs to be so the focus of the donor center shifted yet one more time.

Geralyn: So what happens? So if you try to get blood first from your blood supplier…

Julie: Yes. Always.

Geralyn: Always. And what happens if they say they don't have it? What happens? What happened?

Julie: Yeah. So I think that was—.

Geralyn: Tell me what happened.

Julie: So we're used to that happening occasionally. Like I said, in pre-pandemic every once in a while, we would have a bad couple days because of snow or because of the summer or because of whatever. But this summer of 2021 was probably starting to be the first times we're noticing that this is happening more often. This is happening for more prolonged periods of time, and we're starting to sort of realize that as much as our blood suppliers are critical to how we function, that maybe they're not perfect. Their staff are humans, their staff get sick, their staff leave, their staff need to be trained, places that they need to go to collect blood aren't always going to be available to us. It started to become a little obvious that our blood suppliers were struggling, that they were having challenges. And they were pretty transparent about that. They were pretty open about the fact that the things that they had always done before were starting to not work as well as they used to. I think, again, that's where we started making changes internal to the blood center, to our own donor center, rather, and certainly the hospital to realize that we need to start having conversations about what do we do when we don't get enough blood? What do we do when there isn't what we expected on the shelf?

Geralyn: And so what did you do? So if someone orders blood, they order a couple units of blood and you are seeing you're not even getting your numbers, the inventory numbers that we talked about earlier, what did you do? What did you do internally with doctors that you work with to say, Hey, we, we have a problem now.

Julie: At the very beginning…

Geralyn: What were some of the things?

Julie: At the very beginning of the pandemic—so going back to 2020, just for a second, we started doing a little bit of prospective review. Meaning, that when somebody's ordered a blood product in real time, we would look at the order and maybe start a dialogue with that clinician to say, can we discuss what you ordered? Can we discuss how we might be able to change that? We were pretty liberal. We were looking at mostly orders where the hemoglobin was greater than 8 g/dl. We were not as systematic necessarily. We were doing this more because, I think, just to relieve some of our generalized anxiety about the blood supply. It was also a movement towards our patient blood management goal saying the pandemic is kind of scary, and this is something we've said we were going to do. I think this is the time that we need to really sort of buckle down and do this. So we started doing that really, basically, almost at the beginning of the pandemic, not knowing what was going to happen to the blood supply. I don't think we were doing it with the vigor that we're doing it now. So that continued and then sometime, I think it was around, I want to say it was late 2021, when we realized that we had a real serious blood crisis on our hands, that we stepped up our efforts significantly. I mean, significantly. We were now looking at blood orders in real time, prospectively for any patient whose hemoglobin was greater than 7 g/dl, which for many physicians is pretty draconian. I can say that we did definitely get some negative feedback on that. The reason we were doing it was not necessarily because we found that this was a fun way to lead our day but our blood suppliers were putting us on a diet. This started a little bit in the summer of 2021, but it really hit home in probably December of 2021. When as I'm sure you can recall, and we can discuss further, there was a true blood crisis in the United States, particularly in some parts of the country, but largely, pretty much

across the country. Particularly here in Philadelphia, we were feeling it. We were on a diet, we were being told by our blood suppliers that you could only buy a certain amount of blood per day, and any order beyond what your diet was, would largely be denied. So we were told, this is what you're getting, and you need to figure out how you're going to use it. It was something that had never been done before. We had never had that kind of limitation on what we could order. We were told very clearly that if we needed more, we likely wouldn't get it. In other words, if we had a patient that used a lot of something replenishing after the fact would be almost impossible, and that was very scary because as I explained to my clinical colleagues, we are basically functioning without a net. We're doing some pretty fancy tricks and there is no net. And the net of course in the past was always our blood suppliers, our robust blood supply that we were all collectively counting on, which was no longer there. Particularly December of 2021 was a very scary time. This was all very new and very different.

Geralyn: What were some unique things that you did in the blood bank to help take care of patients that you hadn't used before? For example, somebody ordered two units, you gave partial, or you said, wait till the donor, our donor center collects, or were there things that you did to help take care of patients that again, others may not have been able to do?

Julie: Yeah, we were triaging a lot, as I said and as you say, we were if somebody ordered two units, that was an automatic conversation we really couldn't afford to give them two units even if it was—obviously if it was clinically necessary, that was a different story, but again, there was still a dialogue to discuss why it was clinically necessary. The triaging, frankly, at that level, to that degree, with that frequency, that was different for us. We did offer split units for a period of time, December 2021 to about March of 2022. Our blood bank, largely because we do manufacture blood products, we are able to do that. A lot of institutions don't have the infrastructure to do that. But we could, we were able to split units in a sterile fashion. I was regularly offering people half units of red cells. For example, if the goal was, for whatever reason, a hemoglobin of 8 g/dl, whether because of cardiovascular disease or whatnot, and the hemoglobin was 7.8 g/dl, and the clinician was very clear with me and my colleagues that they wanted the hemoglobin to be 8 g/dl. I could say, well, I appreciate that, I understand that and I'm happy to support that; however, you will not be receiving a full unit of blood. You will be receiving a half unit of blood, and that will get your patient above the goal of 8 g/dl. By and large, our colleagues were okay with that. I think one of the things that was unique about this time, particularly around December 2021 to March of 2022, was the communication, the knowledge, the understanding on our clinical colleagues' side, what was going on in the blood bank. Again, before all this? It was the blood bank's problem. Nobody called us very often, as far as, how was your inventory today? Nobody cared. The assumption was that it was fine. It wasn't that they didn't care, it's that they knew we were doing a great job, and the blood kept coming. And suddenly in December of 2021, everybody collectively, because of the news, because of notifications that we were pushing out to say, we have a problem. This is a crisis. Everybody collectively, became much more aware of the fact that the blood bank is a place. The blood bank is a place that relies on the world to make sure that it has what it needs and if that world spins into chaos, that might not be the case anymore. We might not have what we need. And so we were having conversations that we've simply never had before. In that period, we were suddenly telling people in the hospital system, in our own institution every day what

our inventory was. That had never happened before. This was a complete non-issue. No surgeon had ever asked me in the morning, how's our inventory, and now this was becoming a daily occurrence. We were having conversations and communications that simply had never occurred before. We started sharing our inventory verbally, then we started sharing it on a shared document that was available for folks to see. Then we started having it automated at a point much later in spring of 2022. It is now publicly available within our health system for folks to see what our inventory is. I always tell people, it's kind of like we opened the door to the blood bank and now we're in a glass box. We used to be a black box. Now we're a glass box. Everybody basically knows what happens in the blood bank now. The other thing that we started that we had never done before. We now have a secure chat group through our electronic medical record, where shortages, even to this very day, are being publicly shared with whomever chooses to join that group, usually our high-use services. So our surgical colleagues, our BMT colleagues, our trauma colleagues, so that they know when our platelet situation isn't good or when we're critical on a specific type of blood. Largely that has abated to the current day, which we can talk about. But it's interesting because those couple of months, late 2021 into early 2022 has largely changed how we do business. We are now an open book and now the expectation is that we are transparent with what inventory we have. In the past the assumption was it was always there and I think everyone, me especially, realizes that might not always be true anymore, and we need to be able to share that information with the people that are counting on us.

Geralyn: Did you ever run out of anything? Did you ever run out of blood?

Julie: We never ran out of blood, no, but there were definitely some days where we had far less than I was frankly comfortable with. That was where we were having minute-by-minute conversations with our clinical colleagues to make sure that they understood where we were. I would like to think that every patient who needed something got it. I didn't get too much feedback. As far as that there were any bad outcomes that I'm aware of, but it was a very tenuous time where hard decisions did need to get made. And sometimes things did wait a day or an hour or a couple of hours, or that we made some hard decisions to say your patient needs this, but they don't need it right this minute. They can wait three hours until our new shipment comes in and we're prioritizing this other patient who really does need it this minute. I don't think anybody went without. I think everybody either got a little less than they were hoping, like a half unit, or they had to wait a little longer than they might have originally had to wait. But I think we worked incredibly hard to make sure that everybody who absolutely needed what they needed when they needed it, got it.

Geralyn: What's the status now? So we have gone through the beginnings of the pandemic, because we're in the new normal now.

Julie: Yes.

Geralyn: I can't say it's the middle or the end, it's still the pandemic. So we're in our new normal. What is the status now with regard to your managing the blood inventory and the blood supply? Is it steady? Is it, you feel comfortable with where you are or what, how would you characterize it now?

Julie: I think it's the new normal for blood bank too. I think we're a little burned by what happened in late 2021 and 2022. I think I/we feel a little bit more fragile as a blood supply than we did before. I think we all felt like that we could weather the storm and, up until that point, we really had, by and large. We had stepped up, we had collected convalescent plasma, we had done everything that the pandemic had thrown at us. We had largely been able to handle up until about December of 2021 when the wheels really came off. So I think we're all still a little bit recovering from that period. I'm really curious to see how long I think about that time. I think it's going to stay with me personally for a very long time in my career. It was a very tenuous time and it was really things that we had never seen before had happened. I think we're getting used to this new normal of transparency where we are actively sharing our inventory, where I am talking to my clinical colleagues with much more regularity than I ever did in the past to make sure that they know and they understand what it takes to have a blood supply and a steady blood supply and how that may impact them in their patients. I think we're just trying to sort of figure out what that new normal is. I think we're all collectively just worried to some degree that could happen again. For the moment it doesn't seem to be, it seems that things have largely corrected, but I think going through something like that, seeing something change that much, that quickly, it's a little scary. I think it does change how you look at things moving forward.

Geralyn: Well, on that note we're at the end of our time, so I want to thank you Julie for taking the time to share your expertise. It's been excellent discussion on the blood inventory management during the pandemic, and I will now turn this back over to Shawn to conclude this podcast.

Shawn: Thank you, Dr. Meny and Dr. Karp for this wonderful conversation. This concludes today's podcast. You may find any references pertaining to this conversation on the Grifols education website. In addition, if you're interested in receiving continuing education credit for this podcast, or if you would like other information about our education programs, please email TSEC@Grifols.com. That's T-S-E-C @Grifols.com. Thank you for listening and we look forward to your participation in our future educational events.