BBGuy Essentials 043CE:
Practical Tips to Influence Transfusion Practice with Mark Fung

Joe Chaffin: This is the Blood Bank Guy Essentials Podcast, episode 043CE.

[INTRO MUSIC]

Joe: Hey, everyone, welcome back to the last episode of the Blood Bank Guy Essentials Podcast for 2017. My name is Joe Chaffin. I've got a really, really helpful interview to share with you today about influencing transfusion practice in your facility. But first, I should let you know right up front, this is another continuing education episode, and both doctors and laboratorians can get free continuing education for listening to this podcast and doing an assessment and evaluation on TransfusionNews.com [NOTE: Actual address is: WileyHealthLearning.com/TransfusionNews]. Hey, you know what? It's almost the end of the year, so I hope you take advantage of this CE episode (as well as the previous 2, which were 039CE and 040CE).

Now, in order to this, we have to do a little legal stuff, so here is that:

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OK, now for today's episode. My guest today is Dr. Mark Fung from the University of Vermont, and he is here to give us six practical tips for influencing transfusion practice in your hospital. The tips are useful no matter what role you serve in your hospital, and they are designed to be a "how-to" guide to getting started or improving an already existing program in patient blood management in your facility.

Mark's name is probably familiar to you. There could be a couple of reasons. First, he's a previous guest on this podcast, episode 017, where he talked about transfusion reactions (that is actually one of the top 3 most downloaded of all podcasts that I've had so far). But more likely, you've heard his name because he is the editor-in-chief of the 18th and recently released 19th edition of the AABB Technical Manual (which is my go-to textbook for blood banking). Mark is a professor at the University of Vermont, where he is vice chair of quality and clinical affairs in the Department of Pathology and Laboratory Medicine, and director of clinical labs at the University of Vermont Medical Center.

Mark has lots of great ideas, tons of useful tips, regardless of whether you are a blood bank doc, a resident, a nurse, a clinician, or a laboratorian. So, here we go! I hope you enjoy my interview with Dr. Mark Fung!

Joe: [03:48] Well, hey Mark! Welcome back to the Blood Bank Guy Essentials Podcast, dude. Good to have you!

Mark: Thank you. Glad to be back. By the time this recording goes out, it will be December and hopefully there will be lots of snow in Vermont. I am looking forward to another wonderful snowboarding season, global warming aside.

Joe: Mark, the last time we talked last year, in 2016, you were in the midst of what I know just had to be a gargantuan project for you. I was super-excited at the recent AABB Annual Meeting to finally get my hands on the 19th edition of the AABB Technical Manual. So obviously, it is out, and you are the editor-in-chief of both the 18th and the 19th edition, which just came out recently. Why don't you tell everybody about it a little bit? In particular, obviously, I'm interested in how that process goes, but I'm also really interested in, for my audience, why should they buy the Tech Manual? Why is it an important book?

Mark: Sure, some shameless plugging for the 19th edition of the Technical Manual. It just came out at the October [2017] AABB Annual Meeting. You know, certainly what's unique about the textbook, and I've been very privileged to be part of it, is unlike a lot of other textbooks, this is actually associated with a professional society. It's associated with the AABB, and it takes advantage of all the AABB committees and members in terms of the book. The reality is the heavy lifting is really all the coauthors, authors who write all the chapters that then are vetted by a number of the AABB committees, which are representatives from the transfusion medicine

community. So this is one of the few books I can think out there that, as part of the chapter vetting process, it goes before a number of the committees on the AABB, depending on the topic for feedback. We don't always agree with the feedback, but we tend to at least take many of the points and comments into consideration. And then, my associate editors working with me, Anne Eder, Steve Spitalnik, and Connie Westhoff have been fabulous!

Joe: Well that's an OK group. Those three are all right, right? [LAUGHS]

Mark: Yeah! The four of us, what we do is we just divvy up the chapters, and we "birddog them," we gently remind the authors when they're due, and then they come in and then they go out for a review to the committees, come back to us again to adjudicate whether we agree or disagree with some of the comments made. And then, right before it goes to the publisher, I eyeball it one last time. But it's a great book in that respect, because it does take into account the committee membership, more of the transfusion medicine communities' input. We do conduct a survey every once in awhile to make sure the book is connecting with what the readership wants. This book is entirely reviewed from beginning to end by the AABB's regulatory and accrediting staff at the AABB main office, as well. So we try as much as we can to make sure any statement that's made in there is consistent with or supportive of what the AABB is trying to do from accreditation. So we try to make sure we don't steer people the wrong direction. If the accreditation has one direction and the book says something else, we try to avoid that.

Joe: Honestly, the book has come a long, long, long way, and I think you've played a strong part in that, as well as some of the previous editors. I mean, when I first started in blood banking (and that's a long time ago, Mark), but I would say that the Technical Manual at that point was a lot more of a, well, it was like the title: A "technical manual." But now, man, it's a GREAT textbook, it really is! Those of you that are listening, it is my "go-to" textbook for blood banking. If you need one textbook for blood banking, from my perspective, that's the one for you to get. It's practical, it's easy to read, it's useful, and it's accurate.

[08:03] So Mark, we need to get to what we're talking about today, which is, you're going to share with us some practical tips to influence transfusion practice. And I think that this is such an important topic, and for my audience, from clinicians that may be listening to this, to students that are learning this, it kind of brings us around to a, well, it's kind of a "buzz-phrase," I guess, it's a phrase that gets thrown around a lot today, and that's "patient blood management." So I think it's important before we get started with your tips, let's just step back for just a second and talk a little bit about that phrase, patient blood management, and what it might mean. From your perspective, Mark, when you hear "patient blood management," how does that strike you and what kind of things does it make you think about?

Mark: [08:50] Sure. I think the way to think about patient blood management is, how does it differ from blood utilization? And I think the way to think about is, patient blood management is MORE than just how many units of blood we're using, but what are we doing beforehand to assure ourselves that we've given the patient every possible chance to be able to not come in to a procedure anemic or coagulopathic? What do we do when we're in a particular surgical procedure to minimize the amount of bleeding? And then, what can we do afterwards in terms of not continuing to make the patient bleed more, or for that matter, make them more anemic (whether it's by drawing too many lab samples before or after)? So really, the way to think about it is, it's a whole-body, whole-patient approach, versus just strictly the sliver of, "Well, how many units am I putting out the door?" And certainly, classically, we've always been very focused on asking the question, "Is the blood use appropriate? Are we transfusing our patients with regards to risk-benefits?" But this goes beyond that, because if the patient comes in fully replete with, whether it's their iron or otherwise, you know, when they bleed, their hematocrit is starting from a much higher number, so they might never even come close to the transfusion triggers that we might normally think of.

Joe: Yeah, I think that's really important. I wonder if you'd comment on perhaps...how shall I put this delicately and with a little bit of sensitivity? I think that my perspective is, sometimes people on the administrative side in hospitals perhaps see projects related to patient blood management a little bit differently than we do in the transfusion medicine world. Could you talk a little bit about what things we should be prioritizing in terms of what's our intention? What are we trying to do here?

Mark: I think the thing to think about is certainly we wear our health care provider hat first of all. We are looking at, whether it's patient experience, or more importantly, outcomes. We want patients to come into the hospital and leave the hospital hopefully better than when they came in, and giving a blood product might or might not do that. We are trying to reduce blood utilization from the perspective of thinking that, whenever possible, let's not give them a stranger's blood if we don't need to, because there is some potential association with worsened outcomes. The data is not always clean, because a lot of the data is observational. You know certainly from the executive suite side, most of the hospitals, they look at the blood bank budget, it probably clocks in the millions of dollars range. Even my small hospital, we're about a little bit under 500 beds, blood supplies in the past has been between three and four million dollars, if I remember correctly. And so for them, they see that number. They're always going to ask, "Well, how can we save on this?" Certainly there has been a bias towards that there is room for improvement in terms of lowering the use of blood, and certainly most of us do agree that blood is used more than is necessary. Although I would argue in the past 10-15 years, we probably have been using substantially less blood since when even I started in the field 10-15 years ago. On average, my understanding around the country, we've

experienced, hopefully for all the listeners, they're seeing at least a 20 if not a 30% decrease in blood use, as folks around the country realize that they can be more sparing around it. So you know, certainly there's always that focus on the numbers, but I always, and we'll probably touch upon this a little bit later in the program, but I always remind folks that from the blood bank, (just like we're just talking about the Technical Manual), I don't get, or pathologists who are directing the blood bank get a "blood bank bonus" because we did not use as much blood.

Joe: Dude, this sounds like something we need to implement! [LAUGHS]

Mark: We neither see an extra check for "selling more blood" to the patients, nor do we get money if we use less of the blood. Most of us are on straight salaries with regards of this part of the business. So really the focus is on what's best for the patient. I always tell (this is what I mean when I say I'll come back to this), I often will tell my clinicians, "Remember, I'm just as likely to come to you to say 'I think this patient needs blood' as I am to to come and say 'I'm not sure this patient needs blood.'"

Joe: [13:50] That's so important. I couldn't agree with you more, Mark. I think our intention is really, really a crucial part of this, and I think you summarized it perfectly. So with that, let's move on, and we're going to give folks **six practical tips to influence transfusion practice**. And we're going to start out fairly generally, with just what you've discovered in your looking at the literature and in your experience. And then at the end, we're going to come around and see what you guys did at Vermont, and how specifically you implemented some of these tips, and what your results were. Let's start with the first one. And that would be to implement educational initiatives. ***Tip 1: Implement educational initiatives***. What can you tell us about what the literature says about the effectiveness of trying to teach people about how to transfuse more wisely?

Mark: [14:42] Sure. You know the problem with the literature, and the short answer is depending on who you ask in the literature. There's a relatively older paper now by Alan Tinmouth in the Archives of Internal Medicine, probably in 2005, where he did a nice systemic review of the literature, and from his review at the time, the range of reduction in blood use was somewhere on the order of as little as 12% to 79% reduction in blood use. But if you look at more recent studies, there's a nice paper in Vox Sanguinis in 2017 by, the last name of the author is Abelow. He was looking, I think about maybe 8% total decrease in total red cell transfusions. So much more modest use. The problem with a lot of these studies, of course, is they're very short timeframe. They do education and they look what happens the next six months. And they often don't have a long follow-up. The problem with some of the data from Alan's study from 2005 was, we were at that time using more blood than we are now. The guidelines at that point in 2005 were less evidence-based as they are now, and I think that's why now, without much much effort, many of the

hospitals should have seen improvement in blood utilization, at least in the 20% range, just because widespread dissemination of evidence-based guidelines. I would say actually that *the most important benefit of the education initiatives is really relationship building*. You're going out there and you're showing yourself as a resource, whether it's to the house staff or to the attendings, about the latest and greatest that's going on in terms of how to use blood more wisely. Whether it's pointing them to the literature around fixing anemia, or whether explaining to them about the use of antifibrinolytics, whether it's about using tourniquets for some of the orthopedic procedures. Really, I think of it as just an excuse around relationship-building, which is not captured certainly in these educational initiatives. So I think that's the real benefit that's not captured in any of these studies is that part.

Joe: I think that's really important to understand that, and I especially like your point about how in previous decades, maybe it was an easier target, because the guidelines weren't necessarily as evidence based. So I wanted to mention to everyone listening, there are a couple of previous episodes that I've done, if you're wondering about some of those guidelines that Mark mentioned that are evidence-based. Episode 23 of this podcast was a discussion with Dr. Jeff Carson regarding the AABB recommendations for red cell transfusions [NOTE: www.bbguy.org/023] , and episode 35 was the discussion with Dr. Rick Kaufman about platelet transfusion guidelines {NOTE: www.bbguy.org/035]. So again, all of those resources, as well as the articles that Mark mentioned, will be linked on the show page for this particular episode of the podcast. So Mark, forgive me for interrupting there, but I wanted to make sure everyone was aware of those resources. OK, so education is a great part of what we do. And education is important, though, as you mentioned, the long-lasting aspects of education are a little bit more difficult to evaluate. From my perspective, anyway; You agree with that? It's a little hard to see how this...you do it now and I don't know what happens two years from now. That's kind of the question with education, right?

Mark: It is. Part of it is the housestaff that you train, they turn over. So there is always new housestaff, so by definition, internal medicine, they turn over every three years. And so you get someone up to speed just in time for them to graduate. The best advice I've ever heard whenever I talk to my ICU docs about education is the statement which was the following: *"You can educate us as much as you want, but you should try to make it so that it's impossible for us to do it the wrong way, but make it easier for us to do it the right way without having to think about it."*

Joe: [19:14] And that actually leads us really nicely into our second practical tip. So our first practical tip was to implement education. The ***second practical tip*** is a really, really practical, rubber-meets-the-road, you can implement this very quickly-type tip, and that ***is to evaluate your critical laboratory values***. That just seems so obvious. But I think that's a super-important, and like I said, easy to implement

tip. So Mark, for those listening that aren't sure what that even means, just take us real quickly through what do you mean when you say "critical laboratory values," and how do we evaluate them?

Mark: Sure absolutely. So, a critical laboratory value is usually a critically low number, for instance, a low hemoglobin or low hematocrit, or low platelet count that would trigger a call from the lab or the lab's customer service to the ordering provider or nurse and say, "You have a critical lab value." It's a value that is low enough that it warrants at least contacting or review of the patient's condition to and make sure that they're not on the verge of a life-threatening event, is what a critical lab value uses is defined as. So, if you have your critical lab values defined too high...and so one of the things I noticed when I first came here many years ago was at that time, our critical lab value for hemoglobin was 8 or hematocrit of 24%, and our order sets at the time said, indication is if your hemoglobin's less than 8 or 24 percent hematocrit, you should transfuse! So, you can imagine nowadays with such a high number, if the physician's called to say, "You have a critical value of 8!", you're feeling compelled to transfuse. Well it turns out if you look at some of the data that's available, I think the CAP in one of their Archives of Pathology and Lab Medicine has a reference around critical lab values, you will see around the country, what's the percentile breakdown. It turns out at that time an 8 hemoglobin was I think at 90th percentile, meaning by using an 8 hemoglobin as a cutoff, I had a higher cutoff than 90% of the reporting labs, which was I think in the thousands that might have been reporting in that study. So that's how I then made the justification to drop it to less than 7, which was right at the median 50th percentile. That alone took pressure off the physicians to be able to not be prompted to order, because when you get phone call telling you, "it's a critical value," of course he wants to transfuse. So, that's a very easy win. So definitely, look at your critical lab values, make sure you don't have a particularly high hemoglobin level. If you feel comfortable, you know, it's been a while since I've looked at it, but the question is could you drop it a hair lower to even 6, depending on the population you're working with? These are always vetted by and approved by the medical staff of the hospital. How critical values are set up. But that's the way I would do it. Talk to the transfusion committee, see if it's too high, and bring it down.

Joe: Yeah that's such a great point! I love what you just said, because I think a lot of times people miss that, that setting critical values is hospital-specific. You work that out with your with your clinical staff, not just hemoglobin and hematocrit numbers, but platelet count numbers, INRs for example, things that the docs are getting called about that would almost force them to act. Make sure that they make sense based on your transfusion values, right.

Mark: Yep.

Joe: [22:45] Okay. So I love that tip! Like you said, easy win! So that's a really cool one. Let us move on and do ***number three which is to use benchmarking***. All right, so that's a big, well, I don't it's not really that big a *word*, but it may not be obvious what we're talking about when we say "benchmarking." So Mark when we talk about doing that, and comparing ourselves to other facilities, what are the tools that are out there to do that?

Mark: So "benchmarking," for those who are not familiar with the term, it really is to look at how you are using blood within your hospital and comparing it to other institutions. The one that we used in the past was just number of transfusion orders where the hematocrit was greater than...I think was higher than 8, I'm sorry, HEMOGLOBIN, where the hemoglobin was higher than 8. Meaning, we expect a certain percentage of our patients to have a transfusion higher than a hemoglobin of 8. And then, compare yourself against the other folks around the country, and ask, "Well, how am I doing?" Other folks might ask, well how about by surgery procedure, you know, how much blood am I using per CPT code, for instance? So, there are ways to look at that, and then ask again, "Why is my blood usage high?" And then, the beauty of benchmarking, if it is done right, you could participate with groups that are studying it with you. You could perhaps then ask them those who are doing well, and to ask, "Well, what is it that they are doing?", these high performers, as to, what were the keys to success? Simultaneously understanding from the low performers, the ones who are using a lot of blood, what was the cause for their challenges? Benchmarking only works, however, if you believe that the institutions you are comparing yourself to are similar to yourself. It can be difficult, it depends on...I mean in this day and age, with electronica, with the EHR, you would think it'd be easy, but it's not always easy because of the way people count number of units that are used. So there is some work to do the benchmarking, but that is what people have done in the past.

Joe: Well, again, if we're going to keep this as practical as we can, if someone was just starting out, whether we're talking about someone on the bench level, or pathologists running a blood bank at a hospital, or another provider running a blood bank, or a clinician, where would they start looking for that data? Is there enough in the published literature to do that, or do you need something more specialized?

Mark: It's difficult. I mean, the easiest one I think would be if I had to build it from scratch. So I'm pretty lucky. We were able to participate with the UHC or the Vizient consortium, so we were able to get our hands on some data, and to use that data as a basis to see how we did compared to other institutions. So certainly being part of a large consortium helps. But even in the absence of that, you can ask the question just as a baseline to do the following, which is to ask, take your favorite transfusion criteria, whether it's transfusions for hemoglobin less than 7, and ask questions. Like I just said, well, just to be generous, because there might be a fair number of people also might be transfuse very close to 7, so let's use hemoglobin

of 8 and asking, “What percentage of patients are being transfused at hemoglobin of 8?” And then subdivide that and ask the question, "Is there a greater percentage associated with certain services and associated with certain providers?" And just even and internally use that benchmarking tool to just at least facilitate the conversation and ask why is there a difference? Is it because the patients are inherently sicker on one provider's service than another? Invariably, that isn't the case. So you could do the benchmarking even within an institution just amongst providers, just to try and get some insight as to why are they using blood above evidence-based guidelines at this point. And I always tell folks that look, the guidelines are such that they're “guidelines," they're not necessarily rules; they are certainly not "laws" like laws of physics. So you know if your patient doesn't exactly meet the scenario, there's something unique, think of it as an opportunity to just put in more time documenting why you're not abiding by the particular recommendations for your patients, and that's fine. So I don't expect all patients to completely read and follow a written guideline! [LAUGHS]

Joe: Sure, sure. [LAUGHS]

Mark: But I think it's the basis for starting that conversation. So benchmarking even in the absence of working with other hospitals, you could do it within the organization.

Joe: [28:00] That's great. I love that focus: You don't have to necessarily compare yourself to national data. You can get good information from looking at your own data in your own place. That's awesome! So Mark, we have done the first three of our practical tips which are: **One, implement educational efforts; two, evaluate critical lab values; and three, use benchmarking**. Love those! So let us move on to ***tip number four*** which is really, really crucial (and I think it's a lot of what people think of when they think of "patient blood management," though it's only one part of the strategy), and that is to ***start auditing***, to start looking at your practices. So auditing practices let's talk through that. What are the options? When we say "auditing," what can we do?

Mark: Auditing is interesting, because benchmarking, you can kind of do electronically. You gather the data. There isn't a name associated with a provider, unless you choose to look for it individually. In fact a lot of times the way benchmarking is done, you might keep the other providers names out. Education, we're not even looking at the data. So auditing is where really now the rubber hits the road, and you're looking! And there are a number of ways of doing auditing. Probably classically, what a lot of people imagine is, they look at all the past transfusions, they go back in the charts, and they ask, "Which ones of these met indications or not?" That's what we call "**retrospective**." There is another one, what I would call "**near or immediate retrospective**," which is, you JUST completed the transfusion and now you look up the numbers and say, "You know, it doesn't look

like it really makes sense, Could you tell me more?" And then the third approach is "**prospective**" auditing, which is you basically head off every order and ask if it is appropriate or not, and if it's a problem, you don't let the transfusion go until you sort of figure out with the provider whether it made sense or not.

So those are the three, with all their pros and cons. I'll start with the first one I've talked about which is the classic retrospective. It's already done. There's no pressure. You can gather all the data, take your time and review it. But the impact is low to some degree, because it is already done. The provider might or might not remember all the circumstances. They'd have to go back and pull up the records; they've moved on. The immediate retrospective, I think, is a really neat idea, because it's still fresh; the learning cycle's probably more robust. But again, it's already done but at least it's right then and there. You kind of have to catch it maybe the next day. Not a bad way to do it. There are some pros, I think, for the immediate retrospective. Prospective is most interesting because that's where you potentially could be challenging the provider about what's going on, and your impact potentially is highest there. I think for some pathologists or other providers, challenging another doctor about whether or not this is appropriate can be challenging, whereas the immediate retrospective, I think, is the blend of the two worlds, to say, "Well I'm not challenging them, but I want to understand what happened." You're not going to change what they've done. So I think those are the ways to do it. It's pretty manual, requires somebody looking at the labs. We certainly have a system here where the minute a transfusion order is generated in the blood bank, it pulls up from the computer system their latest lab values, and we can look right then and there and see if it meets criteria or not. And then it's up to us whether we choose to make it prospective or immediate retrospective. So right now, in our blood bank, we are a combination of both. We are immediate retrospective...I take it back, we are prospective for platelet transfusions of two doses or more in the same day, and for utilization otherwise we go more classic retrospective analysis where we gather all the data.

Joe: Well, I think you make a really important point about the potential for impact with prospective audits as well as the potential for conflict [LAUGHS]. My residency program, I trained at Walter Reed Army Medical Center a very long time ago, and everything was prospective there, screened by the blood bank staff with the residents called if there was something out of the ordinary. I remember my first night on call calling a surgeon about, well we didn't have INRs back then, but a PT was not too terribly far out and they were asking for a bunch of FFP. And I have to tell you, Mark, it was terrifying, really frightening, and it didn't go well! Let's just put it that way. So I hear what you're saying, it can make the most difference. But man, you can have a lot of conflict around prospective audits.

Mark: I mean, I know of other facilities that will do the immediate retrospective. It's a question of just having folks on hand to do it on sort of a more consistent basis. I

personally think you can do the immediate retrospective, that makes a lot of sense. But you know even with the prospective, the way I do it is, when I'm aware of it...so the capacity always exists for my staff, so if they see something that's untoward, they can weigh in. There are a couple of really neat papers out there, I think there's one by my colleagues in Toronto, so shout out to the folks in Toronto, I think Sunnybrook might be one of them, or might be the entire system, where they actually have their blood bank staff provide prospective auditing. So what they'll do is, if they see that the transfusion does not meet transfusion guidelines, they will kick it back to the nurse and say, "It doesn't meet," and that it would need to be escalated to the attending level, if they still want the transfusion to continue. So talk about putting people on the hot seat! So they have done that, and I think successfully.

I mean the way I do it is, I always remind my colleagues, I say, "Look, it's not meant as an attack on your competence as a physician, and think of this as I am just pointing out that it is not obvious to someone in your own house who has informed the indications for transfusion. If you believe that it is indicated, but not fully captured just based solely on their hematocrit or hemoglobin or platelet count, then I am recommending that if you feel this way, do proceed, but make sure to better document why this is not in accordance with the guidelines." Meaning, patient historically is known to be really difficult on the OR. So we have instances of patients who have redo cardiac surgery and we know with the repeat cardiac surgeries, there's just so much scar tissue! There is anticipation that is more blood loss. A patient with a bleeding history, obviously, or a family history of bleeding, and was known from a previous procedure to bleed, you want to be much more aggressive in terms of transfusion support. So I think there are reasons for why you want to transfuse a patient above guidelines, and you just have to just then be explicit about stating it. You'd rather sort of say up front, "I know it didn't meet guidelines, but here are my reasons why, and that's why we're transfusing the patient. I've spoken to the patient about it, it's documented," so that the patient has a complication, a transfusion reaction, at least you're can't be called to the mat and say, "Whoa! Didn't you know about these guidelines and why didn't you follow them?"

Joe: For those of you that are clinicians that are listening to this episode, what Dr. Fung just said is so critical, and I'm going to restate it in not nearly as eloquent a way as he did, but I completely agree with what Mark just said. Really, "Tell us why." That's really the biggest thing. "What's your thought process?" Document what your thought process is, and that's really what we're looking for. And Mark, when I when I said what I said about prospective audits can be frightening, I was saying that from the perspective of any of a really junior resident that was terrified. But I agree with you. I think that doing it that way has the potential for impact. And I agree that what I think it was that was Yulia Lin's paper that you were referring to, right, in Transfusion in 2016? Yes. So I'll put that in the references. Well there's a lot of

ways to do this and, but the point is to do it get even if even if you get started using even if you get started with something that that ultimately is is bumped up and improved, it's really important to take a look at this and to use your auditing tools. So Mark, anything else on auditing before we move on?

Mark: No, it's again it's an opportunity to build relationships.

Joe: [37:12] Yep yep, love it! OK, so that is tip number four. ***Tip number five*** is one that I think we need to spend a little bit of time on, because I think this is easy for smaller facilities to say, "Well, I can't do THAT, because I can't get real complicated," and that is to ***change ordering practices using electronic tools***, including electronic ordering and things like that. So talk us through a little bit about that, Mark. What can we do with the way things are being ordered, the way blood is being ordered nowadays, that can help us with transfusion practice?

Mark: Absolutely. So with the onset of electronic ordering, there is a lot of potential. And I would just highlight two basic ways you can impact ordering practices with the electronic ordering, One is to, and this is sort of the "pie in the sky" for some folks, but the idea is that when a doctor puts in an order for their patient, that the system behind the scenes would then immediately pull up and ask, "Well, was the patient's hemoglobin really less than 7? Was the platelet count less than 10, or less than 50 depending on the indication?" And then have an alert pop up to say, "Whoa! Alert! Your patient doesn't meet criteria. Do you really want to move forward on this?" And that's actually the fancy approach. The alternative approach is just putting into the orders embedded in the indications. So that you actually say, "I am transfusing for hematocrit of less than 21 or hemoglobin less than 7. I am transfusing for platelet count of less than 10,000, or I'm transfusing for a bleeding patient with a platelet count of less than 50,000." Just embed it in. No fancy tools needed, other than just formatting the text so that you're, as I said earlier, helping your clinical colleagues know how to do the right thing without having to remember that lovely lecture you gave to them a year ago. You can certainly, and I've done this in the past, I used to embed links with, "Here is the article and here are the indications." Well, they don't always click on the link, but if it's part of the order itself, when you click on your choices you want to order, that makes it a lot easier. And it avoids that sort of "alert fatigue" that might pop up with the electronic systems, where you do the logic, which is nice but that's a big ask sometimes. There are facilities who've been able to put in those really fancy order sets that way.

Oh yeah, and you can do something as simple as, I can't remember which one of the papers, but you can do something as simple as and I'll use my own blood bank as an example. Don't put down that they have a choice of up to four units of platelets or four doses of platelets if you never intend to give them four doses! Limit it to two or even one. So there are folks who have order sets that only allow for

ordering of one dose of platelets. It never allows for you to order two. So there are ways without any magic other that just limit what they can order.

Joe: [40:10] I love it. OK, so Mark let's go to the **last practical tip**, because I want to get to that because I know it's one of your favorites. But I also want to swing back around and hear what strategies that you found most useful, and your results. So just for review, everyone:

1. *Implement educational efforts*
2. *Evaluate your critical lab values*
3. *Use benchmarking*
4. *Start auditing*
5. *Use electronic tools such as electronic ordering to influence practice*

And ***tip number 6 is to utilize peer feedback***, and we've kind of danced around this a little bit, Mark, so the stage is yours, the platform is yours. Talk a little bit about how you feel about talking to folks about transfusion.

Mark: Well you know I'd like to believe that most of us who went into medicine did so because we felt like we were able to talk to other human beings! And so, those of us in pathology might be looking at glass slides all day long. This is a good excuse to talk to your colleagues when you're covering the blood bank, You can go upstairs and say "Hi," and they might say, "Why are you up here? Are you here to collect a body?" "NO! We work with the living!" And so, it is really about relationship building. There are a few ways. I think many of us do this. One is just, some people will just call out of concern. Again, the peer feedback, you know, the relationship is really, it can be just like we were talking about with the auditing, it could be retrospective, it could be immediate retrospective, or it could be prospective. It is certainly more effective for, I think, a physician to do than having the blood bank staff do it. I think it's one thing to have the blood bank staff do the auditing and the screening, but when it comes to having a conversation, I think that's important. The downside, of course, is when you do it yourself, one-on-one, you don't have that sort of empowerment or multiplier effect when you have blood bank staff do it. And I think that's why some people have gone to having Transfusion Safety Officers to try to help as, it's almost like a physician extender to help with that process.

I mean, certainly in the past, and other people have published in the literature, you know, you can come up with a template email where you just, whenever a certain transfusion comes across your desk, so it doesn't have to be very hard, where you get your name out there to say, "Hey, saw your transfusion today for Joe Schmoe, medical record this, hematocrit this. Just trying to find out what was the reason for that?" And I can say, even when I do my committees, when I used to chair the transfusion utilization committee, where we have utilization reviews where some of the other committee members would have weighed in on a transfusion that didn't seem to make sense, I never say that it's *wrong*. What I'll say in my feedback to the

ordering providers will say, "We had the transfusion evaluation done on this because it was flagged, because it was outside normal criteria. We've had one or two of your peers on the committee review, and it was not immediately obvious from review the indications. We hope you can provide us with additional insight as to the rationale and the thinking at that time." No judgment now with regard to that transfusion. So I think you know that's part of it.

Probably the other piece in terms of relationship building, I certainly recommend, because we talking about how to be practical about this, I always recommend that when you are new to a facility, you are well served to reach out to the chair of surgery, anesthesia, and medicine, and potentially their QA chair as well, the MD quality person. Get to know them or the division chiefs. Better to come in and say, "Hi, I'm new to the facility. I'm covering for the blood bank at times as either as the director or the associate, and just want to make sure there aren't any things you might want changed. Curious as to know how your experience has been here?" Develop that relationship, so that way, your relationship with them is a positive one to start, one of open door, and then so when there are bad things going on, that's not the first time you get to talk to the chair of surgery and anesthesia. So I think that that's really important to do that, so that you can then have influence. Almost always I get the comments from the chair of surgery and anesthesia and medicine is like, "Oh, please let me know if there's ever any any problems or challenge you have," because you've started the conversation the right way. So I highly recommend that in terms of relationship building, wherever you're at.

Joe: [45:00] Really important. Mark, one question, because I get this a lot from from people that are overseeing blood banks that are pathologists, for example, who are primarily doing anatomic pathology all day, or in other cases people that are overseeing blood bank that are not even pathologists, in any case they're not transfusion medicine specialists. What I hear a lot from people is, "Well, I don't really know how much I can do, because I'm not a blood banker!" How do you feel about that? Can they still make an impact if they're not transfusion medicine certified?

Mark: You know, I always say the following: So what's the difference? We're talking most of us probably put in three to four months of blood bank rotations during residency. So it's the difference of a year's time of fellowship. I would like to believe that over the course of even my community practice providers, they will accumulate just as much experience as any fellow would in a year's time. So certainly someone who is boarded in transfusion medicine has that one year advantage. But they certainly will not have the relationships that are inherent with some of my community providers, in terms of working with them on frozen sections, and on other issues. So that's one thing that people sometimes don't realize. So I oversee a fair number of community practice providers in pathology here. We've actually formed a group of community practice pathologists, and I love them dearly,

because they are out there representing the cutting edge of care in these facilities. And they actually get to see their physicians on multiple fronts, whether it's on the chemistry side, the micro side, the surgical pathology side, and the blood banking side. So, often they bring tremendous value by having this sort of multimodal for their patients, being able to weigh in, more than what I do here in blood bank alone. So if anything, they have their relationship there. I don't think they should be shy. The AABB, the CAP, and other organizations, I think, have done as much as they can through educational materials and guidelines that help give all the talking points that our blood bank staff needs, whether they are blood bank board-certified or not. They know more than they might give themselves credit.

Joe: That's awesome! And I guess I would kind of close that with letting the clinicians that are listening to this episode know as well that, look, you have a resource in your blood bank. You've got, whether there's a transfusion medicine specialist there or not, you have folks overseeing your blood bank that can really help you, so don't hesitate to talk to us. We are happy to help you guys, so that's my little commercial, Mark, that I wanted to make sure we got out there. Anything else that you want to talk about with peer feedback, before we get back to your experience at Vermont?

Mark: Well I think the only thing around that is even if a single provider in a lab is feeling a little uncomfortable, they should remind themselves that the community, the transfusion medicine community, is a very generous one in terms of being willing to share and hear about other other situations and to provide feedback and guidance. So people should just reach out to other facilities for directions.

Joe: [48:29] For sure, for sure. All right, well we have kept our listeners in suspense long enough, Mark! So you, over the last 13 years or so at Vermont, have made some impact on the transfusion practice there. I'm not going to say that you've "changed it," but you have certainly made an impact (and I know you're a little sensitive about that phrase, so I'll be careful with it). But I'm really curious to know, and I know our audience wants to know: What has been your experience in your time at Vermont, and what has happened over the years?

Mark: Well you know, like a lot of facilities, we've been slowly dropping our blood use. A lot of what I talked about, we've actually done here. When I first got here, first thing I did when I arrived was, I asked the question, “What was our critical value?” I pulled up the Q-Probes data from the College of American Pathologists, I can't remember what year the Archives of Pathology and Lab Medicine article was for critical lab values, but I got that data. Fixed the critical values. Beforehand, I also did a quick benchmarking. I did do, back in the day when the computer systems weren't as robust, I just sat there with three months worth of data, just crunched through it, and asked what was the utilization, and then compare that to the what was then called “UHC,” but now the "Vizient database." At that time, just to share

for folks, I don't think it's published, but I feel comfortable just sharing, at the time looking at the UHC benchmarking project in 2002, one of the benchmarks they used...well, it wasn't "benchmark" as much as it was just an observation, that of patients with pretransfusion hemoglobins above 8, where there was a transfusion order for medical cases, of 52 institutions, 30% of the transfusion orders of the medical cases were for orders with pretransfusion hemoglobins above 8. So when I looked at that data and then compared it to my institution, we clocked in at about 50%, so 50% of the blood was hemoglobins above 8. Now keep in mind, at that time, our critical value was a hemoglobin of 8! That kinda makes sense.

Joe: That's does make sense!

Mark: It's hard to believe, but when I looked at the data, I said, "Huh! Who knew?"

Joe: [LAUGHS]

Mark: So, we went ahead and fixed it, and as I mentioned earlier, went and fixed the critical values, changed to 7, so we went from 90th percentile to 50th percentile with hemoglobin of 7. Went to my order set, and my order set at the time said you know transfuse for hematocrit of less than than 24%; changed that to 21%. So you know, just doing that, and then doing the "dog and pony show," going around telling everyone about transfusion triggers, giving talks about that, lots of presentations. And when we did that, we were able to get within the first year I think a 15% reduction in blood use, while at that time actually it was increasing, this is back probably like in the 2004-2005, it was actually 6 percent. So while everyone else was going up, we were finally going down. So some people might know my neighbor in Maine, Irwin Gross, who at that time established a very, very aggressive blood utilization, blood management program, and was able to drive down, I think on the order of 30 to 40% drop in blood use. Now, I didn't know where he started from, but that was a tremendous improvement in blood use. So, it can be done. So those are the things we did. The education, I think, was more for relationship building. Sure, it made people more aware of what's going on, but I think at the end the day, just what I called “very easy hardwire fixes.” That's what my ICU docs asked: "Make it easy for me to do the right thing." Change the order sets, change the critical lab values, and I think that took care of a lot. So by time we were done with all those changes we...You know, so when we started, we were transfusing approximately 12,000 units of reds a year, 2000 apheresis platelets per year, and by this year we're down to around 8000 of reds and 1500 of platelets. So it's pretty decent savings.

Joe: Yeah. OK so you've dropped the number of units that you've transfused. Do you have any information on outcomes? Is that a fair question to ask you, or can you speak to that?

Mark: What's interesting is, it's not about decreasing...I mean, I would say it's always about right blood to the right patient at the right time. So we know that the data does answer the following question: If you took patients, then you randomize them in some scenarios, those that got blood did do worse. So we know the data is there. But if the question is when I use less blood, did I improve outcomes? That's a different question! The question that should be asked retrospectively is, of the same types of cases that were evidence-based in the original randomized controlled trials, if you look at the data retrospectively, can you show in a before and after (because you would have changed the way you've done it), did outcomes improve? Hard to know. I would think the answer should be yes. Some people would say, "Why would I want to do that? I've already shown it with randomized controlled trials." But I think that's the real question to ask. It should not be tied to "decreasing blood usage equals better outcomes," because for all you know, you have an aging population requiring more blood than ever. So your per diagnosis blood use should have dropped, but you might have more diagnoses requiring blood. What are your thoughts on that?

Joe: I completely agree! I think that's really the only thing we can do. I want to make sure that we're not left with the idea that, "Yay, we've decreased all this! And so we're happy," but, of course we're happy, we think that you're getting the patient the right product and that we're avoiding the unnecessary stuff. But I think that you just answered the question really well in terms of what our focus should be, and how hard it would be to compare apples to apples, to people that got transfused under previous thought processes, versus people that are getting transfused now. I think that's almost impossible to know.

Mark: Well, I think the other thing to keep in mind is as we moved from an era where we think blood use was excessive to blood use that is more appropriate, we will slowly dip into occasions where blood was not given but should've been given. There is some hemovigilance data either by the French or the British to suggest that we are now seeing instances of *underutilization*. And I'll give an anecdotal story to highlight the dangers of saying, "Decreased blood use equals better outcomes." We had a case of a patient coming in, trauma, and I heard that they were needing to use AB plasma. So awhile pass and then I called upstairs, no, I called blood bank, I said, "Did they take any AB plasma in the end?" They said, "No." And I thought, "Oh good, we made the plasma available and they didn't need it. Great!" I call upstairs and they said, "No, plasma came up late, patient was dead or dying, so we didn't use it." So, obviously, we went back based on that and said, "We need to revisit how we make plasma available," and it was the beginning of the genesis of the use of prethawed plasma. And now many of us use blood group A plasma, we still titer our blood group A plasma so that when you use it in these sort of emergent situations, we know a given group A plasma that's low in anti-B. But the idea is that, you know, that was an instance where actually you if you didn't interpret it properly, you would have said, "Oh, great! We didn't use much plasma!" Except the patient

died! I always remind folks in the blood bank, I say, "Look, donors donate this blood with the intention of it to be used for people in their community. It's our job just to make sure it's used wisely, is all we're supposed to do. It's not like we earn interest holding onto and not using it."

Joe: Mark, you have given us so many really, really great tips, and I think that the way that you look at this is really, really practical and really, really helpful. So I know this is going to help my audience enormously. Thank you very much for being with me on the podcast!

Mark: Thank you. You've always been wonderful in terms of helping all of us learn more about blood banking, even me, so this is a wonderful resource. Thank you.

Joe: Hi, everyone, it's Joe with just a couple of quick thoughts to close. I won't say a whole lot because we are bumping up against the hour, but I will say that Mark is not just someone that *talks* about this stuff in theory, he actually puts it into practice! I hope that you have heard things that you can use and put into practice yourself in your own environment. I really would love to hear your thoughts, either way, so please go to BBGuy.org/043; give a comment. I will look at every single one of those, and respond to the vast majority of them (but I certainly see all of them). You can also get the transcript of this episode and many of the references that Mark and I discussed today.

My thanks to Dr. Mark Fung for appearing on the podcast, and to each of you for listening and commenting! 2017 has been a blast, and I can't wait to bring you more Essentials in 2018!

So, that's it for today! Thanks again, and as we close (as we close this episode and this year), I hope that as you go through your day today, that you will smile, and have fun, and above all, never EVER stop learning! Thanks a lot! We'll catch you next time on the podcast.