



## **BBGuy Essentials 042: Do Clinicians Know Transfusion Medicine? with Rich Haspel**

**Joe Chaffin:** This is the Blood Bank Guy Essentials Podcast, episode 042.

[INTRO MUSIC]

**Joe:** Hi everyone. Welcome! I'm very glad you're here. My name is Joe Chaffin, and I am your host. You know, I think most of us who practice transfusion medicine on a day-to-day basis would say there are some times when we have a little bit of, let's just say, "concern" about the level of transfusion medicine knowledge in some of our clinicians that we work with. We have moments where we say "Wow!", or, "Seriously?". And, of course there are many, many, many exceptions; I don't want to paint all clinicians with a broad brush, and clinicians, don't think I'm beating on you, because I'm not. But today's guest is someone who has led a detailed quest to actually *measure* how well clinicians know transfusion medicine. I think this is really important for us to know and understand, both as transfusion medicine practitioners, people that work in laboratories, pathologists, as well as clinicians. I think it's important to understand where strengths and weaknesses are. My guest is Dr. Rich Haspel from Beth Israel Deaconess Medical Center and Harvard University, and he's here to share what he and his colleagues in the BEST collaborative have discovered by implementing a validated survey and exam. And clinicians, again, don't think we're beating on you today! We're going to discuss tools that can help you as a clinician assess where you are with your understanding. And really for all of us to help understand again where we're strong, where we're weak, just makes us all better in the end. So I'm very excited to share this with you.

I should let you know before we start: This is not a continuing education episode. You can check [BBGuy.org](http://BBGuy.org) and [TransfusionNews.com](http://TransfusionNews.com) for episodes that end with the two letters "CE" to get free continuing education credits, both continuing medical education, as well as P.A.C.E. accreditation and Florida credits for laboratorians. Those CE episodes are provided by Transfusion News, with generous sponsorship from Bio-Rad.

All right, so I won't make you wait even one more second! Here is my interview with Dr. Rich Haspel.

**Joe:** Hey Rich! Welcome to the Blood Bank Guy Essentials Podcast!

**Rich Haspel:** Hi! How are you doing?

**Joe:** I am doing really, really well. I'm so honored that you would join me today because I think that you and the team at the BEST Collaborative are doing some

really, really interesting work that's near and dear to my heart as an educator, and I can't wait to talk to you about it. I wanted to start, Rich, with just a little bit about your background. As you know, a lot of the people that listen to my podcast are just kind of starting off in the field, and I'm curious about you and how you got interested in transfusion medicine and kind of how you moved along this pathway in your career?

**Rich:** [00:02:56] Well, first, thanks for the opportunity to talk on this podcast. I always appreciate the opportunity to talk about medical education because when I started I did an MD/PhD at Cornell and Rockefeller. I worked on transcription factors, and I actually never even heard of clinical pathology when I was in medical school. I basically didn't even know what anatomic pathology was, I thought I was just dealing with dead people! And so I actually applied in internal medicine with the idea that I'd mainly do basic research with internal medicine, go into some medicine specialty. So I started my internal medicine residency, and I did enjoy working with patients, but I wasn't sure it was a perfect fit for me. So, after my internship year, I took a year off, and I was actually deciding, "Well, will I do straight research? Should I go back to medicine?" And I was doing some research at the time, and I actually was playing squash with a friend of mine and he said, "Have you heard of clinical pathology?" I was like, "No, what's clinical pathology?" When I was in medicine I was always interested in, "Well, what's the difference between lipase and amylase? So, why DO we irradiate products?" And clearly, with my research background, I was always interested in the lab. So I started, where I did my residency, I started going to CP meetings, and I was like, "Wow, this is the perfect thing for me!" And especially transfusion, because I like the patient interactions, but I could more focus on the laboratory aspects of medicine. So I ended up doing a clinical pathology residency, and again for the reasons I said, I decided to do a fellowship in transfusion. So one of the lessons I learned is when you're applying for residency, you think that's the last choice in your life, and that's what you're gonna end up doing, and my life story just proves...I didn't even know what I ended up DOING in medical school...

**Joe:** Especially when you'd never even HEARD of clinical pathology! That part cracks me up!

**Rich:** Exactly. And that's why also, when I started my first job here at Beth Israel, I helped run our stem cell laboratory. So I thought I was going to mainly do translational research and stem cell biology, because I also spent some time during my residency working in a basic science lab in stem cells. But I had always liked teaching, and mainly because of my medical school experience, I kind of had a mission to try to teach people that there IS something called "clinical pathology," and how important laboratory medicine is. So I had started something when I was a resident to sort of introduce medical students to clinical pathology at some of their morning reports for medical students, and they were starting a new curriculum at

Beth Israel for the third year medical students. And I just went to the director and I said, "Can I introduce some pathology?", and he said, "Sure!" So we started developing a curriculum around that, which we ended up publishing. But I got to know this guy, and he said, "You know, we have a fellowship here in medical education. It seems like it's something you might be interested in." So there's something called the "Rabkin Fellowship" at Beth Israel, although people from throughout Harvard can go. So I did a year of training, a fellowship in medical education. And I really learned that it's one thing to say you love to teach, but just like any other area of medicine...you want to find the best drugs you use for cancer, and there are ways to study the best ways to teach and best practices. So it's another story where I had no idea I'd end up being very involved in medical education, but it's just where things lead you. I ended up being residency director, and now I'm the director of medical education, and my area of scholarship is medical education and doing research projects. And I think because I have a PhD background, one of my ideas is to try to apply more quantitative methods to education, and that's where this study, with using an exam, and designing an exam, and using statistics, kind of fit with my interest.

**Joe:** [00:07:34] You're right, that does completely dovetail into what we're going to talk about today. So let's get to it, Rich. Let's start first with maybe just a little bit of a background, again because not everyone listening to this podcast is going to be familiar with the work that you guys have done, let's just kind of lay the background for it. So let me ask you this simple question: Do we have evidence (and I'm talking prior to the development of the assessment tool that you guys did), but is there evidence in the literature, not just anecdotal from blood bankers saying this, is there evidence that there IS an issue, that there is a problem perhaps with clinicians' knowledge of transfusion medicine?

**Rich:** Yeah, I think there's definitely a bunch of studies showing things when they've reviewed plasma use, or platelet use, or even red cell use where they go and look at orders. They do either retrospective or prospective evaluation, and they realize that people are ordering blood products not using evidence-based practice. So, there was a study of plasma that was published in *Transfusion* in 2015 that people are not transfusing for appropriate reasons. There was a paper out of the U.K. where about 34% of prophylactic transfusions were inappropriate, for example. Another study on red blood cell use found 23% of transfusions were considered inappropriate, other paper in *Transfusion*. So there's definitely evidence that clinicians are misordering products. So, taking a step back a little, you could imagine they haven't LEARNED how to appropriately order them. And there was a study published in *Transfusion*, I believe it was Karp who published [NOTE: [Karp JK et al. Transfusion medicine in American undergraduate medical education. Transfusion 2011;51:2470-2479](#)], that looked at medical student teaching and it basically showed that medical students aren't learning...there's very little time spent on transfusion. It's kind of crazy, when transfusion is really the most common

procedure in the United States, for example. Yet we teach nothing about it. They know more about *hereditary spherocytosis* than they know about transfusion, which is kind of imbalanced. So, yes, there was that starting point. I think most transfusion specialists recognized there was some sort of problem out there.

**Joe:** Right. And I think...I can't remember where I read this, but I believe I read somewhere, and I think this is still true, that when you look at the topics that are considered essential for the licensing exams in the United States, the USMLE, that there is very little to no transfusion knowledge even REQUIRED on those exams. Is that still right, Rich?

**Rich:** You know, I'm not sure. I haven't looked at, for example, the USMLE licensing requirements recently, but there's no question, when we have medical students rotating or we have residents come in, I'm like, "How much did you learn about transfusion in medical school?", and they say, "Nothing!" If the exam was a big driver, people would be studying it. I think there's really good evidence that there's very little, you know a lecture here or there, for something that almost all residents will be doing.

**Joe:** [00:11:13] Over the years, Rich there have been...you're more familiar with these than I am I'm sure, but there have been numerous papers published showing, we did this questionnaire and gave it to this group of clinicians, and this questionnaire and gave it to that group of clinicians, including by the way, (I just have to throw this in because it's my very favorite one) I think it was from the early 90s, and I'm sure you'll remember this. But there was one that came out that showed that on that particular survey of transfusion medicine that the residents actually did better than the attendings, but the attendings were much more SURE of their incorrect answers, which just cracks me up! It's just a hilarious thing. But...go ahead...

**Rich:** I was just going to say I was involved in a study, actually it was when I was a resident where they were tracking blood orders. And what would happen is if a resident ordered a product that didn't fit with our guidelines, I was part of the team that would meet with that resident and say, "You know, these are the guidelines. What's going on?", and they said, "Well, I was kind of aware of that, but my attending told me to order the transfusion!" But it's important still to focus on trainees, because they're are going to be obviously be the attendings of the future. But we also have a need to teach the attendings as well.

**Joe:** Yes, and I think that's what I wanted to get to before we before we get to what you guys decided to do that's a little different than some of the previous studies that have been done. I have clinicians that listen to this podcast as well, and those of you that are clinicians, please don't think that we're beating up on you! I think that, I'm going to speak for myself here, but I'd love to hear your thoughts on this as well,

Rich, my feeling is that we have been stuck at least in the United States in a kind of endless loop of people that don't get training on transfusion medicine trying to teach other people that don't have training, who teach other people who don't have training, and at some point we've got to break that cycle. And I think that what we're trying to talk about today is a way to kind of get an idea about where the problem is. Rich is that is that a fair way to put it? Am I overstating the issue?

**Rich:** No, I think, obviously, people want to, even the people misordering products, they want to do what's best for the patient. But they don't have the knowledge. I do think laboratory medicine is kind of in an interesting place. The analogy I use, if you do apheresis for example...it would be unusual for a cardiologist to tell a psychiatrist that the psychiatrist is using the wrong antidepressant. But, I don't know if you've had this experience, but with apheresis, a lot of clinicians think they know everything about it, and have no problem telling us that, "This is absolutely what needs to be done," even though the data doesn't suggest it. And I think with that, and it's not only true with that, it's in chemistry and other areas where lab medicine is something that people think they know. And, I think there's kind of different types of blood bankers. There are those who kind of sit back, and it's kind of like Burger King, and it's "Have it your way." It's a question of being proactive, and you know, not forcing things down people's throats. And I think especially with the way health care is going, I mean there's the term "Value-Added care." And I think all clinical pathologists can more communicate with our clinical colleagues, so we can provide that education.

**Joe:** [00:15:03] So, back to what I was saying before I kind of got sidetracked. I apologize. So, we have these previous studies that have been done, previous quizzes, surveys, etc. that showed that there's potentially an issue. But you and a group of collaborators from the BEST Collaborative decided to look at this in a little bit of a different way. So I'm going to just give you the floor, and help us understand what did you guys decide to do that was different than what had been done before?

**Rich:** So one of the things I learned when I did that additional training in medical education is that there is something called a "Needs Assessment," where, before you even develop a curriculum or try to figure out how to teach, you should very systematically figure out what the *need* is. How bad is the problem? What is the problem? What specific areas need to be improved? So there was that component, and then there was also, you mentioned there are a few other like exams or surveys, but what I learned is, just like laboratory tests, an exam, there are ways to validate it. And it's the same type of thing: When you have a troponin, you have to look at **precision** and **accuracy**. Is it reproducible and does it actually measure what you want? So a lot of the previous surveys and exams were not validated in any way to make sure that, is it really, truly measuring transfusion knowledge or opinion of transfusion medicine? So with that background, I had the opportunity to present to the BEST Collaborative this idea that we could really use, design, a

really good assessment tool, so we could understand how prevalent the problem is (because BEST includes members from all over the world), especially if we gave the exam, for example, to medicine residents. And then, because it's validated, we can know that it's really showing transfusion knowledge. And then, by seeing which questions people do better or worse on, that can help guide what kind of curriculum we would want to design. So we would do this exam-based needs assessment using a validated exam.

**Joe:** Okay, and for those listening, just in case you're not familiar with with what both Rich and I mentioned with the BEST Collaborative, "BEST" stands for "**B**io**m**edical **E**xcellence for **S**afer **T**ransfusion," and it's a group of incredibly accomplished people in transfusion medicine that are looking to improve education and improve knowledge. They do a ton of great stuff. You can find the website at [BESTCollaborative.org](http://BESTCollaborative.org). Sorry Rich, for that interjection. I just wanted to make sure that everyone is familiar...

**Rich:** Oh no, no, and that's fine. I think BEST is a great group. A lot of their studies have typically more focused on direct clinical application. So it was great that they were open to this idea of utilizing this pool of experts, not only a pool of experts to design a curriculum, but a pool of experts who then had contact with residents throughout the world that we could then do the needs assessment on.

**Joe:** [00:18:19] So, you had decided that you needed to do a needs assessment, you decided it needed to be validated, so why don't you take us through, Rich: What were your next steps? How did you involve the people in the BEST Collaborative in figuring out how to how to generate this tool?

**Rich:** There's a couple of types of validity. So one of them is called "**content validity**." So, is what you're going to put in your exam or your curriculum actually important content? So there are a few ways to do that. As an example, there was a statistics exam that was developed that was published in JAMA, and the way they decided what questions to include on their exam, they did a literature-based evaluation. So they looked in the literature, and they said these are the most common statistical tests that are used. Let's create our exam again seeing if the learner knows those tests. So that's a way of getting at content validity, by doing a literature-based approach. What we decided to do, because we had this whole group of experts through the BEST Collaborative international, we did an expert-based content validity approach. And so, we had a multistep level.

The first thing we did is we just asked an open question. We just kind of said, "What knowledge of skills relating to transfusion are absolutely essential for physicians?" And these are physicians who are not transfusion medicine specialists. We weren't creating a curriculum for transfusion fellows or hematologists or whatever. This was really for internists/cardiologists/surgeons. So we said, "List as many as 10 items."

So it was just an open question, so we could start getting an idea of what people would think of. And what we ended up with was about, I think we had about 289 responses, topics, but because there was a lot of overlap, we were able to whittle that down to 78 topics. So here was our core.

So once we got that core, we then sent a list of those topics back to the BEST group with the opportunity to rate them. And the rating scale was from "is absolutely not important at all to be put on a curriculum" up to "absolutely HAS to be included!" So as a rating scale, we used from 1 to 6, and there's something called the content validity index, which is basically a way of saying, "What do people agree on is highly rated?" And from that, and what we basically came up with of the a little bit over 70 topics, there were 16 that were really, like basically over 90% of people agreed that these were important topics. So that formed the starting point for our exam. And what's really interesting is you know a lot of people in the initial open question said, "Oh, they need to know serology, you know, antibody workups." But then when you ask the question directly, "Is this really crucial for a non-blood banker?", that dropped low. So, that's why this two-pronged approach was kind of useful, and then just quickly say, once we had the topics we asked BEST members to write questions for an exam.

We actually worked with the American Society of Clinical Pathology on this stage of the project, because they run the RISE exam (the resident in-service exam). So they have a lot of experience with question design. So we basically gave their rules for question design to the BEST group. And there were little things like, you don't want the answer to always be the longest choice. And people have probably seen this when they're asked to write CME questions: You don't like negative questions, you don't want to usually include "all of the above" or "none of the above." So yes, we provided rules for the members and a bunch of them then submitted questions.

**Joe:** [00:22:45] Got it. Okay. And so coming down to the nitty gritty, how many questions did you guys end up with? And, obviously we're not going to go through them one by one, but was there a particular area of emphasis in the questions or was it just broad?

**Rich:** So we asked people to pick topics from that highest rated area. And then, what we did is...I can't remember how many questions we eventually got back, but working with ASCP and a smaller group within BEST, we hit questions that were in a variety of different areas. Sometimes we covered a question more than once, but basically in the end, we ended up with a 23 question exam, which we felt was good coverage over a lot of the topics that, in the previous survey, BEST members rated highly.

**Joe:** [00:23:37] Okay so you've got your 23 question exam to start off with, and you mentioned validation. So what happens next? How do you show that those are good questions and that it's getting you the information that you want?

**Rich:** So essentially, as I mentioned, you want to look at accuracy and precision. And a good way to do that is, when you validate a test in the laboratory, if you're validating a sodium, you'll take known values of sodium that have been shown by the standard practice, the best practice method, that this is the measure of sodium and you run it and compare it with your values that you're getting with your system. So what we did is a kind of similar thing. We a priori defined different groups of practitioners, almost like you would define different levels of sodium. And those different levels were what we called like kind of "beginners," (or "basic") which were like first-year residents, internal medicine residents, or first-year pathology residents. Then we had an "expert" group which were basically transfusion medicine physicians. So the "basic" you'd expect to score really low, the transfusion you'd hope score really high, and then we had an "intermediate" group. And these were basically people who weren't transfusion medicine physicians, but were people, for example, who are members of transfusion committees. So they've had some additional interest. They were also maybe hematologists/oncologists who weren't necessarily practicing transfusion, but were expected to have some additional knowledge. So what we basically did is we a priori defined these groups, and then we gave them the exam, to see... if all the transfusion medicine specialists got like scores of 30%, and all the "basic" people got 100%, there's something wrong with the exam.

So that was the first level, and what we showed when we gave it to these different groups, basically the transfusion medicine physicians on average scored around 80%, the "intermediate" scored about 60%, and the "basic" scored 40. So we were able to show statistically using an ANOVA [*NOTE: A statistical technique designed to determine if the mean results between groups are significantly different*], we were able to show that the groups were different. So that basically was the first level. So that's what we would call "discriminant validity." So we had our content validity decided by experts, but we were able to show discriminative ability that it was able to distinguish between different levels of learning that we would have expected.

But we actually took it a step further and this is why working with the ASCP was very helpful. And I won't go into tremendous amount of details but some people might wonder, when they take a board certification exam or a licensing exam, how does that organization know that it's a decent exam? What kind of statistics are they doing? So there's actually this statistical method called "Rasch analysis," and ASCP does this for their RISE exam, so they know what questions are performing well. I'll just try to give a not-too-complicated example. So let's say you're looking at basketball, and you have two players, and they both have a 30% field goal percentage, but one has made only 30 of 100 layups, while the other's made 30 of

100 three-pointers. So they both scored "30%" on the same but the guy making the three pointers probably has more knowledge. And the shots that he's missing are probably really tough or even harder.

So as an analogy, what Rasch analysis looks at, it doesn't just look at percentages that people got right. It looks at percentages that they got right, but also at the difficulty of the question. So for example, there's someone who got 90% of the questions on the exam correct. So let's say there was one question they got wrong. So you'd want to look at that question. And, let's say the the people who scored like 20% or 10% on that exam got that question RIGHT? There's something wrong with that question.

**Joe:** Right. That doesn't match up.

**Rich:** Right. So in a kind of simple way, Rasch looks at that; it looks at who's getting what questions right. And that enables you to see what are the good questions? So that kind of gets at accuracy. Is it measuring, are the experts getting the hard questions right, and are the beginners missing those hard questions? Or the experts getting the basic questions right, but so are the beginners.

I'll just add one other thing the other thing you can get at it through the statistics is the reliability. Something like a "Cronbach's alpha," where it can say if the same person took the exam over and over, they would get the same result. So again a real analogy to lab medicine. We're measuring accuracy and precision of our exam.

And when we did Rasch analysis, it showed that it was a very good exam, but we were able to look at some questions that didn't perform as well. So we actually were able to cut the exam to 20 questions based on our analysis.

**Joe:** [00:29:33] Rich, you've gone through all of this that you had to go through to get the test, the "assessment tool" excuse me, to the place where you're ready to use it. I would love for you to fill us in on how you've tapped into the, you mentioned before, the power of the BEST Collaborative, to do your first field test with this assessment tool. So, talk us through that with what you did with internal medicine residents.

**Rich:** Yes so what we then said, "We have this exam, let's give it to a bunch of residents internationally. And that's again where the BEST Collaborative really helped. So we had members who basically arranged generally for lunch sessions with internal medicine residents at their institution, and so we can make sure it wasn't just English speaking, it was translated into German, Spanish, and Dutch, so we were able to include also non-English speakers. And we had I believe a little over 20 sites, and at each site basically again at a lunch session, the BEST member would give the exam and we collect the Scantron forms, and then to make

it useful for the residents, the BEST member would then go through the exam, so the residents could learn from it. And what we ended up through this process, we had almost 500 Internal Medicine residents internationally take the exam. I'll add one other thing that we did: We also included survey questions, so things like how important is transfusion medicine, what was your training in transfusion medicine, you know things like that. And I'll just add, just like an exam, you have to validate a survey. So we actually did Rasch analysis on the survey questions as well, to show that it was a valid survey. So we were able to collect both subjective data on what the trainee thought, but also the objective score of the exam. [NOTE: The study is here: [Haspel RL et al. Internal medicine resident knowledge of transfusion medicine: results from the BEST-TEST international education needs assessment. Transfusion 2015;55:1355–1361](#)]

**Joe:** Okay, so don't keep us in suspense! What did you guys...what did you find?

**Rich:** So, we basically found that even though basically almost 90% of the residents who took the exam had obtained informed consent for a transfusion, the mean score on the exam was about 46%.

**Joe:** Ouch!

**Rich:** And while there was a little bit of variability by PGY level, basically it ranged from 44% to 51%. So it wasn't like the senior residents were really killing it! What was also nice is they generally thought that transfusion medicine is important. So that's another part of the needs assessment to say, "Well, they would like more teaching." So the other benefit of this is we can actually look at what questions they did particularly poorly on. So what was interesting is, most of the questions that they scored less than 25% were related to transfusion reactions. So as an example, there were three questions on TRALI. The top percent, one, 9% got it correct, one, 10% got it correct, and one, 14% got it correct. On allergic reactions, only about 14% got it correct. Septic reaction, only 17%. TACO, only about 24%. While meanwhile, the questions about RBC transfusion in acute blood loss, it was 88%. Irradiation was about 82%. Procedure prophylaxis was about 80%. So the bottom line is, that was one of our goals: What are the things that we really need to target? It seems that we're getting some education on utilization, not that it couldn't improve, but what really caught our eye was, these people are giving informed consent to transfusion, and they don't even know the risks of transfusion. So it helps guide our thinking.

**Joe:** OK, Rich, so that is a little alarming. I absolutely agree. But you then later on took your tool and looked at a different group, who I would expect to just be light years better, and that's the hematology fellows, right? And I'm curious what...well, actually, first before I get to that, was that just a natural progression, you thought, "Internal medicine, OK, we've we've assessed the residents, let's just see people

that go farther, who obviously probably have an internal medicine background?" Was hematology just the next logical progression, or was there some other science behind it?

**Rich:** No, I think the idea was, this is another group who isn't necessarily doing transfusion medicine fellowships, but should know something about transfusion. So we thought it was more of a natural progression. These people are going to end up places where they're going to be asked transfusion questions. What are they learning? So yeah, it was pretty much a next step.

**Joe:** [00:34:57] OK. Well and you published...by the way. everyone, both of these references, in fact all the references that we've talked about, will be on the show page for this particular episode. But this particular paper which you guys called "BEST-TEST2," Yulia Lin was the lead author on it. And again, we're looking at hematology trainees. And it was published in 2016 in *Transfusion* [NOTE: [Lin Y et al. BEST-TEST2: Assessment of hematology trainee knowledge of transfusion medicine. \*Transfusion\* 2016;56:304–310](#)]. So Rich, again man, I'm *desperate* to hear: What did you guys find in these hematology fellows?

**Rich:** So we had almost 20 sites, again, we did an international assessment. We had I think was 149 hematology or Heme/Onc trainees, and the bottom line was that they did better than the residents. So overall the mean was 62%. So they did fall more in the "intermediate" area. Now you might wonder whether they should be more closer to the "expert" area, but at least they weren't like the internal medicine residents. What was really interesting is there was statistically significant difference between the scores of U.S. trainees and non-U.S. trainees. And the reason we chose to look at this is because we knew up front that in the United States "Heme" and "Onc" [NOTE: *Hematology and Oncology*] are coupled together, and there's a lot of focus on solid tumors, or even liquid tumors, and not so much on benign hematology. While in non-U.S., other countries, people really focus on hematology. And what's interesting, when you look at those two groups, the mean score on the exam was 56% for the U.S., while was 67% for non-U.S., and there was a correlation that people who had more training, as you might expect, did better. So that was one kind of message which was, while it makes sense, it might be a little of a wakeup call to Heme/Onc programs that, "Maybe we're not doing as much as we need to in transfusion." And even for the non-U.S. programs, well, maybe they should have *more* expertise in transfusion. And again, when you look at the list of questions that people got right or wrong, again the questions that people got wrong were again about transfusion risks. So you had people clearly consenting for transfusion, but did not know some core things about transfusion risks. So it added to that idea of how we could generate a curriculum.

**Joe:** So Rich, I'm curious with this paper in particular was there anything more that you learned? Because you did a survey with this one as well, right? Was there

anything that came out from that in terms of things that might help people score higher on the exam by maybe additional training or higher quality of sessions, things like that?

**Rich:** Yes so there was generally, I'll just say again, while people did overall better, there was again like there was one TRALI question where only 16% got it right. Only 37% got the TACO question right. So it was a little higher, but again, when you look at things like irradiation and red cell transfusion, there was again like 96% and 95% got that right. So it was the same kind of picture. And when we asked them things like, "Would you like more training?" or things like that, most trainees rated, about 81%, that additional training in transfusion would be very or extremely helpful. And 87% said it was really important for their patient care to understand transfusion medicine. So there was a recognition by the learner that they could use more training, which is good for the teacher, because it means if you create something, they'll want to learn it.

**Joe:** [00:39:19] So Rich, going back to what you talked about with the difference between the international trainees and the U.S. trainees in hematology, did you guys find any difference in the survey results on how much extra training those non-U.S. people got specifically in transfusion medicine?

**Rich:** Yes, so the trainees at non-U.S. sites overall received more training in transfusion medicine, which isn't that surprising, because again the Heme/Onc, and also that kind of also is why maybe the U.S. didn't do as well. For example 86% of trainees in non-U.S. sites reported having received three or more hours of transfusion medicine education compared to only 55% of U.S., which was very significant. The non-U.S. trainees also rated their sessions as more helpful, in fact, it was pretty dramatic. So the non-U.S. trainees rated their training and transfusion as very or extremely helpful 76% of the time while only 31% of U.S. trainees rated their training that high. So there's clearly evidence for maybe improving how we teach this stuff.

**Joe:** Yeah, teach it more and teach it better, perhaps.

**Rich:** I don't necessarily think the findings we saw were necessarily as much due to the methods, but more to the *quantity*. Related to that, if you haven't had that many sessions, you might say the quality of teaching isn't very good. That being said, I definitely believe there are better ways to teach, and just like I mentioned, I'm interested in a data-driven approach to education. There's more and more data that things like team-based learning or the flipped classroom or better ways to teach. And it's not like test tube rocket science or anything like that! I mean think about it: I mean, when I was in med school, no one went to lectures! We had a note-taker. Now there's not a note-taker, but it's filmed, so no one goes! Because, why spend time in the class having someone just spout off information to you, when you can

actually sit and watch it at home on your iPad? Vice versa, why do your homework at home, when you can do it with an expert there to help you right then and there are if you have issues? So that's what the flipped classroom, where you do the homework in class and the lectures at home, and team-based learning are all about.

So, based on our needs assessment, our goal was to use that to figure out how to design a curriculum. And what we recognized is that all these people are giving informed consent, but they don't know anything about risks! What we're working on now, and I'm working with Michelle Zeller and Mark Fung through the BEST Collaborative, we're creating kind of a teaching session related to informed consent. And our goal is to have it more be in a small group, team-based environment, where people can practice informed consent on each other. We also want to create a rubric for how...you know now they have these "OSCE's" (observed structured clinical exams), a way that if you're observing someone give informed consent for transfusion, how do you know they're doing it correctly? How could you grade them on that? And we're again utilizing the expertise in the BEST Collaborative... What we're actually creating, actually to take a step back, we're using qualitative methods to ask the BEST Collaborative to design a gold standard informed consent for transfusion. Because people have kind of published like this is what you should do, but again, nothing's been validated. Right? It's just, "This is what we think is important." So using a similar survey-based approach called the "Delphi method," that's sort of what we did with the ratings for the exam, we're now doing it to ask the BEST group, "What are important topics that informed consent?", and to then develop an informed consent template. Then to use that to teach residents it's sort of more of a team-based, small group setting. And then to basically have a rubric to be able to grade people and determine whether people are actually giving informed consent correctly. So we're only starting this. But the idea isn't, we are definitely not just saying, "Let's put a few lectures together about transfusion medicine."

I'll just add one other thing. There's there's a pretty well in education there's a pretty well known work by a guy named Knowles called "[The Adult Learner](#)," [NOTE: *Commission-free link; neither Dr. Haspel nor I get a benefit if you purchase*] and the idea is, adults have different reasons for learning than kids. Kids are forced to learn algebra. Adults like to have some control over their learning or know that it's going to practical benefit. So that's why formulating this curriculum about informed consent, it's something very practical that all physicians need to know for transfusion.

**Joe:** [00:44:36] So you've actually answered one of my big closing questions and that that is, "How are we going to start using this data that you that you guys have have elucidated so clearly?", but I have another couple of questions about that Rich, so when we have this information...you know, actually let me step back for a second: I'm sure that there are some people that are listening to this episode that

are going, "OK, so how do I know what's been asked on this survey?" And I'll just ask you: **Is this still something that people can e-mail you and get a copy of this exam?**

**Rich: Absolutely.** I think we've had somewhere between 50 and 100 people e-mail us for the exam and we provide the exam and answer key. And we've had from multiple different countries. We just ask, because we want to kind of preserve the integrity, that if we send it to you, that we don't otherwise distribute it. But definitely, we created a tool that we hope people can use. And I know some places it's interesting some have continued to use the exam as a teaching tool. Some of what I've heard by word of mouth, members of the BEST Collaborative, and the ideas other people have written, it's a good way to start and see where your learners might be, or get ideas for a curriculum.

**Joe:** Right. And that's exactly where I was going with this. So if you had a copy of the exam, along with these two papers, which show kind of where the holes are, at least the big holes are in clinician knowledge, so I guess what I'm getting at is if you're someone who's in a hospital, and you're trying to figure out topics to teach to your clinicians, because I mean quite frankly, pathologists and in fact in many cases, medical laboratory scientists as well in hospitals are looked at as somewhat of the experts. So you could utilize this information to kind of target your teaching and target your curriculum for your discussions with your clinicians, right? Are you seeing anyone using it that way?

**Rich:** Well, I'll just say, you've hit the nail on the head. It's basically you can do your own local needs assessment, and you could basically say that...you know, maybe at your place they actually know what TRALI is, but they don't know what some of these other things are! It could also help guide you. I think, like I mentioned, sometimes people are so focused on what they do on a daily basis, like antibody workups, they think, "Oh, that's what I need to teach." So it helps you step back and think about, "well, what's really important though for the non-pathologist or the non-hematologists or a non-transfusion physician. In terms of your second question, one thing that Yulia Lin did is she actually used this exam...the other thing you can use in the exam for is to test whether curriculum is actually working. So what Yulia did, and was published in *Transfusion*, is she has something called "Transfusion Camp," and she has trainees from a variety of different specialties, anesthesia, Heme, Heme/Onc, other things, and she basically gave them the exam before and after their curriculum, and was able to show a significant improvement in results [NOTE: [Lin Y et al. Evaluation of "Transfusion Camp," a postgraduate transfusion medicine education program using the BEST-TEST knowledge assessment tool. \*Transfusion\* 2015;55:2049-2051](#)]. So that's another way you can use this exam is as a way to kind of test your curriculum. And, you know, you could pick and choose, if there are certain questions you don't think are worthwhile, you can pull them out, or if you want to add another question. But the idea is we really wanted to create a

resource that people could use, one, for their own local needs assessment. What do people know about transfusion where they are? And then, if they develop a curriculum, to see how well it's working.

**Joe:** [00:48:28] So the last question I have for you, Rich, is I think let's put ourselves in our clinician's shoes for a moment. You did some time as a clinician, as did I (briefly), so let's imagine that we're sitting here, and we're listening to this podcast, and we're clinicians and we're going, "Well man, I would really kind of like to know where I am with this, or what do I do with this information? How do I figure out what I need to learn about transfusion?" And maybe I'm living in another reality by saying that. But I mean, I think that's certainly a possibility. So what would a clinician do with this information?

**Rich:** Right. Well I think there's a couple of things. Of course they could request the exam and see how they did. And that would help guide even a personal needs assessment. But I think what we really need and clearly, things are already starting in this direction. What I would say, go find your transfusion medicine specialist and talk about, especially *arrange* a talk about a transfusion medicine topics for you and your colleagues. Have it based on what are these key areas? So it's really about building that relationship, and even if it's not teaching, just knowing who to talk to when you have a question. So I think it's about, one, they can do it on their own level, but also or maybe their transfusion medicine colleague doesn't know about the exam or something. It's about setting up own local teaching opportunities, I think.

Oh I'll just add one thing as an example, just about communication. One question we asked the internal medicine residents was, we asked a few just sort of baseline questions. So we said, "Does your hospital have transfusion guidelines?" All of them had transfusion guidelines, by the way, but 85% did know their hospital had transfusion guidelines. About 14% didn't know. And 97% knew how to contact the blood bank. But we asked, "Do you know how to contact a transfusion medicine physician?" Only 72% said they knew how to do that. So again, that's another type of needs assessment, where we have to build these linkages between what we're doing in the blood bank and other specialties.

**Joe:** Rich, I think that's absolutely true, and I think you've given us a ton of really great and important points that we can use in our day-to-day practice. So thank you very much for hanging out with me. Everyone, I just want to remind you that these resources are readily and freely available. All you have to do is get one of those articles that Dr. Haspel and I have been talking about, you'll find them on the show page at [BBGuy.org/042](http://BBGuy.org/042). Go to those pages, check out what I'm talking about, and actually Dr. Haspel's e-mail address is in there, and I've done this as I mentioned earlier: Just e-mail Dr. Haspel, let him know that you'd like to get a copy of this wonderful tool. And even if you do nothing else, use it for yourself, check out and

see where you are. So Rich, again thanks a lot. Is there anything else you want to leave us with before we go?

**Rich:** Well, I want to thank you, Joe, for allowing me the opportunity to talk about something in education like this. And I also just want to...I mean, this wasn't just me! There were a lot of other people. We mentioned the BEST Collaborative, we mentioned ASCP, and Yulia Lin, we've really worked together on this to try to develop the exam and really do this needs assessment. So there were a lot of people involved as well.

**Joe:** Projects like this take obviously take more than one person, and you and everyone that's worked on this has really done us a great service in blood bank world. So thank you very much and thank you again for being with me on the podcast, Rich!

**Joe:** Hey, everyone it's Joe with just a couple of quick thoughts. Just a reminder you can go to [BBGuy.org/042](http://BBGuy.org/042), that's BBGuy.org/042, and there you find a transcript of this episode as well as links to the articles that Dr. Haspel and I discussed today, including those results for both internal medicine and hematology trainees. Again, take it for what it's supposed to be, which is just a demonstration of areas where we can all improve and get better. I think it's really important to do that. I'd also love to hear what you think about all this. Again, no matter what your role, I'm really interested in your thoughts, so let's talk about it on the show page. I read *every single comment* and I love to interact with you there, again, [BBGuy.org/042](http://BBGuy.org/042). My thanks to Dr Rich Haspel, of course, for appearing on the podcast today, to the BEST Collaborative for the great work that they're doing, and to each one of you for listening and commenting. Just a reminder: Next time you're on or near your computer, please open up iTunes and give this podcast a rating and review. I really appreciate all of you that have done that already.

So that is all for today. Thank you again. And as we close, as always, I hope that as you go through your day, that you'll smile, and have fun, and above all, never, EVER stop learning! Thanks a lot. Catch you next time on the podcast.