



**Article:**

Xander M R van Wijk, Zaraith Sanchez Oviol, William E Winter, Neil S Harris, Maximo J Marin.

*An Introduction to the Complete Blood Count for Clinical Chemists: Platelets.*  
J Appl Lab Med 2024; 9(4): 833–47. <https://doi.org/10.1093/jalm/jfae023>

**Guests:** Dr. Maximo Marin, a Clinical Assistant Professor at the University of Florida for the Department of Pathology, Immunology and Laboratory Medicine, and Dr. Xander van Wijk, an independent consultant who previously worked with Beckman Coulter Diagnostics and as Assistant Professor of Pathology at the University of Chicago.

Randye Kaye:

Hello, and welcome to this edition of *JALM* Talk from *The Journal of Applied Laboratory Medicine*, a publication of the Association for Diagnostics & Laboratory Medicine. I’m your host, Randye Kaye. The complete blood count, or CBC, is one of the most ordered clinical laboratory tests worldwide. The CBC is often used as a screening test to assess overall health and it can aid in detecting a wide range of conditions such as anemia, infections, and blood cancers. CBC panels consist of several components, including counts and other properties of red blood cells, white blood cells, and platelets. As clinical laboratories increasingly automate and consolidate laboratory sections, the role of the clinical chemist has expanded to often include hematology testing, such as the CBC.

To address this, a group of authors sought to develop a three-part review article series in *JALM* to serve as an introduction to the CBC for clinical chemists. The goal of their articles is to provide readers with an overview of the analytical technologies, diagnostic approaches, and the interpretation and utilization of the associated tests within the CBC. The first two articles in the series, one focused on red blood cells and another focused on platelets, are now published. The third article, focused on white blood cells has been submitted and is currently under review.

Today, we’re joined by two of the authors of the article series, Dr. Maximo Marin and Dr. Xander van Wijk. Dr. Marin is a Clinical Assistant Professor at the University of Florida for the Department of Pathology, Immunology and Laboratory Medicine. He is the Medical Director of the Core Laboratory for the University of Florida Shands Hospital. Dr. van Wijk is a board-certified clinical chemist and independent consultant. Previously, he served as Senior Medical Director at Beckman Coulter Diagnostics and as Assistant Professor of Pathology at the University of Chicago. Welcome doctors Marin and van Wijk. Firstly, why did you decide to develop this review article series on CBC testing?

Maximo Marin:

So I’ll take a shot at this first. So, being part of the clinical chemistry/laboratory community for some time now, I’ve

seen colleagues and heard about other colleagues taking more of an active role in the hematology and even coagulation sections of the labs. So at least it wasn't surprising to me then when Dr. Winter, who invited me to assist him in authoring a manuscript where the intended readership was for the clinical chemists on the topic of the CBC. However, the original review was heavily focused on RBC's as I was reading through it and kind of working through it with Dr. Winter, which was great, but I felt that more was needed to support the community. Based on my experience and then also my educational style, I wanted to get a little bit more involved with this idea that he had. So then my idea kind of organically kind of grew out of Dr. Winter's original manuscript that he was putting together.

But I felt that there was a little bit more that was needed. And so, I decided to try to not only incorporate the components that he had originally in the original manuscript, but to expand the series out so that the CBC could encompass not only which Dr. Winter's original manuscript was focused on the RBC's, the red blood cells. I wanted to incorporate platelets and also the white blood cells a little bit more to give a more comprehensive view of this topic. I guess, finally, the last thing I would probably want to mention is that I also felt that it was very important to have a PhD clinical chemist in the authors, in the group of authors, in order to ensure that it was developed properly so that it can provide insight and also some practicality. So I tried to incorporate, have a more encompassing view of all of this.

Randye Kaye: All right, thank you. Dr. van Wijk, anything to add to that?

Xander van Wijk: Yeah, absolutely. So, as Dr. Marin discussed, I believed this is a much-needed resource. Clinical laboratories in the US are struggling with staffing and reimbursement challenges. And to keep the laboratory operational and financially sustainable, there is a move towards additional automation and integration. And more institutions are implementing so called core laboratory model with both chemistry and hematology connected to the automation line. So in the near future, and as it's already happening, I expect that PhD trained clinical chemists in the US will take on more responsibility around non-malignant hematology, in particular the CBC.

And so we actually already see this in a number of countries in Europe where, for example, PET trained laboratory specialists are more commonly involved in the oversight of hematology testing. And so for that reason, I've had a longstanding interest in increasing my knowledge and skills around clinical hematology and coagulation. And so I was delighted and particularly interested in participating in this series because I represent the target audience, as Dr. Marin

mentioned. And so I believe I could provide a valuable feedback to make sure that the articles have the right level of background and depth for our readers.

Randye Kaye: All right, thank you. That's great. So, Dr. Marin, what do you hope that readers will take away from having read your article series?

Maximo Marin: Yes, so while there were so many interesting concepts and topics we could have discussed, we had to constantly refocus what we needed to really get at. And we decided that the question we need to ask ourselves is, what is the minimum a clinical chemist needs to know to function comfortably? And so we had to imagine ourselves in a world as if this was the only resource for a PhD clinical chemist that they might have access to. We wanted to give them not only the competence with the CBC, but also the confidence to grow from this resource.

That is a difficult objective that we have placed on ourselves. I think it's a high standard with this series, but honestly, we may not have achieved it completely, but we gave it our best effort. We, given the constraints that we've had on our own professional lives, our personal lives and things like that, coming together to do this. I hope that the reader at the end will walk away with this review series is the development of a conceptual comfort with the principles, common conditions that you can see, in an approach to the automated hematology section.

Randye Kaye: All right, thank you. Well, high standards are very good. Now, it sounds like there's the potential for quite a bit of content in this topic area. So if you had the opportunity to author another manuscript or two for this series, what would you focus on? We'll start with you, Dr. Marin.

Maximo Marin: If I were to develop another manuscript in line with this series, I would like to help the clinical chemist feel comfortable with hematology but from the perspective of the morphology of the red blood cells, the platelets, and even the white blood cells that you can see in the peripheral blood smear. I think that's something that clinical chemists can be disconnected from frequently. And so I think what I would like to do in that kind of manuscript is connect what you would see in the peripheral blood smear, but also what kind of lab results you might see in the automated sections, whether it's coagulation in the hematology analyzers, even the chemistry analyzers. And that would be something that I would like to do if I could. The goal would be to be as creative as possible from an educational style. So there are people out there that have discussed these kind of things, but I would try to do it from being a little bit more creative and making it a little bit

more practical and providing a lot of insight so that it feels intuitive.

Randye Kaye: All right, thank you, Dr van Wijk?

Xander van Wijk: Yeah, so in addition to what Dr. Marin mentioned on the peripheral smear, which I think would be very useful, I think additional manuscripts on practical and operational considerations could have been useful. So I'm thinking about most common problems that are faced, quality control practices, considerations around which of the CBC parameters that we have discussed in the series are essential and which ones may be optional to report. And one can also think of laboratory stewardship considerations on how often a CBC should be ordered, for example. And then finally, another option would be a manuscript with case examples that would help the reader to apply the information from the series in a more practical manner.

Randye Kaye: All right, thank you. Well, while I have you, Dr van Wijk, finally, through the process of developing this series, what's something new or unexpected that you learned?

Xander van Wijk: Yeah, so while I had some working knowledge on these diseases and conditions that can decrease or increase the specific CBC parameters, for this series, I really had to deep dive into many common and also less common causes of like thrombocytopenia, lymphocytopenia, and lymphocytosis, for example. So I really read a lot of papers and learned a lot of details on numerous different disease states. And unfortunately, many of these details did not make it into the manuscript for the ease of reading and the word count limits. But that's definitely something that I learned. And so, to close, I'm very grateful to have participated in this series and I've actually received a lot of feedback already from my colleagues, who are saying that this is a much-needed resource that they appreciate and are planning to read.

Randye Kaye: All right, thank you. And I'll put the same question to you, Dr. Marin, something new or unexpected that you learned?

Maximo Marin: Yeah, so I kind of knew this somewhere in the back of my mind. The trained clinical chemist has so much to offer the automated sections of the laboratory, the tools and the skills of a well-trained, thoughtful clinical chemist.

That skillset is much needed in hematology and even in coagulation. I have colleagues who work in coagulation as well, and I didn't quite see it so clearly until I started going through this process of writing this series. And so, I'm extremely thankful like reflecting on it and kind of writing it out, of my clinical chemistry training and all of the colleagues that I've met throughout the years. It's a great community

and we really have helped each other along the way. It's made my career excel. And so I'm really appreciative of all those things. I guess I'll say this, and I kind of say this, of course, I'll say some of these things with a bias because I trained in clinical chemistry and I have this a little bit.

But I really think that if you've gone through a good clinical chemistry fellowship program, you can learn anything and you can apply the skills in any sections of the proportions of the lab. I'm a strong proponent of evaluating a laboratorian based on the individual skillset. That includes leadership style, communication, scholarly work, interests, habits, and motivation. I don't really focus too much whether you have an MD or a PhD. For me, the trained clinical chemists and the skills and the tools that they have, in my opinion, they're at the apex of laboratory medicine. And the specific area which a clinical chemist can learn with proper guidance and mentoring, it's unlimited.

So it's not to take away from other fellowships or other skill sets in lab medicine. I just think that learning what the skill sets in clinical chemistry, they're complex and once you learn them, you can apply them anywhere in the lab. Where I don't think the opposite is true, where someone who learns, has a fellowship in another area of laboratory medicine can apply it directly into all of the other areas or even in clinical chemistry. So again, I'm biased though, right? So I would point that out. But, you know, up to this point in my young career, I haven't come across a lot of people that can do some of the things a clinical chemist can do, but I'm open minded about it. Of course, like, I again have this bias, but I think that a clinical chemist with the skill set can do almost anything.

Randye Kaye: That's great. Thank you so much for joining us today.

Maximo Marin: Thank you.

Xander van Wijk: Thank you.

Randye Kaye: That was Dr. Max Marin and Dr. Xander van Wijk describing their three-part JALM review article series, "An Introduction to the Complete Blood Count for Clinical Chemists." Thanks for tuning in to this episode of *JALM* Talk. See you next time. And don't forget to submit something for us to talk about.