Jennifer Savage, ND 0:01

So red blood cells and hemo concentration

Alright, let's go back to the red blood cell. All right, this all sounds basic. But let's really talk about this. Now, on this page, this is all this is just the actual words behind the letters that we use are B C's red blood cell. hgB is hemoglobin HCT is hematocrit. MCV is mean corpuscular volume. MCH is mean corpuscular. haemoglobin. MC HC is mean corpuscular haemoglobin concentration. This is likely a percentage. Now, what does the word mean? Mean? It means average. This is important that you understand that this is the average. So when we're looking at a high MCV, we know that that is the average of all of the red blood cells. Now, it doesn't mean that there can't be small ones. But it means that whatever level the MCV is at, the average is going to be that size. Let's see. And our dw is red cell distribution width. All right, now, let's investigate these a little bit more. Because some of you know some things about these. There are pieces missing. You know macrocytic, and, and microcytic, you know, hyperchromatic and hypochromic? Well, now we're going to put them into play. And we'll do an example at the end. Alright, so where does all this start from it starts from the blood draw. Okay, so a vial of blood is a standardized amount drawn. When you go in to have your blood drawn, they insert the needle, and they pull out an exact amount of blood for whatever they're testing. So if it's a CBC, there, they're pulling out an exact amount of blood. And that vial, then, you know, goes through certain steps, and I have illustrated them in here in just a minute. But we'll look at them then. But this is the part that I need everybody to get their head around, that when we're testing blood, when we see all these different measurements in here, it all came out of this little vial of blood. That's what we're testing. That's what we're looking at. That's what's actually in there. So the RBC is the cell and the hemoglobin is the hemoglobin. Everything else is just a characteristic of these two. And everything is based on the red blood cell. So in a red blood cell

in a red blood cell. Let's see. We are looking at now want to stay on that slide. Okay, we're looking at how many actual red blood cells are in that standardized amount that was just drawn. So in the needle in the vial of blood that was just drawn at an exact amount. So it is considered standardized. There are a standard amount of red blood cells to be expected. When the hemoglobin is measured, this is the weight of hemoglobin. So it measures the weight of the molecules of hemoglobin in each red blood cell. And I don't remember the exact amount but I think this is pretty close. If I tell you I think there's like two 188,000 molecules of hemoglobin in a red blood cell, the amount is that high but it could be like 283 or 292 or something like that. I think it's 288. And hematocrit, hermetically hematocrit is and will, we're going to use this in a picture here in a minute. But him adequate is the percentage of blood, how much of the blood that they just drew. That contains red blood cells. So let me just hop down here real quick, because I do want to show you this. And when we get down here, to this part, you're going to see that one this vial of blood is has gone through the centrifuge. Then this part down here, this red part is technically the hematocrit because this is the total amount of you know that, that section right there. And that is the percentage of blood in that vial that contains RBCs. So then we look at the MCV. And we're asking, Well, what is the volume or the size of the average RBC? So in your head, you can be picturing these red blood cells. And of out of all the red blood cells in that draw that one vial of blood what's the average size? Now, average size might be fish think about this. Let's just say you had 100 red

blood cells, and they were littles and mediums and bigs. So we had 50 bigs. We had 25, mediums, and 25, littles. So the average of all those would be the bigger size, right? Doesn't mean we can't have other sizes. It just means that the average of that one blood drawn is telling us that there are more larger red blood cells than any other size there.

I just made these slides, Lisa, but they will be in the resource store. Yes, they will. You're welcome. Okay, so then we go on to MCH? Well, this is going to, again, address a characteristic of that red blood cell. And it's asking, well, what's the average amount of hemoglobin in the red blood cell itself? Now, this is the question we just had about the size, right? So we might have some red blood cells that have you know, just a regular amount of hemoglobin in them, but some that might not have enough. And so between those two measurements, what is the average amount of hemoglobin in the red blood cell? Alright, MCH, see, this is a percentage. So it's not a weight. It's not a size, what percentage of the actual red blood cell has hemoglobin? Now, and again, I'm thinking that I'm right on this number. I think it's like right around 30 to 33% of a red blood cell is filled with hemoglobin has other things in it too. But that's roughly what we're looking at. That's how we get the functional range. So some people might say that it's higher and that's why I'm telling you I'm, for me, I'm positive that that 30 Oh, what is it 32 to 36 range is a pretty good optimal range to be in. But this is the functional range that we use to see what might be falling outside of that and possibly trending or possibly giving us more clues to any characteristic of the RBC. Alright, our dw, this is the percentage of variation in size of all the RBCs This is no different than how we are picturing in our heads about the average volume size, the average amount? Well, this is percentage of that variation. When we think of big red blood cells, and little red blood cells. There's a variation in size there. Well, what if we have littles and then a bit bigger and then medium and then bigger than that then really big. That's a lot of different sizes of red blood cells. And hence, our percentage will increase. So when we look at our dw, this is what it's telling us. How many different sizes are there? Because there should really only be one size, right? A normal size red blood cell.

Okay, perfect. 32 to 35 on my spreadsheet, I couldn't remember what it was. So, yeah, so 33 would fit just fine. Yes, so there should be a lesser percentage of variation. We don't want to see this high. Because then that's kind of telling us something's wrong, right to have all these different sizes of red blood cell. Because why do we have red? A big red blood cells? That would be a nutrient deficiency? Why do we have little red blood cells? Well, for different reasons, but one could be a nutrient deficiency. Alright, rd W. Nina says. So our DW reflects how active now it has nothing to do with its activity. It has to do in that one blood draw? How many different sizes of red blood cell exist? Now let's take a look at this.

Unknown Speaker 11:55

But what I'm just curious, what is that reflection of what the size because for some reason, I believe that our W, if your body tries to build new blood, then we have bigger our W that was my belief, I guess it was wrong.

Jennifer Savage, ND 12:26

I don't know unless you know, when you're, you're putting out red blood cells, if you're putting out a bunch of small ones or putting out a bunch of large ones that will change the RTW you know, in that sample, but it's just the red cell distribution width, it is only measuring the width of the red blood cell. That's it.

Unknown Speaker 12:51

So I see,

Jennifer Savage, ND 12:54

an RD W of 12.5 is going to look like this. So each each one is that or ord less than that an RD WF 12 or, you know, even 11.5 it will drop down doesn't mean there's any change in the size though. It's when the percentage goes up, that we start seeing the variability. There's littles and bigs and then we can have anything in between.

Unknown Speaker 13:24

So sometimes it tells us that I'm just trying to understand. So if our W is higher, it tells us that there is some disturbance in blood building process.

Jennifer Savage, ND 13:41

It tells us there are different sizes of blood cells.

Unknown Speaker 13:47

That's it. Okay. Now, what about hemoglobin?

Jennifer Savage, ND 13:53

Okay, well hold on just a moment. Let's go. Let's finish this thing. All right, well, hold on a minute. And let me get you an answer here. The rd W. When we see littles like this, and then we might see let's do this, you know, even bigger ones. So we might see three different sizes, that's going to continue to raise that rd W up because it's telling us the more and more different sizes we have, the higher it goes. Now there's nothing good about having bigs and littles and mediums. So yeah, there's a basis to that we have to understand what that is. But, again, we just want to be clear, that that's the only information that it's

giving us that there are different sizes, any other information about the why there's different sizes, we'd have to find somewhere else.

Unknown Speaker 14:54

Okay, so that was my question.

Jennifer Savage, ND 14:57

Okay, so what about your hemoglobin

Unknown Speaker 15:02

Ah, for some reason, I thought that hemoglobin reflects the amount of hemoglobin in the wild concentration of hemoglobin in the vial. Not inside the cell, am I confused or what?

Jennifer Savage, ND 15:20

It's inside the cell because that's where hemoglobin is found.

So when we measure this,

Unknown Speaker 15:30

I don't understand.

Jennifer Savage, ND 15:36

hematocrit is the percentage

Unknown Speaker 15:38

of flow and why. So in dehydration pattern, then hematic rate will be elevated and hemoglobin won't be elevated.

Jennifer Savage, ND 15:53

Now all three will be elevated RBC, hemoglobin and hematocrit.

Unknown Speaker 16:07

Then I'm totally confused. Okay, we'll just hang in there. Think about it. Okay. Okay, hang in there.

Jennifer Savage, ND 16:13

Okay, do you do that? Jen says, but we cannot know what sizes and variability there is. But that is why we look to other markers. Yeah, and that's exactly what we're going to talk about today, how we can really utilize these other markers, like, like we've been doing. But we've only been doing this through me showing you and talking you through bloodwork, you know, when we're looking at it on a form. And this is why today I wanted to get a little bit more intense with actual images, to kind of work through this and and show you what these characteristics can tell us. And how we should be picturing them. Yes, blood is concentrated with dehydration. And we're definitely going to get into what that looks like as well. So we can know what sizes. We know, if you know whether there's dehydration or not, if the red blood cell count is low in that sample, then hemoglobin is going to be low. I mean, that just that is just a standard follow, okay, you're not going to have a small amount of RBCs, and then this huge amount of hemoglobin because that's just not possible. It's only measuring the hemoglobin that's in the cell, the red blood cell. And if there's not a lot of them, there's not going to be a lot of hemoglobin. If there's not a lot of hemoglobin, then it cannot do its job of carrying and delivering oxygen. Jen says so can we see an elevated MCV? If there is dehydration and lower RBC? Absolutely. Yeah. Because this is why we use these measurements and these characteristics. Because they can tell us things that we just can't quite see. Like if we have an elevated MCV. And we're going to be talking about this specifically. And and we know that it's hypochromic. We know it's big, it's red, it contains a nucleus, there wasn't enough B 12 for it to fully mature, and spit out the nucleus. So we know that that shows up on a blood test. It's there. But that doesn't mean that we can't have low hemoglobin and small red blood cells at the same time.

Yep, Jen says, gosh, so many people are dehydrated, especially when they go in morning for fasting labs. Yeah. And that's a concern when we you know, can't always see if it's a chronic situation or not. Sometimes we can sometimes we get all the markers in place. And we see high albumin and high bun and, you know, these high red blood cells and are in the fives or whatever. And everything just fits perfect. And that's more of a sign of chronic dehydration that this was more than just that they didn't drink enough water before the lap Tiana is asking is there an issue with too much hydration before blood draw And Nina says it is a good idea, is it a good idea to instruct clients to have a glass of water? Yes, definitely have a glass of water with pinch of salt. And I would say, you wouldn't, you can definitely drink too much before a blood draw and skew those amounts. But I don't believe that, you know, having a six ounce glass of water is, is harmful, you need to you really need to

now, if this is the only time that you have water in the morning, and you don't have dehydration on the panel, or if you do have dehydration on the panel that you might want to consider drinking more water anyway. Jen says it also helps blood flow makes that easier. Yeah. And when we were going to look at

everything that's in the blood, and the plasma, and these are pretty important things. So they need to flow. This is why I want all of this to make sense today. Because you don't have to remember the the actual what these letters mean. But you have to understand what this characteristic is describing. Alright, so we went over our dw, and that's the variance in size. Dana says, I feel like I'm in first grade. Well, welcome to the first grade. Okay, let's see. Um, Lisa says, how volatile are the electrolytes for one blood draw? You said a pinch of salt. But I imagine if low sodium, that will still be the case with or without the pinch? Yeah, it will, because number one, a pinch is going to be pretty tiny. But number two more importantly, is that this is not dietary sodium that we're looking at it is the control of aldosterone, that we're actually measuring there.

All right. Oh, okay. I almost missed one. Now, the RBC, the hemoglobin and hematocrit? These right here, they determine whether there is a functional anemic tendency, which is equal to 10 these cells carry and deliver oxygen. That's your question. That is the question that you ask. Are these of a level that can carry and deliver oxygen? Are they too small? Are they too big? MCV I shouldn't say too big. Are they just optimal MCV MCH MC HC. These can help you figure out why there may be an anemia here. Production destruction or loss. Anybody who does any work with Walsh knows these are the three things that we are looking for. When we talk about red blood cells. P DRL. Losses is going to be blood. It's that simple. If you are on your cycle, if you have gastric issues, Crohn's disease, some tiny bleed, that's going to be a loss. Alright, so what does everybody think? I mean, we can have a lack of production. So what's going to affect production? What's going to affect the production of red blood cells and the production of hemoglobin?

Unknown Speaker 24:18

amount of nutrients.

Jennifer Savage, ND 24:20

Absolutely. Yes. Yes. So then we have to consider you know what's happening up here. If these are low, then what's happening here? And is it indicating to us that there's a production problem and destruction we might find in inflammation and oxidative stress. So that's also something you know, that we have to keep in mind as well when we're making a decision about well, what am I seeing here? Okay, so now we're giving out a $10 gift certificate again, I know you're all excited. So whoever is ready for a prize question and the question is, why are RBC figures higher for men? Now you all have, you know this form and you know that they separate RBC, hemoglobin and hematocrit between male and female. Let's see, Lisa says turnover is slower without a cycle. No. Gail, women having a period no

I know that we've never talked about this, but I'm kind of it makes me giggle that no one's ever questioned it either.

Karen Ellis 25:59

You say it was that? I mean, I'm looking it up. So it's not fair. I'm not gonna say anything, but I had no idea.

Jennifer Savage, ND 26:05

You can look it up. Give the right answer. That's fine. How's she gonna know? If you're sitting there and you don't know. Then you need to look it up. You need to research it.

Karen Ellis 26:12

But it's stimulatory effect of androgens on the bone marrow? Never such a thing.

Jennifer Savage, ND 26:19

Um, you got the answer, but it's not the whole answer.

Karen Ellis 26:24

percentage of body fat.

Jennifer Savage, ND 26:27

Sylvia says more muscle requires more RBCs and oxygen. Now that's a good thought. But that's not quite it.

Unknown Speaker 26:37

Wow. What a great question. Why don't we know that?

Unknown Speaker 26:50

Oh my god, it's a very low amount of tickle.

Karen Ellis 26:53

Because they're larger on average, men do have larger hearts greater and more hemoglobin than women even allowing for the size difference. Because I had to look it up, but

Jennifer Savage, ND 27:06

Well, you're not getting the money because you didn't get the answer, right. Well, I

Unknown Speaker 27:10

did. I'm reading it.

Jennifer Savage, ND 27:12

No, it that's not it. Oh, it's not

Karen Ellis 27:15

transporting more oxygen around the body.

Jennifer Savage, ND 27:18

No, the reason that there Rbc Rbc figures are higher is not because they're larger, or because they're men. But it is because of something inside of them.

And you had it in the title. But it wasn't the one thing that we needed to hear. Yes, Lisa got it. Lisa got it first and Gail came right in to stop Stryn. Okay,

Unknown Speaker 28:01

so why I don't

Unknown Speaker 28:02

Yeah, I was just gonna say I don't have a clue why looking it up, please.

Jennifer Savage, ND 28:09

Well, because testosterone will raise up. Alright, let me put it this way. When there is more testosterone present, you're going to have more RBCs you're going to have more hemoglobin and hematocrit. Now the why behind that you all can look up. But here's what I want you to understand that it's typical in

men because men have more testosterone. This is why we have this separation here between these two. But the other part of this that I want you to think about is in a woman when we see an elevation here and and technically even in a man, but in a woman specifically. Maybe she has dehydration, but what if she is maybe her husband is taking topical testosterone and it's rubbing off on her. Or she's supplementing or taking DHEA or anything like that. This might be a different and new clue. Yeah, exactly. Yep. PCOS, absolutely. Extremely possible. Now, how much will it raise it up? You can have both things. You can have higher androgens, you can have dehydration, alright, it's not exclusive. It's not one or the other. But I want you to be aware that there, especially for women. There is this other added consideration. Now there's ways to tell more about what it is. But we'll look at those in a minute. Yeah, Moray, I don't know how strong the effect Oh,

Unknown Speaker 30:09

if the woman is it vice versa? If the woman has very low on testosterone and very low on D Qi? Will it affect? blood count?

Jennifer Savage, ND 30:28

I don't know that it will. It will only make it too high, just like overhydration won't, won't necessarily raise the red blood cell characteristics, but dehydration will lower them. So I think it only goes one way as far as I know. But you might discover something, you know, different.

Unknown Speaker 30:54

No crazy Interesting.

Jennifer Savage, ND 31:03

All right, now.

Unknown Speaker 31:08

So if we have somebody that has like red blood cells, that's a female and say, Apple has excess weight in their red blood cells are like just under five? Um, are we saying we can't just assume that's part of a dehydration pattern, we have to consider that there could be a testosterone piece to that.

Jennifer Savage, ND 31:28

No, I wouldn't jump there first. I really wouldn't. And let's see, Moray was asking how strong the effect is, you know, I, I want to take that back, I, I do think that it would have to be a pretty strong effect. Okay,

in order to raise that up, and pretty consistent, too. And the reason I say that is, let's not forget that the red blood cell is going to last for 120 days, in most cases. So if we're looking at this, we're looking at the average we're looking at a sample of blood drawn, that contains different ages of the red blood cells. So for instance, if her husband was using a topical tea cream, and it got on her, and she dealt with that for a month, you know, and he's he quit using it, and it finally wore itself out of her system, we might see at the end, or during that sample that included that one month of use did it was raised up just a little bit, but the other three months would offset that. So I don't see that we'd be able to tell that. And if androgens were not through the roof, you know, for four solid months, I don't think we'd be able to see that. But specifically testosterone not and I'm being very clear about this not just androgens in general

Nina says I guess men are designed for losing blood in a fight with tigers. Yeah, yeah, exactly that and it's going to happen to men too, just for the record. Now. If they are taking exogenous testosterone then we would expect you know, if they're taking a good amount of it, we would expect to see the potential for an elevation there

Okay, any other questions? Comments

Okay, now when we think in our heads about the mean corpuscular volume Oh, Moray, this just complicates the interpretation. Oh, sorry to hear that. Mean corpuscular volume is telling us about the red blood cells. So we've got this red blood cell right here. And day after day after day, we have red blood cells being made. They they do their work, they travel through the body they deliver and carry oxygen. And at the end of four months, you know they die and and other things happen. But while they're here, they're all about the same size where they should be standard red blood cell day and down. So When we have big ones like this, or tiny ones like this, that's an indication that something is not functioning. Now, when we look at the MCV, and if the MCV tells us that it's 85, right, this is an 85. To me, this is what I picture in my head. Nice little size, you know, very common size, little red blood cell. And when I see on a, on a blood chemistry, an MCV of 9394 95, this is what I'm picturing. Big red blood cell. And then when I see an MCV, like with gales tell a Samia client, you know, where they've got an MCV of 78 or below and i think is like 60. This is what I'm picturing a tiny, tiny red blood cell. It's not big enough. It's not adult enough to do its job. So we have many different sizes. Now. Do you all picture when you see on a blood chemistry, when you see the number of the MCV? Do you picture these little red blood cells, the different red blood cell sizes in your head? Sylvia says yes. Gail says now I do. Yeah, Lisa does now. So this is what can help us start to really formulate that interpretation. All right, now. We typically on a blood chemistry, we have an MCV, MCH and an MC HC right in line with each other. We see one right after the other. And it's in those times that we should be picturing as well that when these are little, they're pale.

Nina, I have that same image of big ones trying to squeeze through the tiny capillaries and they just won't fit. Yeah, they just won't fit. And so when we have an average size or an optimal size of MCV, we know that they're just an average red color. Now here when they are way too big, we should also be

picturing them not only super red, hyper chromic because these are hypo chromic right here, the pale ones. But these characteristics for the MCH and the MC HC, are big, and they still contain the nucleus. And that's because we know that B 12 and or folate are not there to help remove that nucleus because that's what happens during overthrow priests. So these are super read, I probably should have gotten a cell picture that was so beautifully read. But that's this is how we should picture it. This is medium red here. And this is like super, super red. There's so much concentrated in these bigger cells to give it that ultra red color somebody says can also happen with low copper. Yeah, on on the microcytic side. Yeah.

Silvia 39:04

So in this case, you wouldn't see large red blood cells that are not like that still have that nucleus in there. You wouldn't see that with low copper. I always thought that you can have high MCV because there's nutrient deficiencies as well.

Jennifer Savage, ND 39:28

Well, those nutrient deficiencies, though. And here, let me before we go on, I want to answer this but I also want to let me open this other one up. Okay, so for the earth ROPO VSAs. Now, that's not the one I wanted to hold on until I've got it in the slide. So nutritional anemias There we go. Okay, so when we're talking About nutritional anemias, we've got these five right here. And copper is definitely one of them. And when we split them up, we're looking at B 12. And fully being the nutritional anemia, that creates a macrocytic. And a B again,

Silvia 40:21

so with only those two nutrients that might be lacking if we see a large MCV, not any other nutrient deficiency,

Jennifer Savage, ND 40:29

there could be other competing and existing nutrient deficiencies. But as far as anything else, it's going to make the red blood cell too big. It's going to have to be one or the other. So,

Silvia 40:52

one or the other meaning be 12. Or fully.

Jennifer Savage, ND 40:54

Yeah. Okay. Yeah.

Silvia 40:57

So I guess you can have all three as well, you could. But it has to be one or one of those be 12 or full eight, right?

Jennifer Savage, ND 41:07

Right. Now, the thing is, there may be a third one, and I'm thinking, and I don't see I don't normally say this, I'm kind of grasping here, but I believe it is B six, that that is also part of what's necessary for nuclear maturation. You would, but it's only a small part. Okay. So it's, it's more likely 99% of the time that there's going to be an issue with this b 12, or folate.

And so again, if anybody wants to check this out in the nutrient nutritional anemia slides, so the macrocytic part is, you know, one nutritional anemia. And the microcytic are the other ones. And we can have both. Now, if we have a really low B six, like I just said, here's my thought behind this, a lot of times we'll see evidence of a micro Siddiq and macrocytic. Okay, if B six is a part of the microcytic, it can also be a part of the macrocytic. I just, I just don't think that it's the bigger part, it's not the determining part. And if you had perfect b 12, and fully but you had low B six, I don't know that it would be enough to raise or to create a lack of maturation in the red blood cell. Because it does depend on so many other things.

Silvia 42:56

So I'm just trying to understand, I guess I'm trying to I'm thinking of my own personal case, where I'm, you know, you have somebody who takes sublingual V 12, every day, and has high serum and has normal MMA and folate is plenty. And you still have large MCV, like large red blood cells. So I'm trying to understand where else we could go with that if those pieces are sort of taken care of.

Jennifer Savage, ND 43:31

Well, that's a good place for investigation. And that sounds like a place where I want to be. So I'm going to put that on my list. Hopefully we can get an answer by Wednesday. Let's let's look into that.

Silvia 43:48

Yeah, I thought of the genetic aspect as well. But I don't think that that's present for everybody. So there's Yeah, I don't know how common that is?

Jennifer Savage, ND 43:57

Well, the genetic aspects of interference with B, 12, and folate are pretty common, I think. Okay, because we're looking at MTHFR mtrr. And a couple other little snips in there, which can be you know, in any position, any variation. So I don't necessarily know that that's going to, you know, reduce it enough. I think there might be something else there. So,

Silvia 44:26

and then I guess the further question is that if it is a genetic aspect of what can be done in that case,

Jennifer Savage, ND 44:33

well see, here's the issue. If, if that was genetic, if your whole picture was genetic, MCV is still high. MMA is optimal. Too much. You've got too much in the blood. And you have enough in the cell. So you can't take more. Right?

Silvia 44:55

Right and then there but there's still symptoms present that is showing There's, you know, be 12 as an issue, you know, with the nerve nerve extremities in the, you know, coolness and numbness in the extremities all

Jennifer Savage, ND 45:11

that, then I would question if that was truly a B 12 symptom,

Silvia 45:15

or something else. Right.

Jennifer Savage, ND 45:18

So that would that would push me away from thinking it was a B 12 symptom with the specifics that you have. Okay. And that's very likely, there are several things that mimic that. So oh, by the way, glad to collect you recuperated from the niacin flush.

Silvia 45:43

Oh my god, that was that was like not not a good time. I was at work. And I was like, I went to the bathroom. At one point, I looked at my face, and it was like, it looked like I had a very severe sunburn. Oh, like, but it was just painful afterwards, because after the heat, you get that prickly prickliness. And it was just it lasted for like, a couple hours. And then it finally started to dissipate. But I was like, Oh, my God. Like, that's, that's just

Jennifer Savage, ND 46:18

what I was feeling for you. I really,

Silvia 46:21

I was like, I'm just gonna try this, you know, because, you know, it might help and my, you know, with my circulation, but I know.

Jennifer Savage, ND 46:32

And now see, you raise a good point, lower circulation is something that you think you've had your entire life, right?

Silvia 46:40

Yeah. And I mean, I did go to when I, you know, recently had this toe thing a few a year ago with, you know, went to my doctor, and she said, Oh, it looks like you have you could have a mild form of Raynaud's is what she told me. And she said, Oh, it looks like your circulations. Good. But I'm like, Um, no, because in the I know, because in the summer, my feet go bright red, you know, and in the winter, they can go, you can go the opposite, they can go like a bluish color. It's kind of crazy. And I always have that coldness in my extremities. But I've had that all my life. So I know that it's a circulation issue.

Jennifer Savage, ND 47:18

I know. Well, being a circulation issue, though, is another reason I might suspect that those could be mimicking some of the B 12. Symptoms, right.

Silvia 47:30

Yeah. Yeah. So look, look elsewhere in terms of what could be going on. Lifelong. Yeah. Yeah.

Jennifer Savage, ND 47:41

And I know that you've been an active person your entire life. I get that. Yeah. So when I was mentioning to you about the what am I call it? You know that stuff. Castor Oil?

Unknown Speaker 47:57

Because,

Silvia 48:00

really, that's actually been helping with the itching? In my

Jennifer Savage, ND 48:03

Oh, well, good. Good. Yeah. One of the things that I was thinking of was lymphatic movement, that part of the way you described it with the outside, I believe you said the outside toes coming in?

Silvia 48:18

No, it's the third toe and each foot that that's red, and gets a bit swollen and itchy. And then they go blue sometimes. And I so I try and elevate, kind of keep that moving. But I noticed that more when I'm in the mornings when I'm doing my yoga in the mornings. And I just peered down on my toe. It's like blue.

Jennifer Savage, ND 48:43

There could also be a structural issue there.

Silvia 48:46

Yeah. Yeah. And I mean, that's only been in the last few years it showed up. I've never had that before. Okay, okay. Something's getting worse. Which is I'm not understanding why because if anything, I'm doing everything better. So I don't know what.

Jennifer Savage, ND 49:03

Yeah, I would also consider whatever it is you're doing while it continues to get worse. What were you doing when it started? You know, what are you doing right now that could be exacerbating it?

Silvia 49:15

Oh, Nina, the meridian. I actually looked that up. It's, um, it's actually sinus and head. Which is very interesting, because I mentioned about a month ago that and I asked a random question, during one of our calls about a smell like, almost like a chemical smell in the nose, if anybody had any. So I've been actually researching that because I've been looking into that. And I'm like, you know, I still get that every once in a while and I've been having headaches more. But I'm not having congestion and I'm not having runny nose. I'm not having any of that. So I sort of fits the bill for a sinus infection, but I don't have that congestion. So I don't know what's going on. But I find it kind of interesting that it is Those toe those toe meridians are sinus head. And that's kind of cool corresponds with the symptoms I've been having the last month. I don't know. You could

Jennifer Savage, ND 50:13

definitely correspond those meridians to the acupressure points. And consider, you know, doing that without the actual acupuncture just acupressure.

Silvia 50:27

Yeah, yeah, I've been trying to just starting to do that, too.

Unknown Speaker 50:31

So maybe it is a structural issue and the structural issue creates some energy block. Positive thinking out loud.

Silvia 50:44

Yeah. Yeah.

Jennifer Savage, ND 50:46

Yeah, very well. Could be. Karen noted. Done. Do you have any root canals?

Silvia 50:51

No, I have some silver fillings, though, that I've had since I was a kid. So there's that.

Unknown Speaker 51:01

There's always that Yeah.

Jennifer Savage, ND 51:05

All right. Well, we'll keep exploring that. And I do want to investigate your question. And I of course, I know you are too, but we'll just regroup on Wednesday. And see if we can't get that more fleshed out. So when we have adequate B 12 in the cell, and the appearance of adequate folate, and a high MCV. What does that mean? And that's basically what we're looking for. So anybody who wants to do that work, you know, to research that and bring something to the table on Wednesday. I encourage that. All right, back over to the chat window. Karen was Osco. Also, gosh, why can I not talk today? I think I've got so much to say I'm just like rambling here. Do you eat eggs and dairy?

Alright, so Silvia is answering that one. And okay, Nina, we're actually not going to talk any more about silver fillings and root canals today. Alright, so these pictures, I developed these pictures so that you would have something to visualize when we're talking about these numbers. All right now,

Unknown Speaker 52:33

Jen, does the MCV I'm sorry. Is that at all connected to the hydration picture?

Jennifer Savage, ND 52:38

It can be? Yes. It can hold that. How does that work? The size of it might be showing up a little bit more. If there's like more of them. So it appears to be bigger.

Unknown Speaker 52:55

So it's more concentrated? So it's like a bright?

Jennifer Savage, ND 52:59

Well, yes. And no, we're actually going to get get to that. So hang on just a second. I think it will make better sense. Okay. All right. So when we draw a vial of blood, it looks like this. It is drawn to a specific. Here we go again, specific mark on on the vial. Does everybody understand that, that there is an exact amount of blood that is drawn, so that this creates a standardized way of reading the amount of all these markers on a blood test. Okay. Now, each vial of blood is not only drawn into a specific amount, it contains plasma, white blood cells, and red blood cells. So here we draw the whole blood, it's all red. We put it in the centrifuge. We let it we take it out, we let it sit. And it separates into three parts. So we have the plasma, which is the majority. We have the formed elements, which is the red blood cells, white blood cells and the platelets including this. This little band here contains those white blood cells and platelets and that's called the buffy coat. Platelets, white blood cells. All of these are in that little

buffy coat. Not very much there. And I think I even had the wrong wrong number on here. I'll show you but yeah, this should be like 7% because these will fluctuate. This might be like 56 then this might be 46, or 47. But these all add up to 100. Or at least they should. Buffy code is not a full 10% of this formulation. Now, plasma, it contains proteins, glucose hormones and more things. buffy coat contains white blood cells. And then this right here is technically what we could call the inadequate it is the amount. And let's go back here hematocrit, the percentage of blood that contains red blood cells, okay, in a vial. This is the percentage of blood that contains red blood cells. This is technically known as the ematic portion. Now, plasma is the largest part of your blood right here. It makes up more than half about 55% a little bit more. And here's the key. Its overall content. And plasma itself is just over 91% water. Okay, so that leaves all of these proteins and glucose and hormones and lipids and all of that to be about 9% 8% of what's left in here. Plasma is 91% water. So keep that in mind. This is not just a bunch of stuff. It's a bunch of water with a little bit of stuff in it. All right. Now plasma carries water, salts, lipids, and enzymes. The main role of plasma is to take nutrients, hormones and proteins to the parts of the body that need it. Plasma is the vehicle, it's the car it carries. All of this everything you see here is carried by plasma red blood cells. Jen says so if we are dehydrated, plasma gets super concentrated. Yes, it does. Now, cells also put their waste products into the plasma. So the plasma then helps remove this waste from the body. Blood plasma also carries all parts of the blood through your circulatory system. Along with water, salt and enzymes, plasma also contains other important components and these include antibodies, clotting factors, and the proteins albumin and fibrinogen. And globulin, and we'll talk about that too. Yeah, Nina, it's a river.

Okay, so these plasma proteins, albumin, globulins, and fibrinogen. These three specifically, are so important. albumin helps maintain the colloid osmotic pressure of the blood. And you can read through here I mean, I didn't write this I pulled this from an article which I put in the resources. But when the plasma proteins are deficient, and we're speaking about albumin, specifically, the water in the plasma, okay, the water here it seeps out into the space around the blood vessels and may result in interstitial edema. This is what we see with liver disorders, kidney disease and malnutrition. Or what else if it's not malnutrition, low protein. So, you know, when we have nutrient issues when we're eating food and we're not absorbing nutrients, that is a form of malnutrition. So, albumin also helps transport many substances such as drugs, hormones and fatty acids. So you think about that, it's really keeping the fluids keeping a pressure inside the, the transport, I don't know what I want to say here, but anywhere where where blood is being is carried in any area where blood is being carried. albumin helps keep the pressure there so that nothing leaks out. Loss of albumin will cause leakage.

Unknown Speaker 59:51

Just like loss of salt.

Jennifer Savage, ND 59:56

Well, loss of salt is going to cause dehydration But it won't keep anything at the cell. Same similar Yeah, but not quite. They're going to act in different ways. Lisa says so can fibrinogen also be a part of the

hydration picture? or dehydration picture? It is. It is. Whoever is using video, you've turned that off for me, please. So we don't mess up the video

okay, thank you. Alright, globulins. So globulins, we've talked about globulins. In the past, you all have seen this picture. This picture is the electro for Rhesus which is measuring you can do electrophoresis on a lot of different types of markers. But it's measuring number one, the albumin and two and three are alpha one and two for the globulins. Number four is a beta globulin and number five is a gamma globulin. Now, each one of these things means something different. And, you know, depending on what we're talking about, you know, we can have different levels, hang on a second. We can have different levels of I'm sorry, I just lost my thought. We can have different levels of whatever is in the globulin. So we're testing globulin. And we get that globulin level back at like 2.6. That's pretty optimal. But what if we see it very elevated, what if we see it very low, we can do an electro for recess and be able to see the globby lens on here, and see which one might be raising it up, or which one could be lowering it. And so that's going to be pretty critical, you know, to understand when it's very, very out of balance, but for now we know that it can be an immune reaction, it can be you know, some type of oxidative stress or inflammatory response. You know, if it's on the low side, we know that it could be something characteristic like H Pylori even. So there's different reasons for it. Now, one of the things that I found interesting that I wanted to bring out here for the cholesterol discussion was gamma globulins. These are gamma globulins right here, and number five, are called antibodies and the alpha gamma globulin. And that's why I wanted to make the distinction between this this is the G, the B, and A, a one a two alpha globulins include the high density lipoproteins, HDL, which are important in carrying fats to the cells for building various substances. We know all that. And also for carrying LDL or the beta globulins. So we don't see this in the gamma, the gamma is more related to the immune system, specifically, so what is the I can't even tell you really want I wanted to say about that. But you know, what is the need to know this? Okay, well, because when we look at a globulin level, and an albumin level, this is all going to play a part, especially if we're looking at dehydration. And what does dehydration have to do with cholesterol? Well, let's just keep going because these all tie in together. Now fibrinogen and fibrinogen, is actually a piece of Tiana's case today. So fibrinogen is an important soluble cloud plasma clotting factor precursor, which is converted to a thread like protein called fibrin on contact with a sticky surface. It's blah, blah, blah. What I tell clients how I explain this to clients is with a lot of fibrinogen it is almost like there's a thickness or a thickness to the blood that is related to trash in the blood. So there's a lot of fibrinogen All right. Now let's look at some of the what we just talked about the high values might be caused by many conditions. So we can see high albumin dehydration, high alpha one, infection, inflammation, high alpha two, inflammation, kidney disease, high beta, very high cholesterol. Right there. low iron when we see a high beta globulin and now the only way that we're going to be able to split these up, is to do that electro for Rhesus, that's going to tell us what we need to know. Lisa, I don't.

And I guess one of the reasons is, they I've not seen any that were high enough to truly indicate the need, or maybe the client didn't do blood work with me, maybe they brought blood work with me, and then we, you know, worked through a program and everything turned out fine. Or they didn't have the money to do that. And again, it's not expensive, I think it's a $10 marker. But if they're not going to do bloodwork again, you know, then they're obviously not going to be able to get that. So I never had and

I've only done it a few times never had a lot of reason to do it. In this case, though, I mean, it might be very beneficial for Tiana to do it to get an idea of just what that would look like with the current picture. Alright, so high gamma globulin is going to be inflammation, infection, liver disease and some forms of cancer. Now when we look at low values of these, we're looking at poor nutrition for low albumin because it's a protein. So if we don't have a lot of nutrition from proteins that we're eating, we're not going to see a high albumin and low alpha one severe inflammation, low alpha two thyroid or liver problems. Low beta globulin is poor nutrition. And low gamma globulin out here are problems with the immune system. So there's, there's a lot that we can discover here, right, there's a lot of choices. There's a lot of possibilities. And we don't know which one fits the picture here for Tiana. But that's okay, because we're not interpreting her her blood work. All right now. This is what a person who is fully hydrated will look like when they have a blood draw. So we can see the plasma, the buffy coat, and the red blood cells. Now a person who is dehydrated, the plasma contains the things that we discussed lipids, okay, it contains cholesterol. So that has to be factored in it contains glucose. It contains albumin, it contains urea. So let's make this person be hydrated

that's what it looks like now, we've changed this is no longer 55% This is no longer 45%. Now it's changed quite a bit. So now there are more RBCs in this sample. Because the original like when they drew the blood, it looked like this. Alright, same amount. So they centrifuge it and let it sit and it separates not a lot of water in there. So that means that whatever is in here, oh, and let's add histamine in here. So whatever is in here is going to appear to be less whatever is in here is going to appear to be more I'm sorry, I didn't mean to say less, it's going to appear to be more in here. So Sylvia, as far as cholesterol, it can be elevated. And this is why because we're looking for elevated albumin, we're looking for elevated blood urea nitrogen. So when these are high or even, you know we don't use these as markers but lipids and glucose have to be included in this. So when we see been high and albumin high, then we know that there is some level of dehydration because it is concentrated exactly Gill. Exactly. So more RBCs in the sample due to less water in the blood. We'll make it appear to be higher. I mean, they're showing higher. But if if you only gave them their amount that they should be, we should take out some. And it would appear to be an optimal amount. This is, makes me want to ask for pictures of vials after the centrifuge. Yeah. Yeah, that would actually be kind of cool. So it's concentrated? Yes. Just like the RBCs. Exactly, then.

All right now cholesterol. So there are three main things that I want you to think about here. And we're going to start with the bottom when actually lack of water through the view of hemo concentration also makes the amount of cholesterol in the blood higher than what it may be. Now, it might not be by much. Okay, I don't know. I don't know that there's enough studies around this. But let me let me let me run something by you. And I want you to hear my thoughts on this. Okay, you know how, when somebody says, I'm trying to think you're the best example, but maybe about thinking maybe about fun. Alright, so we see an elevation and been, and that's going to give us an idea of dehydration if we see it really high, or outside of a functional range. But if somebody is not eating enough protein, the button is going to be lower. So what we're looking at is something actually in the normal range in the optimal range. So somebody who has an optimal bun is even more suspicious to me than somebody who has a high bun because with a high bond, I'm pretty much guaranteed that there's dehydration. But if they

have an optimal bun now, I'm curious. I already know this person can't digest food has low nutrient levels, and yet they have an optimal been perfect protein marker, right? So it makes you you know, think, well, now I have to recalibrate or recalculate. And so we can move things that way. But again, when we're talking about the amount of cholesterol in the blood, I don't necessarily know that it's going to move quite like that. I don't, there's just not been, again, enough studies into that. And I suspect glucose, you know, moves up six to eight points. And, again, this is my own understanding. I don't have anything to back that up. But I am paying more and more attention to it. But the other things that we have to consider when cholesterol when we're talking about cholesterol, and we're talking about dehydration. So when the water intake is too low, we're going to see these changes for the example of your body will increase the production of cholesterol, so that it can keep the cell membranes pliable and moist. Okay, so it's alerted. Your body is alerted when there's dehydration, and that's one of the protection areas it is going to happen. Now, if cholesterol is dependent on fluid to get it around the body, because fluid is the vehicle, water is the vehicle, maybe that can cause some interference. When your body lacks fluids, the increase of blood cholesterol levels can be Oh, I'm sorry, can be considered as a perfect example for a change that can happen within your body, the body will then try to deposit the increased cholesterol levels within the cellular membranes of your body, same thing your body does want it wants to make sure that no more water is lost. Okay, this fact has been verified by scientific studies as well. Okay, that's great. Good to know that, right? But it's also good to think about what's actually happening here. We worry about the phospho lipids. Least I do anyway, about the phospho lipids at the cell memory Brain, you know, because the person who is not hydrating well, really the person who's with us that we see this lack of hydration is also the person who has come to us because they have health issues. And they're trying to learn how to heal. Okay, so this isn't the person that is in perfect health and just missed a couple glasses of water. So somebody who has consistently low level dehydration every day, every day,

then we might expect to see cholesterol levels continue up. Because why? Because every single day, that cell membrane is needing to be protected.

Um, let's see, I'm just hitting the chat window, pulled a new set of lead gen says pulled new set of labs up from a client to walk through as we talked about this, and here I am, like, check, check, check. All right, that's cool. That is cool. All right, now, we're, this is where we're gonna, you know, play around with this. So an RBC of 5.1. And let's see, we're not going to use the male part, but

oh, cool, Sylvia. I'm glad you're enjoying it. Alright, so for, let me let me just click on the knees. We'll do a copy

Unknown Speaker 1:16:54

and paste

Unknown Speaker 1:16:59

and paste.

Jennifer Savage, ND 1:17:02

Okay, so we're going to take these three numbers here. And we're going to say, we're going to make this person dehydrated.

And we're going to start off this way. So we don't know much about what the red blood cells look like we couldn't pick red blood cells out over here on the right hand side with just these three numbers, could we? Now this is exactly what we were going through last Wednesday. I believe it was last Wednesday when we were going through some bloodwork and really trying to explain how I was seeing some of the clues. Well, Lisa, I will talk slow until you do. Lisa is switching to her phone. Alright, so when we have these numbers, we can obviously see that there's they're high, right? I mean, that's the first thing we see, we see that they are elevated above the functional range. This one is at the high end of the functional range. So what's the first thing that we think of? Of course, we think hydration, or dehydration? Sorry. You know, because they're elevated. But how elevated are they? Alright, that's a good question. Are they so elevated, that like if this person were hydrated, they would be showing anemia? Are they just a little bit hydrated. So maybe this person is pretty optimal in an optimal range for real? We don't know because we don't know how dehydrated they are right? So we use other things to give us a clue. And part of that is going to be the MCV MCH, MC HC and rd W. Now, let me go ahead and paste a couple more of these in here to get them in here. All right, so we'll come down here with our rd W and our MCH C H or HC. Alright, so now let's just say we have an MCB of 89.

So, what are you picturing in your head that looks like that right? MCV looks good 89 And then the MC hc 27 and our MC, HC 33.

All right, Jen, Jen says, But if they're dehydrated with those actually be lower. What's that? Which ones?

Not necessarily, we don't know where they're. So we don't know what's happening yet. So these could be super high MCV could be 95, MCH could be 33. And MCH, C could be 36. And they could still be dehydrated. Or they can be all low and they're dehydrated. What we're using these to see is to look behind this curtain here, right here, because it's masking the real values of the numbers. So with a MCV, like this, I'm just gonna make this smaller to fit in here better, that's all. Now MCV tells us that it's fairly normal, but the MCH of 27 that is a hypochromic. situation. Hmm. Those at 27, those red blood cells up here, they've got to be small because they are lacking color. So something happening. MCH, see if 33 leaning towards that bottom edge. Absolutely smaller hypochromic. And rd W might be beautiful, at 12.5 is telling us that there's not a lot of variation in the sizes of all the red blood cells in that vial. So if this is 89, and maybe that's a little elevated because of hydration, maybe it's really 87 or 86. MCH is

telling us this is very hypochromic MCH, she is telling us it's very hypochromic. This is telling us your dw is telling us there's a pretty good amount of one size not more than one size but one size of red blood cell then I'm going to think well, then we're talking about us. It's a small blood cell.

So in this case, right here, you know, Lisa's saying so true, let me say so that MCV can be falsely elevated, just slightly Sylvia, I don't think it's it's not in any way affected the same way. The RBC, hemoglobin and hematocrit bar. So no lease, I don't expect that it would be 84. But I would expect it would be showing just a little bit higher.

All right. Now, when we see these, again, plus these we think, okay, there's a lot of hemoglobin, you know, which should be fabulous. There's a lot of inadequate, whoo, there's a lot of RBCs. But the truth is, everything is little. And this is how we know that there is not this amount of hemoglobin. I mean, these numbers by themselves tell you that there is dehydration. But these numbers down here confirm it.

Silvia 1:24:48

So if MCV doesn't really change much in terms of dehydration, or if it does only slightly, then with a number like 89 You would still Even with dehydration, it would still be pretty optimal size was my guess. So in that case, in that case, he would have an optimal size red blood cell. But that's he McCormick, like, like, that's pale. So how does that fit? Because I always I just assumed that the pale is more relating to the small red blood cell size.

Jennifer Savage, ND 1:25:24

That's right. Yep, that's correct. And that's why we might think, you know, that this was 87. You know, 86, something like that.

Silvia 1:25:39

That was a no deal. That would still be a a good size, though. It wouldn't be small.

Jennifer Savage, ND 1:25:45

Right? Right. So we could make this, let's just say this is 87 instead of 89. So now, in this picture, we might suspect, okay, it is 85. It is 84. And it might be small for them. Does that help a little bit?

Silvia 1:26:10

Yeah, I'm thinking. Just, I'm just thinking that when you see pill again, with you see pill red blood cells like that, that MCV, which should be technically lower than that, even with hydration, wouldn't it?

Jennifer Savage, ND 1:26:27

No, no, what if our MCV does not 92. Okay, so now we don't have an optimal. Now we got a big one, a big MCB. And yet, we still have pale cells down here. So we have a B 12. For the sake of argument, I don't want to explore all the aspects of this, but we have a B 12 deficiency. And then we actually have a functional anemia here with the hemoglobin, and it could be an iron deficiency. So with a high MCV. And and let's hear, let me just change these right now.

Silvia 1:27:18

That was my confusion, because I always I, I was thinking that a red blood cell couldn't be that large. When a red blood cell is that large, it has it will be red. I mean, it will be red with a nucleus likely in there. But we're

Jennifer Savage, ND 1:27:33

talking about percentages here. Right? So if there are not a lot of variations, the body can still pick up an average amount of MCV as being 92. But what's the rest of it? Rest of it is small. And we see there's not a lot of variation here. So let me let me just correct these and make these an anemic situation. Or I should say functionally anemic. Okay, so now they're all low. Right? Now that that makes sense that these are pale, because these are low. But MCV is still 92. What if MCV is 95? You know, we, in some cases, we're going to see the MCH be very red. Both of them be very red. And these numbers here will be 32 and 36. And they will support a high MCV that whole picture is right there. And it doesn't change the fact that like if this person was really hydrated, well, they could still have you know, lower hemoglobin. But we are looking to the rd W for that. So what if they're their heme? I mean, they're our dw is 14.5 that's telling us there's all kinds of sizes going on in this sample of blood draw

Silvia 1:29:22

so with a normal rd W or an optimal rd W with all these other dynamics you Yeah, a bit confused. Okay, I think because I think in because one of our last classes I think I asked the same question about the large red blood cell and being I thought it was, you know, could be pale and then I think we went over that no large red blood cells would mean red, but still would that nucleus in there. So this is why I'm I'm sort of confused.

Jennifer Savage, ND 1:29:56

Okay. This is exactly what we went over last time. This is an immature red blood cell. It is large it has a nucleus, it's super red. Here is a small microcytic pale blood cell, it can't carry oxygen. So we can expect B six and zinc and or iron are missing. Alright, we're just going to I'm not going to take any more questions right now. I'm just going to go through a normal. We're going to go through three scenarios and then we'll go into questions. Okay, so here is a normal RBC. Here is a normal hemoglobin and here's a normal hematocrit.

Now, here's an optimal MCV and an optimal M ch. Let's see we'll give that 129 and an optimal MC HC with an optimal rd w, this is perfect picture right here. So they have enough red blood cells, they have plenty of hemoglobin, hemoglobin showing and hematocrit. Okay, now, this person is hydrated, there is no dehydration that we are discussing at the second. So what you see here is the reality of this person. All right, now, let's start right here. Does this picture make sense? For what you see in a really positive good blood tests that make sense for everybody? These numbers. Okay, so what we're seeing is good red blood cells. Good red blood cell color. And good red blood cell color right here. The rd w is telling us there's only one size red blood cell to the optimal size. And we can see that right here. Okay, now let's make this person dehydrated. How do we do that? Well, we increase the RBCs there's going to be more RBCs in that sample because they are dehydrated. So we raise these numbers up

we're not touching these

Unknown Speaker 1:33:32

because

Jennifer Savage, ND 1:33:35

the only thing that we're really looking at here is are these three numbers this is the picture of dehydration. Now when we go backwards and we change them and they when we hydrate this person we give them fluids and salts and electrolytes. Okay, well that's what was hiding underneath of those dehydration pictures so we can see everything looks good. Now let's make them dehydrated again. How else did we know that what was under here probably looked pretty good. Who wants to come on and talk to me about this

Unknown Speaker 1:34:38

so is what you're saying you trust the numbers of EMS. Let's see if MCV MCH MC HC makes sense. You you trust the person is hydrated. Okay. Doesn't like the feeling There's like some trust involved to

Jennifer Savage, ND 1:35:03

rest here. Let's go back to my original question. Yeah. So if you say, Hey, hang on a second, if you see these elevated here, these numbers below here all seem to be optimal. How could we then use these numbers right here the MCV, MCH MC HC as clues to what might be hiding under these numbers here

Unknown Speaker 1:35:41

not a nutrient issue,

Jennifer Savage, ND 1:35:43

right? Yeah. And yeah, so he said to MCV, MCH, MCH, you're good. So there's there's nothing there. There's no nutritional anemias. There's nothing, nothing to be concerned about. Now, why do we do that? Well, because of our earlier discussion, these characteristics, these markers right here are telling us about the RBC and the hemoglobin. So we want to use these characteristics to be able to understand what we can't see here, we can't see these. Because they're hidden underneath the dehydration, they're being masked. So what kind of clues can we use to see this because we can't just throw the report out and say, Well, you know, we can't interpret your bloodwork because you're apparently dehydrated.

Unknown Speaker 1:36:48

Would there be any other reason why the hemoglobin hematocrit and red blood cells are elevated?

Jennifer Savage, ND 1:36:56

Not not for our purposes? No. This is

Unknown Speaker 1:37:01

so you don't get someone who just is like, really? I guess you could look at iron. I'm saying there's no reason. There's no other reason. Okay.

Jennifer Savage, ND 1:37:12

That we talked earlier a little bit about androgens, but I don't want to bring that into this discussion. No, nobody will just for any other reason have higher levels of RBC, hemoglobin or hematocrit, the most likely reason will be dehydration.

Okay, now, let's change this up a little bit. Let's move MCV down to 80. Let's move MCH down to 26. Let's move MCH C down to 30. And we're going to leave our DW at 12. Remove these little guys over

here because they aren't representative anymore of these numbers. But what we're going to do is we're going to make this still a dehydration picture.

Okay, now, just look at these top three. Yep, good. Nanea Nina. Look at these top three. They look beautiful. They're beautiful. And you're thinking this is great. Until you look down here. These are the MCV This is the mean corpuscular volume, it's low. MCH is going to determine color. It's low.

Let's see first Soviet dehydration making them falsely elevated normal. Yeah, exactly. Jen says I'm looking at labs right now. She has a few markers of dehydration and hemoglobin. Holy moly hemoglobin at 10.9. That's pretty low. And hematocrit at 32.7 Cheese RBC is 3.59. Yeah. Okay. That's very low. So we are allowing the MCV, the MCH MC, HC, to tell us about these red blood cells. Alright, so let's just illustrate what they're telling us that the MCV is little. Okay, so let's, let's say that it's little, the volume is small. The MCH is hypochromic. Hi, Bo Pramukh. It's pale. Same with the MC HC pale. And lastly, but most importantly, the rd w is telling us most of these red blood cells are the same size. So they're all most of them. And I don't have a percentage, I don't know. But most of them are small volume and pale.

Unknown Speaker 1:41:13

So would that be it's either chronic nutrient deficiency versus something more recent or?

Jennifer Savage, ND 1:41:20

No, you cannot put chronic in here in this discussion. Right.

Unknown Speaker 1:41:24

Okay. All right. So then destruction is?

Jennifer Savage, ND 1:41:33

Yeah, but what it is telling us is that underneath of these numbers that look so beautiful, there is not enough hemoglobin. We know this because the MCH and MCH si are telling us there's not enough hemoglobin in that sample to present hemoglobin of 13.5. This must be dehydration. The MCV of 80 There's not enough volume in there to say that this is a solid red blood cell. This must be dehydration.

Okay, now, does that make sense to everybody? I? I don't I hate when I say that? Because it's not that it makes sense to you or not? Have I explained it in a way that has illustrated this?

Silvia 1:42:32

In this case, it would be dehydration and nutrient deficiencies.

Jennifer Savage, ND 1:42:35

Yeah. Okay, exactly that. So we're missing something. So in reality, we have hematocrit, that's probably 37. Under hydrated conditions, a hemoglobin that is probably going to show it to 12.5, maybe under hydrated conditions. And an RBC that would probably, you know, show a little bit less than that under hydrated conditions, leading us to believe that there was a nutrient deficiency now, in most nutrient deficiencies, and I don't want this to be confusing. But the RW is probably going to be a little bit elevated, because you're going to have more than one size. And the this is the case when we see the high MCV, of 95. And yet, we have these really lower end, MCH, MCH, see. And then we have an RW, you know, like 14. So this the whole picture, and this up here is like all skewed wacky. So the whole picture is telling us we have big red blood cells, and we have little red blood cells. This is what the picture looks like when you don't have B 12. And you don't have iron. If you don't have iron, and you don't have B six, you don't have copper. You're not going to make one big red blood cell. You will create very big red blood cells with the deficiency of B 12. You also have a lifespan of 120 days, a lot can happen in four months. So we have in that sample, the blood draw. We have some red blood cells that are telling us they didn't get enough B 12 Because they're way too big. And then we didn't get enough nutrients. To the rest of them because they're way too small. Now, this picture, again, would look something like this. MC hc i, it has a tendency to follow MCV a little closer. So in this case we might continue to see. And let me just I'm going to raise this up to 28, we might see MCH on the lower end of its range, we might see MCH, see even towards the higher end supporting that higher MCV. So this would no longer be pale, it would be very big and hypochromic, hyper chromic. Be sure I say that right. But the MCH is telling us they're still it doesn't matter, it doesn't matter if you have big red blood cells, you can still have little red blood cells that are pale because of other nutrient deficiencies. So this is like a map, you know, oh, look, they're low and B 12. There's the big red blood cells right there. Oh, look, they're low and B six, because they have a GGT of six, and all their liver enzymes are below 10. So they don't have B six, well, if you don't have B six, you're not going to be able to build red blood cells.

Silvia 1:46:38

So if we have normal red RTW here in this case, would we look to the MCV? To see, what's the majority in terms of the what's the main component of the size?

Jennifer Savage, ND 1:46:50

That's a good question. We won't typically have a normal rd W in this case, typically, it's going to be above 13. Okay, and we can't really get percentages from it, we just know that there's a variability. So you're not typically unless there's maybe a destruction problem, you're not going to see nutrient deficiencies that are below 13. So we'll even call that like 13.2. And that's enough out of that tight little range, to say you've got too many varied sizes there. But we're understanding that we have these

variables in sizes because we have one that's telling us we've got big ones, and we've got one that's telling us that we've got littles and then you know, we go to the hemoglobin and the RBC. And, you know, in this case, I mean, these could be anything but if they are really low and this MCH is is 28, if I saw an MCH of 26 here. My first suspicion is that I mean, this is oxygen getting carried around the body, and there's nothing to carry it. And that MCH is telling us that, that there's a whole bunch of loss of hemoglobin. Now, let's come back up here real quick. The average amount of hemoglobin in the red blood cell, a cell. If we look at this, and it's telling us that there there's like hardly a percentage of hemoglobin in that cell, then there's no hemoglobin. It's that's it. It's that simple. So I have to believe when I'm looking at something that low and MCH that low that hemoglobin is going to be probably on the 11.5 12 scale. And I'm guessing, I don't know that for sure. But I know that they're dehydrated. If that hemoglobin looks optimal, or high, they cannot be not not dehydrated with numbers like this.

Silvia 1:49:25

So with a high rd W in this case that we're looking at, you would have you would have a combination of large red cells and small white light pale cells.

Jennifer Savage, ND 1:49:37

Yes. Okay. Pale Red blood cells. Okay,

Silvia 1:49:41

I'm starting to get it here.

Jennifer Savage, ND 1:49:43

No, you got it. You got it. Um, I needed to start over at a very normal place and what does optimal look like? You know, before we got into some of the patterns and that's why wanting to move this way instead, I thought might be a little bit better. Um Let's see, I want to hop over to the wind chat window real quick. Gail says this would be more nutrition deficiency instead of dehydration, that it's not a choice. Um Let's see, Gail, I want to talk this through with you. So hop on with me if you can, okay. Okay, so if we see, let me just undo that last move that I made. Alright, so we're looking at this optimal inadequate optimal hemoglobin optimal RBC. Right? All right, and you're asking, Okay, so this is more nutrition deficiency instead of dehydration. We can't compare those two like that. This is the whole thing is a nutrient deficiency. But part of the nutrient deficiency is being masked behind the dehydration. So it's not a matter of more or less dehydration. It's just the fact that if dehydration exists, it will skew these RBC, hemoglobin and hematocrit numbers to a place where you can't see what's behind them. What if we, like what if we did this? And bring that to the front? What if we did this? And you can't see anything? But these three numbers? What will that tell you?

Unknown Speaker 1:51:58

Well, they look normal. looks normal. Okay,

Jennifer Savage, ND 1:52:03

it looks normal. But you know, you're only getting part of the story.

Unknown Speaker 1:52:08

Right? Now I do. Yeah.

Jennifer Savage, ND 1:52:15

Okay, so if we move this somewhere off the screen, it's too big. Okay. So if we move that we have markers here, that can help us understand what's behind each one of these markers, or doors. So I look at these like in my head, I visualize these as just doors that have numbers on them. And I haven't been able to open the door yet for each one of these. So these doors are telling me there is optimal red blood cells, hemoglobin and hematocrit. But then I hopped down here. And I see that there is a huge amount of mean corpuscular volume. So there's a bunch of big red blood cells. Right. So that's a nutrient deficiency. Right? But that doesn't tell me how much hydration is there or dehydration? Right. Right. Right. Okay. And then I look at the MCH, and I'm saying but wait a minute. We have all these big ones. There should be plenty of red going on. Oh, okay. Well, MCH, see, tells me there's plenty of red with 34. And in most cases, it's going to follow whatever the MCV is doing. But MCH won't. So this is the the amount of hemoglobin that's present, right? In each cell, and this is telling us is a very small amount. Well, that's not true for this. This has plenty of hemoglobin. As a matter of fact, that's kind of the whole point here. This, this started off as a very pale cell. And as it's growing, it needs the B 12. And the folate for that nucleus to shrink. And then you know, it's gonna leave it red and large. Okay, so that is also what we're seeing here. But on the other hand, it can't be pale. There's only two ways that cell formation can go. And this is how it's supposed to go starts off pale, follow nucleus, it gets smaller and smaller. All of our nutrients are brought in they interact. The nucleus is kicked out It becomes a ridiculous sight and then an earth recite. So it's beautiful, it's read, they're all formed at the same size. So the only two options we have with a nutrient deficiency are that, that doesn't happen. Maturation doesn't happen and it gets kicked out really big and red or there are again, loss of nutrients. But there's there's no hemoglobin. There is no heme, there's no iron in here. And just as a side note, and if if you all want to get into this discussion later, we can. But one of the ways that we're able to tell the difference between the B six and the iron deficiency is obviously if we have an iron panel, that helps, right. But if we have a lot of iron hanging out, and we see it on that, that panel, we might not know about the B six, but we might consider that this is a B six deficiency, since there's so much iron, because B six is one of the first nutrients into this process. Iron is one of the last. So iron has to be attached to finish creating this heme. And without it we don't as it says right here, it lacks any oxygen binding properties because there is no iron in it. So even with a B six deficiency, it's not like it's full of iron. So there is no B six, there is no zinc and there is no iron in a in a cell like this. It has no capabilities of doing its job. And when we

see an M ch of 26. There have to be red blood cells within that sample that are not capable of carrying oxygen and doing their job.

Unknown Speaker 1:57:05

Okay, okay. So it would almost be more beneficial to look at the MCV, MCH, and MC HC first, before you consider the RBC and hemoglobin and hematocrit. Right?

Jennifer Savage, ND 1:57:24

Oh, I mean, you can look at either one first. I look at the RBC first, because it's the first one in line when I go down the blood work. And I just gather information, I just start looking at the numbers and getting a feel for what they're telling me. If I see anything, you know, well over these ranges right here, then I just know that there's dehydration. And then I look at these, and then I see Well, what else are we seeing here in this picture? So

Unknown Speaker 1:58:04

okay, oh, hell, yes, I'm getting it better. Okay.

Jennifer Savage, ND 1:58:09

All right. Over in the chat window, Tiana says do you look at these blood cells first for clues to dehydration versus been sodium, potassium and protein? And then if you see signs of dehydration, then consider the others are likely lower. Yeah, and that can be like a really funny process right there Tiana. And why I say that is because this is going to the RBC, the hemoglobin and hematocrit being elevated are going to give us our best clue for dehydration. If we're looking at the button, as I illustrated earlier, if this person has a real issue with protein and with absorbing protein, then they might not have a very high bun, what if they're a vegan, they might not have a very high bun. So what does dehydration look like in that picture? Well, if the bond is supposed to be between, you know, 12 and 17, I think it is and they're at a 10. Maybe they're really at a six, you know, but attend for them is the illustration of dehydration. On the sodium and potassium, the only clue I get sometimes on that sodium potassium with dehydration is the potassium. So I might see potassium at you know, 4.7 4.8 and the sodium is 141. Well, that's too far apart. They should be you know, more 141 and 4.3. That to me is a beautiful picture of those two So when I see the potassium skewed way higher, I know that there is dehydration there. And then we have to, you know, turn those numbers into something that makes sense, because if it's raised up due to dehydration, then likely we're seeing a very low sodium. And yes, then that indicates some type of aldosterone issue. albumin is another one, albumin, it's going to respond to the protein that we eat. So a really high albumin, a really high bun, from somebody who is doing a good job of absorbing protein is going to be you know, over five and over 17. But if this person has a protein issue, and their albumin is, you know, should be between four and a half and five, but if their albumin is sitting at 4.1, in the perfect condition, and maybe we see it on the blood test it like for 4.5, we would think, Oh,

that's optimal. But if they're dehydrated, it's really probably less than four. All right. And let's see. Now, let's take any questions. Let's take any questions that want to move these around as examples and what would we see?

Unknown Speaker 2:01:45

I have a question. Hey, really?

Jennifer Savage, ND 2:01:47

Hi.

Unknown Speaker 2:01:51

So, so in this particular picture, because I got confused earlier, a little bit GMCH? Is it possible to be 2829? In this scenario, we changed it a little bit. So we lowered that. Yeah, but it was a little bit, so. Okay.

Jennifer Savage, ND 2:02:17

Okay, what's your question?

Unknown Speaker 2:02:21

So, so where do we start getting suspicious then? Because that doesn't look? Okay. I mean, we could say it's a little bit on the lower end of the reference range, but it's not terrible. It's not outside of it. It's, it kind of looks okay, so. So this is the bed that I got a little bit confused earlier. While we're talking. So when do we how do we start suspecting

Jennifer Savage, ND 2:02:56

are 29 to me is going to still be on that low end. Okay, so maybe not, you know, as many pale small cells, maybe more big red blood cells. But then I'm going to look at the rd w. And if this one is, let's just put it at at optimal 12 and a half. Okay, so there's not a lot of small cells there, maybe. Because it's telling us we don't have a lot of variation in the sizes. So they're, they're more all one size? Well, what would be that all one size? Well, the test is telling us that it's big ones. So if we had to pick one size, that most of the red blood cells were, we'd suspect big ones. With this number here, right?

Unknown Speaker 2:03:58

Yes.

Jennifer Savage, ND 2:04:00

Okay, now. If this were 14.5 Right there, there's no other thing that we can think then Right? There are many different sizes of red blood cells. So we know we have some big ones. For sure, yeah. But then we also know we do have a good amount of smaller ones.

Unknown Speaker 2:04:27

Right. But if that W. W. If that's not a kind of obviously elevated, this is where I kind of I'm getting confused. A little bit. Like what's the clue?

Jennifer Savage, ND 2:04:43

Yeah, consider anything 13 and above, because it's regulated. Yeah. 13 13.2. It's all significant.

Unknown Speaker 2:04:52

But 20 12.5 is very optimal. It's kind of Yeah, it's not necessarily giving us So does that mean that we definitely have big red cells? And then how do we know that we have potentially paler smaller cells? If if GMCH is also not super low, or

Jennifer Savage, ND 2:05:24

go, it's 29. So we know that there are these pale cells?

Unknown Speaker 2:05:28

Do we like for sure? Do

Jennifer Savage, ND 2:05:30

we know for sure.

Unknown Speaker 2:05:33

So we wanted a little bit higher. Okay, they should really change the reference range as

Jennifer Savage, ND 2:05:42

well, again, it's, it's very tightly regulated. So if you're seeing it at 30, then you can suspect there might be less, again, do not lose sight of the fact that there is a four month lifespan to the red blood cells. There could have been a time where there was nothing but little cells in here and they change their diet. And then they changed their diet and cut out all their B 12. Okay, and so all of a sudden, they just started creating poorly matured cells, big ones, but you still have some of these hanging these smaller ones hanging around. They haven't haven't passed off yet.

Unknown Speaker 2:06:27

Okay, so we'll do one DMCA, to be around 13 above ideal. Yeah. Okay. Okay, that answers the question. Thank you.

Jennifer Savage, ND 2:06:36

And it's not a matter of ideal on these particular numbers. They're just telling us the characteristics. So we're not looking for an ideal, we're just needing them to give us information.

Unknown Speaker 2:06:50

Yeah, I suspect, where I'm getting confused is that I just look at 29. And I don't see it as a huge problem, or as a huge, not a huge problem, but like, it's a huge clue, maybe. And at the same time, I need to, because, you know, 29 So that's a new piece of information. Okay, for me, yeah. Cool. Thank you,

Jennifer Savage, ND 2:07:19

Elizabeth, they are a rolling lifecycle. I mean, they all have the same lifecycle, technically, things can happen to cause destruction sooner, and everybody is different. So some, some people, they their red blood cells, you know, have a normal lifespan to span of 100 days, or some people have a normal life span of 110 days. So somewhere between that three and four month mark, is going to be pretty typical. Sometimes they can last longer. And you know, if you have blood cells, red blood cells that are hanging around longer, then this is where we might suspect that that is happening if we see a fairly optimal insulin and glucose but the hemoglobin a one C is elevated. For what reason? Well, that has to do with the red blood cells. Um, Gail says, Could you take into account bilirubin? In what way Gail?

Unknown Speaker 2:08:34

So isn't bilirubin when you're getting rid of red blood cells?

Jennifer Savage, ND 2:08:42

For this, but I mean, how do you mean take it into account?

Unknown Speaker 2:08:44

I have high bilirubin in your on your blood test? Would that mean that you're getting rid of the blue red blood cells quicker, more red blood cells more quickly?

Jennifer Savage, ND 2:09:00

Well, you might be able to use it. But if they're not dying off, then you might not be able to see it.

Unknown Speaker 2:09:08

Okay, I was just thinking, if that would if you would think about that in your contemplation on dehydration. You know, if you were trying to see a pattern for dehydration,

Jennifer Savage, ND 2:09:25

um, I don't typically use that. But it's it's good exploration. I would love to know if you don't go down any rabbit holes now. Okay, I'll tie a tie a rope around your waist and cable you back. Okay, but I'd love to hear if you can tie that to anything and share that with us. Okay. Oh, a bit deeper. Yeah, yeah. I mean, I know what you mean about the one side I just don't know about The other side where red blood cells are not dying off, I don't know that we would see a change in that. The other thing that we have to consider when we're talking about bilirubin is most of the testing is only giving us a total bilirubin. So we're not seeing the indirect or the direct. And that's where we're going to find most of our clues. And unfortunately, when we only see a total, we're not seeing the mechanisms, it would be just like, if we only saw total cholesterol, and didn't see anything else. And we just wouldn't have the the data there for why we have that number. Alright, Jan, hey, Jan. Says so if someone's MCV is 88.6, and MC HC is 29.9, which to me is bordering on 34. Really. MC HC is 33.8, which is bordering on 34. And our dw is 13.1. Would this be optimal or dehydrated? We'll see. I can't get dehydration from any of those. I can only get dehydration from the RBC, and the hemoglobin and hematocrit. So if you have those, go ahead and pop them in the chat window and we'll look at them to

Unknown Speaker 2:11:23

I have those. I'll put those.

Jennifer Savage, ND 2:11:26

Oh, okay, you're on the you can hop on you can just tell me what they are.

Unknown Speaker 2:11:30

RPC is 4.31. Okay. And her hemoglobin 12.9. And the madaket was 38.2.

Jennifer Savage, ND 2:11:50

Okay, so the RPC and let me fill those in again. If you will give those to me again. 4.1. Right on the RBC. 4.3131. Okay. All right, because I want everybody to see this. That's a good RBC number. And hemoglobin we have 12 point what?

Unknown Speaker 2:12:15

globin was 12.9

Jennifer Savage, ND 2:12:19

Okay, and hematocrit

Unknown Speaker 2:12:21

was 38.2.

Jennifer Savage, ND 2:12:28

Okay, now we have an MCV of 88.6. And an MC H 29.9. And 33.8 and an RD W. Of 13.1. All right, now who wants to interpret this? Who wants to be in the hot seat? And give this a try? Jen ricasso.

Nobody wants to try it. Okay.

Unknown Speaker 2:13:27

He was dehydrated. That was my feeling. But I could be wrong.

Jennifer Savage, ND 2:13:34

Well, you know, if you know this person, and you know that they don't drink much, and or they have a condition or even a medication that would be acting as a diuretic, then yeah, that's a part that you know, that we're not seeing here. But looking at these numbers, I don't know how you would pick out dehydration from these.

Unknown Speaker 2:14:04

I think that RBC may be a little bit higher than one.

Jennifer Savage, ND 2:14:17

It looks higher, doesn't it?

Unknown Speaker 2:14:19

Yes. But this size of the cells are smaller. And hematocrit is low. So it doesn't look like dehydration. It looks more like microcytic anemia to me.

Jennifer Savage, ND 2:14:42

Those to me too. I'm not seeing any, any real signs. I'm not getting any impression that there is any dehydration here. And I will say one thing There is an IC O, I see what you're putting in the chat window, want to come right over to that. But this 4.3 When we have a lower hemoglobin like this at a 12.9 and a lower hematocrit, then I'm asking myself, why do we not have a lower RBC? And was it raised up because of maybe just a little dehydration? and Soviet touched on iron deficiency, that hemoglobin is low, I don't care how you cut it. And very possibly, this is iron deficiency. And the only way we know is through other markers. We cannot tell. Just with the seven markers here, we can't tell what the nutritional deficiency is. But we know it's there.

Silvia 2:16:03

Could that red blood cell be higher in this case? If it was iron deficiency? Because is, could it be possible that the body the body's efforts of trying to make more increase to get more basically to get more oxygen, that it would increase its red blood cell? Is that Is that even possible?

Jennifer Savage, ND 2:16:23

That's a good point. That's a really good point. It's possible? I'm going to have to look into that too. To see what, what the what the likelihood of that would be. So that's a very good point, we're going to explore that.

Silvia 2:16:45

Could you see that too? When you have a case of say, somebody who goes to high elevation? Yeah, to mountains that they could, I could see that happening, the body's trying to get more oxygen, so it would increase it. So like it's production?

Jennifer Savage, ND 2:17:02

Yeah. And but we would see it across several numbers, not just one. Right? Um, but see, then then you make me question if it were high altitude, and these are stationary numbers. And this was too high, well, then this is too high.

Silvia 2:17:22

Well, could that be the case of high altitude and iron deficiency? So it's like the body's trying to make red blood cells, but it doesn't have that Iran present to make more hemoglobin basically. So it could be a combination of both?

Jennifer Savage, ND 2:17:39

It's always possible. Yeah. It's always possible. But like I said, when we're looking at one, we're really looking at three. So if one is too high, the others are raised up for whatever reason, that is, and meaning, so let's back out of this, what if her RBC is elevated, and these two are elevated, so she still has some kind of iron deficiency or B six deficiency or something, but maybe this is 11.9, not 12.9, maybe this is 37, not 38. Maybe this is, you know, 3.9. So if they are falsely elevated due to any reason, then it's going to affect you know, the way the other markers are represented. See, the thing is that even if this goes up this RBC, there's still an amount of hemoglobin present, it's going to have to correlate with that somehow. So that's really what we're looking at. Alright, Nina says, My experience with Colorado clients is very high MCV. Yeah. Yeah, we'll have to get an answer to that one to see I love all the questions that you bring. So yeah, these are insightful and are going to add to our actual understanding, not just things we hear, right? But actual facts and actual truth in how we can use this information to understand a blood chemistry.

Silvia 2:19:31

I'm always thinking and then it's too much because then I can't sleep because my brain doesn't shut down. Like what happened last night? I was not sleeping. I was just like, just things in my head round and round and round all night. That's crazy. Yeah. Yeah. Shut it down. At some point, give it a break.

Jennifer Savage, ND 2:19:50

Oh, I know. But I've run into the same issue where I'm hopping up. You know, I'm waking up at 11 and I was dreaming about something in the health world. And then I have to explore it. I just have to know right then I'm not going to sleep. So yeah, I'll get that. Um, yeah, Lisa, you got another example. Bring it on.

Unknown Speaker 2:20:17

Okay. Um, this person has a RBC of 4.51 and hemoglobin of 14.1. So both of those are slightly high. But the Amana crit. That's 14.1. Yep. And but the hematocrit is 41.

Jennifer Savage, ND 2:20:36

Okay, is this male or females? Female? Okay.

Unknown Speaker 2:20:41

MCV is 91. And MCH is 31.3. MC HC is 34.4. And our dw is 11.8. Okay.

Jennifer Savage, ND 2:21:00

So what is the our DW telling us right this second?

Unknown Speaker 2:21:03

They're all about the same size. Yeah.

Jennifer Savage, ND 2:21:06

So that's one thing that we can count on. There's not a lot of variations. All right, now, let's start with RBC, hemoglobin and hematocrit. So we know that hemoglobin is telling us it's a little elevated. And RBC is a little elevated. Nomadic, that's not, that's okay. We'll just let it be what it is, we don't have to force anything to be anything, it's not. But these are definitely elevated. So what are your suspicions around this?

Unknown Speaker 2:21:43

For this person in particular, she was drinking a ton of water, but I actually think it was like a cellular hydration issue. Um, so I don't, I think it was not having enough electrolytes. So I think that there is some dehydration.

Jennifer Savage, ND 2:22:00

And it could have just been before the test, right? Mm hmm. And maybe not fully. And we cannot completely trust the hematocrit there when we're looking at hemoglobin levels. So when we're looking for a functional anemia, we want to focus on that hemoglobin be above and beyond anything else. In this case, though, the hematocrit is very optimal. And so we might suspect, you know, that we're just seeing that little elevation only in these two MCV is 91. That's not horrible. I mean, I know that 90 is the cutoff. But 91 isn't just like jumping off a cliff. These are red blood cells. We're looking at a picture of a, you know, a four month window, and that was Elizabeth put it that rolling number. So when the test was done, that was a snapshot, right then of the last four months. And we've had sorry, we saw with her MCV. It just wasn't that high MCH, see. on the higher side, you know, so we know that those are red. And MCH see on the higher side. So we know that those are just probably slightly red are more red than than they should be following the MCV, so maybe a little extra redness. And maybe the rest of her cells are. There's not a huge variation between large and small. So let's just say there's large and optimal size. Not a big variation there.

Unknown Speaker 2:24:04

It's these more subtle ones that sometimes throw me because I don't want to read too much into them. But I also want to pull out what is valuable. And so would you think like, if this person doesn't for example, eat all that many vegetables? Could this be connected to say folate? Or you know, iron or be sex or copper? If that fits with the rest of the story, or are you looking at this and saying it looks pretty good to you

Jennifer Savage, ND 2:24:34

know it, I mean it it looks better than most, but there's still a clue there with the MCV there's a little high. So considering that the rd W has a lack of strong variation. Then I'm assuming that maybe they they had some days they did better with their nutrients than others. I would absolutely address you know, be 12 and folate. And again, folate is one of those we're going to the leafy green, we can control the leafy greens. And that might change it, but do her symptoms indicate at all that b 12 or folate are giving her issues? And at 91, we might not see very much. So these are very subtle. I do think that there was probably some dehydration around the the lab work. But here's a question. And this is for the group. The question in my mind is, if a body is not fully hydrated, now, they, you know, you slept all night, you got up and you didn't have anything to drink, that should show some dehydration. But it shouldn't show a lot, not for a body that's fully hydrated, which is something we have to keep on all the time. So if somebody drinks a glass of water before a test to get hydrated, I would also always make sure that they added salt so that that water is actually absorbed to the cell. But in this case, Lisa just looking

at these numbers, I'd say okay, they didn't hydrate before the test ematic or it looks okay. MCV at 91 is a little elevated. So consider something happening with the nutrients. And these are all you know, higher end but certainly within the range. Our DW finishes the story with there's not a lot of variability. Now if rd W was at 14, then there's something here we're not seeing. Right. Okay, but rd W and rd W doesn't mean better lower. It doesn't mean anything lower. I have explored this until I don't know till I've run out of hours and a low rd who doesn't mean anything. So we'll just leave it at that. All right. Anybody else have any questions on that?