I’d like to welcome you to the 4th session of Smilo shares with primary care. This is a series of talks that we think will be of interest and importance to our primary care colleagues as they are taking care of patients. And trying to best understand indications for referral and what happens when people are referred to the Smilo Cancer Center, which is such a valuable part of our health system. These talks are targeted towards primary care and the faculty panel.
has rotated on specific to the specialty of the talk that’s being addressed and today’s topic is anemia. There are many other venues for education for primary care clinicians and we know your time is valuable, so thank you so much for joining. Just for convenience, these talks will always be monthly on the 1st Tuesday from 5 to 6 and there is a master schedule and we’ll show you at the end the previews of the next sessions. These sessions are recorded and NE Medical Group clinicians can find those on the clinician website.
under that and we will send out a link afterwards to all of those who attended. At the end of the session there will be a brief survey and please stay tuned for that.

This is the schedule we will move shortly into case presentations and then the best part of these sessions is the question and answer. As you hear the presentation, please use the Q&A field to queue up your questions. We will stop briefly after each of three cases to address the questions pertinent to the case and then have some open discussion at the end.
I’d like to introduce our speakers on the left, Bob Bona, who’s the director of the benign hematology program and the medical director of the Hemophilia Treatment Center at Yale. He’s originally from New York, and he and his wife Georgiana, are current residents of New Haven and longtime residents of Connecticut, where they raised their three children. Prior to coming to Yale, he was a founding faculty member of the Frank Netter School of Medicine at Quinnipiac University. Prior to that, he was a professor of medicine.
00:02:41.534 --> 00:02:43.388 at the UConn School of Medicine, having trained there and at Saint Francis Hospital in Hartford.

00:02:48.510 --> 00:02:51.457 He did serve as the hematology and oncology fellowship program director, chief of the Division of Hematology and a hemophilia treatment cancer director.

00:02:59.390 --> 00:03:01.686 He has a strong interest in his career in medical education and is a graduate of SUNY Upstate Medical College in Syracuse.

00:03:09.370 --> 00:03:11.910 Skills on broad display here.

00:03:11.910 --> 00:03:15.288 And Anna Crest received her medical
degree from Columbia University.

Vagelos College of Physicians and surgeons,

her internship and residency were

completed at Columbia University,

New York Presbyterian Hospital.

After residency,

Dr Crest completed her fellowship

at the Yale Cancer Center and served

as a Chief fellow in her third year.

Her clinical and research interests

include various topics within

classical and malignant hematology.

Frank Ciminello is an internist in Trumbull,

Connecticut and has over 20 years of.

Experience in the medical field.
He graduated from NYU School of Medicine and completed his residency in Internal Medicine primary care at the University of Pennsylvania. He also has an MBA from the Yale School of Management and currently serves as both a Regional Medical director for Northeast Medical Group in the Bridgeport Region and also as the President of the Primed Medical Group, which is a PSA group within NE Medical Group. Kelsey Martin, our final panelist, is an assistant professor of clinical medicine at the Yale.
Cancer Center and Cares for patients at the SMICO Cancer Center.

In Orange, CT, she received her medical degree from the Royal College of Surgeons in Dublin and completed her residency in internal medicine at the Jacobi Medical Albert Einstein College of Medicine in New York.

She subsequently completed specialty training in hematology and medical oncology at Lenox Hill Hospital in New York City.

Doctor Martin’s clinical interests are patient communication,
NOTE Confidence: 0.959529158333333
00:04:49.730 --> 00:04:50.321 hematology,
NOTE Confidence: 0.959529158333333
00:04:50.321 --> 00:04:52.685 hematologic disorders in women’s
cancer prevention,
NOTE Confidence: 0.959529158333333
00:04:52.685 --> 00:04:53.867 including the role of nutrition.
NOTE Confidence: 0.959529158333333
00:04:53.870 --> 00:04:56.430 Obesity and an environment in cancer
promotion.
NOTE Confidence: 0.959529158333333
00:04:56.430 --> 00:04:59.154 Doctor Martin is actively involved
in the Yale community as a member
NOTE Confidence: 0.959529158333333
00:05:01.415 --> 00:05:03.857 of the Status of Women in Medicine
NOTE Confidence: 0.959529158333333
00:05:03.857 --> 00:05:05.866 and the Women Faculty Forum.
NOTE Confidence: 0.959529158333333
00:05:05.866 --> 00:05:07.689 With that said,
NOTE Confidence: 0.959529158333333
00:05:07.690 --> 00:05:10.936 I think you have a lot of learning
NOTE Confidence: 0.959529158333333
00:05:10.936 --> 00:05:13.816 in front of you and I’m going to turn
NOTE Confidence: 0.959529158333333
00:05:13.891 --> 00:05:16.187 to over to our panelist to begin.
NOTE Confidence: 0.959529158333333
00:05:16.190 --> 00:05:16.610 Frank,
00:05:16.610 --> 00:05:19.970 do you want to introduce the first case?
NOTE Confidence: 0.959529158333333
00:05:19.970 --> 00:05:21.059 Thank you and.
NOTE Confidence: 0.871126412
00:05:23.510 --> 00:05:24.940 Well you just put yourself on mute
NOTE Confidence: 0.8514667645454
00:05:25.750 --> 00:05:28.498 I muted unmuted and muted again
NOTE Confidence: 0.8514667645454
00:05:28.498 --> 00:05:30.850 myself so sorry about that.
NOTE Confidence: 0.8514667645454
00:05:30.850 --> 00:05:33.258 So we have three cases I'll I'll
NOTE Confidence: 0.8514667645454
00:05:33.258 --> 00:05:35.916 present them and then each of the
NOTE Confidence: 0.8514667645454
00:05:35.916 --> 00:05:37.851 our our panelists are specialists
NOTE Confidence: 0.8514667645454
00:05:37.851 --> 00:05:40.238 will will help guide us through
NOTE Confidence: 0.8514667645454
00:05:40.238 --> 00:05:42.710 some discussions some work up and
NOTE Confidence: 0.8514667645454
00:05:42.793 --> 00:05:45.264 and and we hope this is extremely
NOTE Confidence: 0.8514667645454
00:05:45.270 --> 00:05:47.340 educational and beneficial to you
NOTE Confidence: 0.8514667645454
00:05:47.340 --> 00:05:50.646 and and your patience and as I'm sure
NOTE Confidence: 0.8514667645454
00:05:50.646 --> 00:05:53.064 you know anemia is extremely common.
NOTE Confidence: 0.8514667645454
00:05:53.064 --> 00:05:55.542 And and it seems as patients get
NOTE Confidence: 0.8514667645454
00:05:55.542 --> 00:05:57.970 older the the chances are the
prevalence of anemia really does increase quite dramatically. So we hope these three cases which we picked from literally a week of my patients a few weeks ago is relevant for you as well.

Case one is a woman 52 years old who is coming in for a routine physical she’s a history of thyroid disease, sleep apnea, diabetes. And you can see her current blood work which showed anemia and the prior year showed a little less severe anemia, but you’ll notice a drop in
hemoglobin and a drop in her MCV although MCV is still normal.
And then, uh,
next slide and there's a routine village.
You had no symptoms at all.
Um, get next slide, please.
I am trying to move to the next slide and it's not working.
I've been having some network problems.
Renee, can you pull up this slide deck?
I'm going to stop. Sharing.
Actually I can try resharing one more time and see if that works.
No, it's not working right now.
Have you? Pull it up.
Apologies for the delay.
Um, oh, there we go.

Alright, so we sent her for some additional blood work and you'll see her iron levels #TABC, which is now high.

Her ferritin is low and her B12 was normal.

She did have a colonoscopy the prior year that showed us a benign hyperplastic polyp and diverticulosis.

And uh, if we can go to the next slide, actually those questions,

Yeah, sorry the.

So I'll hand it off to Kelsey,

but beforehand,

we'll ask Kelsey, you know,

what other tests she would want done
by us or that we should do first and
any recommendations for treatment
and then when we would want to
refer this person to hematology.
Alright, thank you.
Alright. Thank you so much for
the opportunity this evening.
Frank, would you mind just flipping back
to the labs that we did already perfect.
So I think in looking at this case,
I think what jumps off the page
to me right away is that you know
that hemoglobin hematocrit dropped
in about a year’s time span as you
mentioned the MCV started to decrease.
The platelet count was also kind of
heading towards the upper limit of normal and the MCV and I’m sorry the RDW is also starting to increase as well. I think these labs as far really clearly consistent with iron deficiency. The ferritin being less than 30 really is as a number we would look at. So certainly if it’s less than 10, I think that this is clear cut iron deficiency, a retic count I think is helpful just to sort of to show sort of the lack of narrow response. The peripheral smear is always I think useful to in hematology and and I
think actually truthfully I think if
if the patient is not describing significant bleeding or history of bleeding. I may even be content with stopping there.
I think if a patient is giving a history of a long standing history of bleeding, particularly something like a menstrual, bleeding will come into that in a second. And as a hematologist, I do start to think about bleeding disorders as well, things like von Willebrands disease that are common in the population and that can manifest as iron deficiency. And so I actually would probably not do too much more at this point.
I actually think we have enough of a diagnosis to make. So and.

Iron deficiency is extremely common. A significant burden globally and disproportionately impacts children and women.

We can break down the main etiologies or causes of iron deficiency. Most commonly here we're seeing things like chronic blood loss, particularly in a man until proven otherwise and postmenopausal.
women’s menstrual bleeding,
NOTE Confidence: 0.8466977675

00:10:28.744 --> 00:10:32.872 gynecological bleeding and Gu bleeding,
NOTE Confidence: 0.8466977675

00:10:32.880 --> 00:10:35.298 sort of the second sort of
NOTE Confidence: 0.8466977675

00:10:35.298 --> 00:10:36.910 major category be malabsorption.
NOTE Confidence: 0.8466977675

00:10:36.910 --> 00:10:39.532 And this we see commonly I
NOTE Confidence: 0.8466977675

00:10:39.532 --> 00:10:42.142 think in our patients with a
NOTE Confidence: 0.8466977675

00:10:42.142 --> 00:10:44.297 history of bariatric surgery as
NOTE Confidence: 0.8466977675

00:10:44.297 --> 00:10:46.239 obesity and continues to rise.
NOTE Confidence: 0.8466977675

00:10:46.240 --> 00:10:48.263 And also H pylori is another
NOTE Confidence: 0.8466977675

00:10:48.263 --> 00:10:50.046 quite common thing I feel that
NOTE Confidence: 0.8466977675

00:10:50.046 --> 00:10:51.750 we see in the outpatient setting.
NOTE Confidence: 0.758115975

00:10:53.830 --> 00:10:57.318 And then there is sort of another second,
NOTE Confidence: 0.758115975

00:10:57.320 --> 00:10:58.560 third major category would
NOTE Confidence: 0.758115975

00:10:58.560 --> 00:11:00.110 be sort of physiologic need.
NOTE Confidence: 0.758115975

00:11:00.110 --> 00:11:01.886 So you know, periods of growth,
NOTE Confidence: 0.758115975

00:11:01.890 --> 00:11:05.282 childhood, adolescence and certainly
00:11:05.282 --> 00:11:08.778 during pregnancy where nearly half of pregnant women are iron deficient.

00:11:08.778 --> 00:11:10.358

00:11:12.870 --> 00:11:16.909 So we could flip the next slide.

00:11:16.910 --> 00:11:19.856 So we think specifically looking at more pathologic disorders associated with iron deficiency and as mentioned in this patient’s case, she had seen.

00:11:19.856 --> 00:11:21.820

00:11:21.889 --> 00:11:24.385 It was in the last year or two in this case.

00:11:24.385 --> 00:11:28.780 But always important for us to think about the entire job GI tract.

00:11:28.780 --> 00:11:30.356 I think particularly about H pylori again as an NPI, that’s something that we see that

00:11:30.356 --> 00:11:32.326 recent future right played Frank.

00:11:32.330 --> 00:11:36.100 It was in the last year or two in this case.

00:11:36.100 --> 00:11:39.289 think about the entire job GI tract.

00:11:39.289 --> 00:11:43.745 I think particularly about H pylori again as an NPI,
can contribute to or hydria, which can also contribute to iron deficiency.

We sometimes are screening patients for celiac disease as well, I think UM and that it comes up often in our patients who are refractured iron which I’ll come back to in a couple slides.

And then there is a number of conditions as well that we see frequently and particularly in the primary care setting of anemia associated with chronic disease where those patients or maybe have poor utilization of iron and that’s patients with chronic heart failure,
chronic kidney disease and other.

Chronic inflammatory disorders, particularly things like inflammatory bowel disease,
I listed on the right hand side here just a couple of other things I feel that we see often in our practice as hematologists.

So I think food insecurity and sort maybe for access to diverse diet, diet is something that we should probably dig into a little bit deeper with our patients as we take a history.

Blood donation and I have a a number of patients who are those
frequent blood donors you know who
are donating their blood every you
know between 50 to 60 days and and
there’s and they’re saying to just
support those types of patients
should be on oral iron supplementation
to prevent iron deficiency.
So I think again a good history
comes in handy there as
mentioned before gynecologic bleeding
you know iron deficiency again
disproportionately impacts.
And then?
And have you menstrual periods is
is common and so working closely
with our gynecologists can be
tremendously helpful in improving the quality of life of women with iron deficiency and asking about hematuria and other sources of blood loss. And then patients who receive erythropoietin stimulating agents or darbepoetin for example, those patients use up their iron stores over time and it’s important that they are also receiving iron supplementation so important as we look in patients medications to see if that’s playing a role. And we also know by researchers.
from here at Yale that Trimberg for example that there are genetic conditions where some people do not absorb iron adequately and that’s due to inappropriately increased levels of hepcidin which is our master regulator of iron. So we think about that a lot in patients who have been taking Iron supplements appropriately, but are not not achieving an adequate response. Next slide, please.

And a couple of just clinical pearls perhaps are things to consider? An iron deficiency can be due to more than one thing at a time.
And in dual pathology for example, both upper and GI tract involvement is found in about 1 to 10% of cases and with our aging population this becomes more common.

In both males and postmenopausal women, cancer of the GI tract is found about 8 to 10% of cases, which is quite significant. In our premenopausal women, cancer of the GI tract is much less common and heavy menstrual periods would be playing a major role in that case.

Next slide, so for the ferritin is probably the most single most
useful test we can have performed.

And going back to your question about what additional testing can be done and if it’s low which is really characterized by less than 15 and then you’ve already confirmed absolute iron deficiency and that’s why with that prior case I think with a ferritin of three that was very helpful to have an iron saturation of less than 20% is is also another useful. A target and when doctor bonus speaks, I think he’s going to you know make reference to how we interpret situations where patients
may still be iron deficient yet

have anemia of chronic disease.

So, so important to pay attention to that iron saturation,

the peripheral smear can show us classic findings of iron deficiency and the reticulocyte count,

RDW and platelet count are also all factor into my decision making process as I evaluate these patients.

I think in history, I will come back to that in that I don’t think much additional lab work is required,
but I think a strong history taking skills are really useful and asking patients if they're craving ice or being crunchy things. I think it's also very helpful and also quite specific for iron deficiency. And so I asked that often of my patients and other things like restless leg syndrome, cold intolerance which I feel like patients mention often and I do find that patients mention alopecia as a concern should I'll bring our attention to iron deficiency and maybe out of the scope of today, but certainly patients maybe carries a beta thalassemia and it can be
sometimes challenging when someone has a microcytic anemia to help make that distinction. And the Mentor Index is a tool worth the MCV over the RBC Count, which can help us, you know, try to make that distinction. And excited. Something I’ve thought about and I thought maybe others might do is you know should our patients be fasting when we check iron levels and I think it can be, but it doesn’t have to be. It’s how I interpret the data.
I'm not sure if my colleague should answer this but I think that there are some diurnal variations and also some changes after meals that impact serum iron and so our serum iron levels peak in the late morning and increases after a meal. But it also decreases after fasting and so my interpretation of this is that I think it is not crucial to measure iron studies fasting but. Sort of on the flip side, where sometimes we see very high
levels of iron and we’re sending patients to that for hemochromatosis and those patients I will often have them repeat it fasting in that circumstance and it appears that the tsap performs just as well in non fasting versus fasting patients so. Next slide, please.

So our goals of treatment or management of iron deficiency, we want to first and foremost identify and treat the underlying cause of the deficiency and working typically closely with our gynecologist and gastroenterologist colleagues is key.
And maybe less commonly, urology, we want to replete the iron stores and we want to normalize the hemoglobin if someone’s anemic and improve or reverse the symptoms that they’re experiencing. And usually, you know, the craving of ice ships, you know, response quite quickly. And I often remind patients to bring that to our attention if they notice it in the future because it’s such a sensitive sign and the goal is not to keep patients on lifelong iron. And as I’m sure, as we’ve all seen, sometimes it’s a medication that seems to linger on medication.
Lists.
And I think it’s always worth reevaluating whether the patient really truly still needs to be on it.
So. Next slide, please.
So what is the best approach?
Case that patient team was around 9:00 and I think this patient has largely asymptomatic and probably this patient could be managed with oral iron supplements. Patients often I find ask you know can they just eat meat or or make a change and I think that’s is
limited and it’s in its efficacy once

patients are becoming progressively

anemic but but could be considered if

if someone has a normal hemoglobin

but maybe borderline iron levels.

I think it’s that reasonable to to

try and I’ve just listed some some

some foods that are rich in iron

and Anaheim iron from from from meat

or poultry and fish is is absorbed

more efficiently than iron that

comes from plant based sources.

But I would you know certainly

doesn’t have to be what someone

needs if they’re vegan for example.

I think if there’s one thing that
people in the audience want to listen to today is how to give oral iron. And we now have a growing collection of data that tells us that every other day iron supplementation is, and it’s easy to remember about 100 milligrams of elemental iron every other day. I think it can’t go wrong and this
is the reason behind this is. Sort of. If, if there's a really simplistic way is if there's kind of too much consistent iron that hepcidin, which again is sort of our master regulator of iron absorption, starts to impair our ability to absorb further iron, and taking the iron every other day is best. It's also best on an empty stomach, hour before 2 hours after a meal. You know, regarding the rule of vitamin C from from from my understanding.
there’s really no data to sort
of fully make this
I often personally don’t.
I’m not sure if my colleagues
would answer that,
but I never really push for it.
But it doesn’t bother me
if someone’s taking it.
And it really needs to be
continued for a few months.
At least three to six months
after the iron deficiency has
been corrected in order to
to replenish those stores.
So it takes a few months for it to be effective and I would just keep that in mind as again as we make decisions about which patients might need to have. Their anemia improved quicker and as we talked about intravenous iron. Also, a lot of patients can’t tolerate it. You know more. You know, usually GI upset. As a result, there’s a number of different brands on the available. Usually do recommend fair
sulfate because I think it has the most data supporting it, and I personally am weary of slow release formulations because its absorption is passed the duodenum where iron is absorbed. So I’m personally wary that I’d be curious with my colleagues say about that.

We as hematologists offer a lot of intravenous iron. And the patients who I consider it in are largely those patients.
who are either intolerant or sort of failed oral iron therapy. Many of our patients also have malabsorption medical conditions, patients with gastric bypass for example, or patients with inflammatory bowel disease where the utilization of iron given intravenously is much more efficient. As I mentioned, it takes a few months for oral iron to be effective, so sometimes we need to improve things quickly. Maybe someone is going to have surgery or if someone is 34 weeks pregnant and we need to
improve their anemia in a shorter time

frame and I think intravenous iron is extremely helpful in those situations.

It is also common in patients who are with chronic kidney disease on erythropoietin stimulating agents often benefit from intravenous iron. Umm.

We have ways of calculating the iron deficit. That calculation is stated there. It usually ends up being somewhere around 1000 milligrams that someone needs repleted,

and there’s a number of different brands that are available. They. At the end of the day, can I think we choose which brand
00:24:45.262 --> 00:24:51.188 based on patients, insurance and and?
NOTE Confidence: 0.87935176375
00:24:51.190 --> 00:24:52.422 Potentially, how many visits
NOTE Confidence: 0.87935176375
00:24:52.422 --> 00:24:54.270 it might be to the clinic.
NOTE Confidence: 0.87935176375
00:24:54.270 --> 00:24:56.590 Some of them require more
NOTE Confidence: 0.87935176375
00:24:56.590 --> 00:25:00.210 more than one visit. Umm.
NOTE Confidence: 0.87935176375
00:25:00.210 --> 00:25:02.178 There is evolving literature
NOTE Confidence: 0.87935176375
00:25:02.178 --> 00:25:04.846 about the risk of infusion related
NOTE Confidence: 0.87935176375
00:25:04.846 --> 00:25:06.934 reactions that can happen with iron.
NOTE Confidence: 0.809997115333333
00:25:09.560 --> 00:25:10.744 Including our own published
NOTE Confidence: 0.809997115333333
00:25:10.744 --> 00:25:12.520 data that seems to be maybe
NOTE Confidence: 0.809997115333333
00:25:12.576 --> 00:25:14.296 relevant to patients blood type,
NOTE Confidence: 0.809997115333333
00:25:14.300 --> 00:25:16.756 but I think it still is quite rare,
NOTE Confidence: 0.809997115333333
00:25:16.760 --> 00:25:19.020 maybe maybe somewhere around 1%
NOTE Confidence: 0.809997115333333
00:25:19.020 --> 00:25:21.470 of patients have what we call an
NOTE Confidence: 0.809997115333333
00:25:21.470 --> 00:25:23.546 infusion related or which is a
NOTE Confidence: 0.809997115333333
00:25:23.546 --> 00:25:25.256 sort of allergic type reaction.
But for the most part there’s no brand preference at the end of the day.

Next slide, please.

So who should be sent to hematology, I think patients who benefit from IV iron will always happy to see those patients and I think if the patient is having a history with significant bleeding and that includes a heavy menstrual periods. Patients who have prolonged menstrual periods, patients who see clots of blood during their periods, patients who say every woman in their family had heavy periods,
I think it can be very helpful for us to make sure those patients do not have a bleeding disorder. Patients who bleed after pregnancy, these are patients who are frequently missed in their diagnosis and then patients who are refractory to patients who have been taking oral iron appropriately. So again, I just think back on, are they taking it every other day, are they taking it on empty stomach, are they taking it the way we’ve recommended for patients that really are or? I think it can be helpful for
NOTE Confidence: 0.777776185714286
00:26:33.016 --> 00:26:34.472 us to to think outside the box a
NOTE Confidence: 0.777776185714286
00:26:34.472 --> 00:26:36.133 little bit as to what the cause of
NOTE Confidence: 0.777776185714286
00:26:36.133 --> 00:26:37.037 their iron deficiency is.
NOTE Confidence: 0.62390435
00:26:40.560 --> 00:26:43.048 Good. I'll just pop in one of
NOTE Confidence: 0.62390435
00:26:43.048 --> 00:26:45.030 the questions on Katie Reeve,
NOTE Confidence: 0.819223925
00:26:45.030 --> 00:26:49.179 who's one of our EMG internist in the New
NOTE Confidence: 0.819223925
00:26:49.179 --> 00:26:52.136 London region or the Far East region,
NOTE Confidence: 0.819223925
00:26:52.140 --> 00:26:53.980 says other than pill burden,
NOTE Confidence: 0.819223925
00:26:53.980 --> 00:26:56.014 is there a downside to long-term
NOTE Confidence: 0.819223925
00:26:56.014 --> 00:26:57.803 iron that people aren’t feeling
NOTE Confidence: 0.819223925
00:26:57.803 --> 00:26:59.668 side effects are their harms?
NOTE Confidence: 0.736122402
00:27:00.660 --> 00:27:04.240 Well because the there’s no,
NOTE Confidence: 0.736122402
00:27:04.240 --> 00:27:06.784 there’s no real way for our the human
NOTE Confidence: 0.736122402
00:27:06.784 --> 00:27:09.118 body to get rid of excess iron.
NOTE Confidence: 0.736122402
00:27:09.120 --> 00:27:12.258 I do worry about iron overload
NOTE Confidence: 0.736122402

45
and occasionally I think we do. We do see patients who start to have high duration and high ferritin from being on a long standing iron. So I do think, it really should just be done for a fine out amount of time. Alright. And Doctor Zarko Power just points out that chronic blood loss especially angiodysplasia and other GI issues seem to be really common. Sometimes we use the platelet count as an approximator of how acute the bleeding is. Is there any truth to that that people
who have a high platelet count with iron deficiency are more likely actively bleeding than not?
I’m not aware of that.
I don’t know the answer to that.
I feel like we see.
And I actually think so when I did some research that the platelet count is often high in iron deficiency through its own mechanism.
So I don’t know how bleeding offsets that’s why I actually just don’t know the answer to that question.
I don’t know I’ll defer to my colleague.
someone else has a nose of more than
I do but I and I but I absolutely agree with interact with ours about Andrew dysplasia and and and we do have some patients I think that are kind of chronic leaders and and for those patients I think yes they could stay on iron. As long as you're someone's like tracking it and measuring. OK. But. So I'll, I'll take this back. Thank you, Kelsey, very much. And even though I prepared these cases and knew what you're going to say, I still learned three things just now. So thank you. So this woman did have manraka on more directed questioning.
and ultrasound that showed polyps.

She had a GYN who took her surgery. She did well after surgery.

She’s had a normal hemoglobin postop and since still without any symptoms which is great.

So and I think she had just oral iron I believe in the end.

Thank you. I think we answered. Yes, I think we answered all of our questions for case one.

So I’m going to move us through to case two.

So SN is another patient of mine, 76 year old gentleman a little older, 76 year old gentleman a little older,
00:29:47.300 --> 00:29:52.546 prefer all disease Tia, stroke, COPD,
NOTE Confidence: 0.89384889
00:29:52.546 --> 00:29:57.876 chronic kidney disease stage 3.
NOTE Confidence: 0.89384889
00:29:57.880 --> 00:30:01.040 Which is not in there but that’s what
NOTE Confidence: 0.89384889
00:30:01.040 --> 00:30:04.560 he has who came in with the subacute
NOTE Confidence: 0.89384889
00:30:04.560 --> 00:30:07.727 of one to two-month history of chronic
NOTE Confidence: 0.89384889
00:30:07.727 --> 00:30:10.541 dyspnea on exertion that over that
NOTE Confidence: 0.89384889
00:30:10.541 --> 00:30:13.518 time period has been getting worse.
NOTE Confidence: 0.89384889
00:30:13.520 --> 00:30:17.378 Here’s his most recent blood work
NOTE Confidence: 0.89384889
00:30:17.380 --> 00:30:19.571 and I was calculating his GFR by
NOTE Confidence: 0.89384889
00:30:19.571 --> 00:30:21.978 memory but I might have overshot.
NOTE Confidence: 0.89384889
00:30:21.980 --> 00:30:25.326 But you can see he is anemic
NOTE Confidence: 0.89384889
00:30:25.326 --> 00:30:27.634 hemoglobin of nine his ferritin.
NOTE Confidence: 0.89384889
00:30:27.634 --> 00:30:32.317 Was in the normal range of B12 in the upper
NOTE Confidence: 0.89384889
00:30:32.317 --> 00:30:36.146 normal range and his platelets were normal,
NOTE Confidence: 0.89384889
00:30:36.150 --> 00:30:37.938 his MCV normal.
NOTE Confidence: 0.840800659230769
00:30:40.380 --> 00:30:43.719 We’ll go and through the next slide
for a little bit more history.

We did a fit card that was negative because of his comorbidities.

Um, he was probably just about due for a colonoscopy now and the decision really wasn’t to do unless we had to. But his colonoscopy exactly 10 years ago was essentially normal as well, diverticulosis and internal hemorrhoids.

So I’m going to pass it on to Bob Bona and the questions first.

Would be what other testing would you recommend in this case? Thank you. Thanks, Frank.

And just to echo Kelsey,
I appreciate the opportunity to be here this evening to speaking with all of you, it’s a real pleasure. And so just to recap, this is a man in his 70s who has multiple medical issues who now has some symptoms of dyspnea and has what I would characterize in many of us would characterize as a moderate anemia. And I think what other tests would you recommend? I think it’s always helpful to know what the previous CBC values are certainly is this anemia developed rather quickly, has it been present for many years or many months,
00:31:59.630 --> 00:32:01.274 in which case the the dyspnea

00:32:01.274 --> 00:32:03.228 may not be related to the anemia.

00:32:03.230 --> 00:32:05.882 So having those values is really

00:32:05.882 --> 00:32:08.767 very helpful and also keeping in

00:32:08.767 --> 00:32:11.347 mind that individuals who develop

00:32:11.347 --> 00:32:14.369 anemia slowly have a great capacity.

00:32:14.370 --> 00:32:17.210 To to to compensate for that and may

00:32:17.210 --> 00:32:20.147 and may or may not have symptoms

00:32:20.147 --> 00:32:22.287 until they get quite anemic.

00:32:22.290 --> 00:32:24.225 The Reticulocyte count is really

00:32:24.225 --> 00:32:26.160 a must in this situation,

00:32:26.160 --> 00:32:28.183 I think where we're looking at in

00:32:28.183 --> 00:32:30.419 anemia where it’s not so straightforward.

00:32:30.420 --> 00:32:32.716 And then a peripheral blood smear I

00:32:32.716 --> 00:32:35.000 think is always a very reasonable

NOTE Confidence: 0.85454854

53
thing to request from our pathology colleagues to get any clues about what this anemia could be due to. The maybe there I’m going to come to as we go through this case if I could. So if you could please just advance the slide. So I just want to spend a minute talking about reticulocytes if I can because I think there’s a lot of confusion about how these are reported and how these are interpreted. So most of us know that these have been reported as percents, reticular site percent and then where we’ve been taught to calculate
a reticular site production index

or a curriculum.

Corrected reticulocyte count.

And then look at that number and to determine

if the anemia is hypo proliferative.

That is from the point of

view of the blood smear,

bone marrow not producing blood

cells or hyperproliferative.

Again, if you’re standing out in the blood,

the bone marrow producing a lot of blood,

a lot of blood cells,

the bone marrow are producing

a lot of blood cells,

and I personally find that

55
many of us do that.

The absolute reticulocyte count is probably the best way to think about this.

And just a moment, just a word about that.

So if the normal red count is $5 \times 10^6$ per microliter.

And the red blood cell survival is 100 days or so.

So our reticulocyte count is $1\% \times 50,000$. And sometimes this is reported as 50,000.
Sometimes in the Yale lab it’s reported as a number of times 10 to the 6th. So it comes out to point.

And so if a person has an anemia and has a reticulocyte count of 50 or 60 or 70,000, they are under producing red blood cells and the bone and the bone marrow is not able to compensate for the anemia. And on the other hand, if the articular side can is 150,000 for instance, that suggests that the bone marrow is producing a lot of red blood cells despite the anemia.
And this is critically important because there are only a couple of things that give an anemia with an elevated reticulocyte count. And one of those is of course hemolysis. With an adequate bone marrow response, you can have homolysis and not have an elevated reticulocyte count. So if you have iron deficiency for instance. Plus hemolysis, the bone marrow can’t respond. The other thing that will give an increased reticulocyte count is that there’s some recovery from an anemic process. So someone’s had a bleed and you’re seeing them a week or two.
Later and they're recovering.

Or as in the previous case that Kelsey discussed you,
you're giving someone iron and their anemia is getting better.

And in those cases, again, you'd expect the reticulocyte count to be increased as the bone marrow is recovering.

And just as a quick reminder, those.

Particular sites are the bigger,
blood smear indicated by the arrow.

So for me, absolute reticulocyte count is a
very important number that I look at
to try to help decipher the anemia.
And then if, yeah, if we could move.
Thank you.
So the blood smear is also very
important and especially if there are
some characteristic abnormalities described.
So for instance, if there are teardrop
cells noted on the peripheral blood smear,
we’re often thinking of myelofibrosis
or myelopoiesis.
Myelopoiesis, of course,
is where there’s something invading
the bone marrow.
That could be cancer.
It could be infection like tuberculosis.
It could be granulomas with sarcoid for instance. So the presence of teardrops is helpful. Burr cells are often seen in uremia spur cells and liver disease target cells and liver disease, etcetera. So I won’t go through the list, but these things you know can really help us a lot and give us clues as to why the patient is developing anemia. And we would either look at the smear in clinic ourselves or ask our pathology colleagues to look at this and then give a formal report in the chart.
Thank you. And so back to this case, I think represents one of the harder cases of anemia for me as a practicing hematologist because you have a patient who has multiple medical problems who has a moderate anemia, one that we can’t just say is just a tiny bit off. You know, there’s something going on here with the hemoglobin of 9 grams. And and it’s normal chromic and presumably normochromic. And I’m going to assume here that the reticulocyte count is low in this case.
So these are hard, hard anemias to decipher because there are many things that can cause the anemia and there are likely multifactorial causes of the anemia. And at the end of the day when I see someone like this, the question that’s in my mind is do they need Bone marrow biopsy, Bone marrow aspiration biopsy, determine the cause of the anemia? And on the left there is just kind of a broad overview of the classifications.
for anemia, bone marrow failure,

bone marrow replacement,

nutritional or hormone deficiency,
but if someone had a hemoglobin of 14 yesterday and they're nine today, they are going to be symptomatic and will likely need some urgent intervention. And so the history is quite important here to help us understand that in terms of the development of this anemia. And then the other thing to think about is there some other process that we need to deal with right away? Is this TTP, for instance, or are there just sites on the blood smear? Is there thrombocytopenia as well? Are there myeloblasts on the blood smear?
So this may be an acute leukemia.

So those are kind of things that we often need to think about right away.

Because those patients really need to be seen right away and triaged differently.

If those things are not present, so I'm thinking about it, could this be bone marrow invasion?

If there been weight loss, other sweats, fevers, is there a mass, is there a history of cancer?

Is there frequent urination with with
prostate enlargement and a possibility of prostate cancer for instance, because prostate cancer and bone marrow. Invasion is not uncommon. I always will think about multiple myeloma in this setting. So a normochromic anemia in an older individual I think who also has some chronic kidney disease. We need to make sure we’re not missing multiple myeloma and it often I will get protein studies in these individuals and those will include a serum protein electrophoresis and immunofixation electrophoresis and serum.
free light chains because about 20% of individuals with multiple myeloma. Will not have an M spike on their serum protein electrophoresis and the serum free light chains will be abnormal. I’m often thinking about in chronic inflammation here. There are a number of disorders this patient has that cause chronic inflammation. So I might be thinking about a SED rate or CRP, or I might think that’s superfluous at this point, that the patient does have chronic inflammation and I don’t really need to get a SED rate.
But one of the things that I'm also thinking about is temporal arteritis. And in my history I'm asking about headaches, weakness in the shoulders, and I'm pressing on the temporal arteries when I examine a patient like this cause another diagnosis that you certainly don't want to miss and is a common diagnosis. And even though this anemia is not microcytic or macrocytic with the way we usually think about nutritional deficiencies, I am going also going to think about a nutritional deficiency here as combined
with anemia of chronic inflammation or as a possible multifactorial process.

So even though this is not normal, not microcytic or macrocytic.

Anemia of chronic inflammation is also something we would think about and if you could go to the next slide please.

This person does have stage 3 chronic kidney disease and about 17% of patients with chronic kidney disease stage three will have anemia.

And the next slide please.

a very important slide here because I think this slide demonstrates to us that if you have a ferritin that is.
00:42:20.660 --> 00:42:23.481 200 or less with an iron saturation

NOTE Confidence: 0.818529248823529

00:42:23.481 --> 00:42:24.934 of 20% or less,

NOTE Confidence: 0.818529248823529

00:42:24.934 --> 00:42:27.188 you can still have iron deficiency if

NOTE Confidence: 0.818529248823529

00:42:27.188 --> 00:42:29.451 you have chronic kidney disease and

NOTE Confidence: 0.818529248823529

00:42:29.451 --> 00:42:32.296 the ferritin might even be as high as

NOTE Confidence: 0.818529248823529

00:42:32.296 --> 00:42:35.020 500 if you have more advanced kidney disease.

NOTE Confidence: 0.818529248823529

00:42:35.020 --> 00:42:38.620 And then so the final slide.

NOTE Confidence: 0.818529248823529

00:42:38.620 --> 00:42:40.130 Is that what I would do?

NOTE Confidence: 0.818529248823529

00:42:40.130 --> 00:42:42.790 I would certainly do the things we

NOTE Confidence: 0.818529248823529

00:42:42.790 --> 00:42:45.821 talked about the previous red cell CBC

NOTE Confidence: 0.818529248823529

00:42:45.821 --> 00:42:48.545 values or ticad peripheral blood count.

NOTE Confidence: 0.818529248823529

00:42:48.550 --> 00:42:51.196 I would probably give this person oral

NOTE Confidence: 0.818529248823529

00:42:51.196 --> 00:42:53.925 iron and see what happens with their

NOTE Confidence: 0.818529248823529

00:42:53.925 --> 00:42:57.552 anemia before I went off on a on a a

NOTE Confidence: 0.818529248823529

00:42:57.552 --> 00:42:59.763 workup that included a bone marrow biopsy.

NOTE Confidence: 0.818529248823529
I think if this person didn’t get better with oral iron or had monoclonal proteins in their blood or there was some other reason to suspect cancer, I would refer this patient. To hematology. So I would hope that this patient gets better with iron, but otherwise I think I would refer this patient for an evaluation by a hematologist.

Great, thank you very, very much. I had one questions on the retic count, I would do more and then we’ll move to the next case just so we can stay on time. You know one of those hallmarks of teaching that I still remember is.
Uh if you have someone with who might have iron deficiency anemia and you give them iron and the, you know the first thing that might improve before their hemoglobin is the retic count to know that if they’re responding and just would just sort of ask if that’s still common teaching and something that we can follow because we’ll see someone in two weeks. Let’s say we put them on iron and if we hadn’t had the retic before but check it now it, would it still be helpful to know that maybe we’re on the right track?
Yeah, absolutely, frank.
The reticulocyte count should be the first thing to respond.
And now we get some additional fancier tests that you may see sometimes there,
articulus reticulocyte, hemoglobin content.
So that’s just what it is, the amount of hemoglobin in particular sites and that often will respond even before the reticular site count does.
OK. All right. Thank you. Ohh.
And and we do have one, it totally falls into this question here.
How quickly do we expect to see a rise in the hemoglobin with iron supplement?

I'll tell you what I remember is, if they're appropriately dosed, it's usually 1 gram and three to four weeks.

That's how I remember it. Frank, is about a gram of hemoglobin in the first month improvement. Yeah.

All right, great. Thank you. Uh case 3DS is a 55 year old female history of hypertension, ulcerative colitis, high blood pressure, high and pre diabetes who
00:45:19.955 --> 00:45:22.280 comes in for routine physical.
NOTE Confidence: 0.902869432
00:45:22.280 --> 00:45:24.644 Her CBC is pretty much identical
NOTE Confidence: 0.902869432
00:45:24.644 --> 00:45:27.410 to the the year prior and we’ll
NOTE Confidence: 0.902869432
00:45:27.410 --> 00:45:30.490 point out that she has a high high,
NOTE Confidence: 0.902869432
00:45:30.490 --> 00:45:34.480 high platelets and a high MCV.
NOTE Confidence: 0.902869432
00:45:34.480 --> 00:45:35.548 I always think of before I
NOTE Confidence: 0.902869432
00:45:35.548 --> 00:45:36.480 was a doctor I was,
NOTE Confidence: 0.902869432
00:45:36.480 --> 00:45:39.603 I was actually a social worker in an HIV.
NOTE Confidence: 0.902869432
00:45:39.610 --> 00:45:41.845 Clinic and everyone had a
NOTE Confidence: 0.902869432
00:45:41.845 --> 00:45:45.640 high MCV back then, but.
NOTE Confidence: 0.902869432
00:45:45.640 --> 00:45:47.348 Otherwise, we don’t see it as often,
NOTE Confidence: 0.902869432
00:45:47.350 --> 00:45:50.556 but we thought that discussing a case
NOTE Confidence: 0.902869432
00:45:50.556 --> 00:45:53.750 of macrocytosis might be helpful to the
NOTE Confidence: 0.902869432
00:45:53.750 --> 00:45:56.360 to the participants and the attendees.
NOTE Confidence: 0.902869432
00:45:56.360 --> 00:45:59.030 So here’s the what we have,
NOTE Confidence: 0.902869432
00:45:59.030 --> 00:46:01.508 we’ll go to the next slide please.
Before we turn it over to Anna, here’s a list of her medications. There is an AC is not AZT or Combivir, but you can see she is on some medications for her colitis and a similar question. To the other two cases, what other testing or treatment would you recommend? And once again, one is a good time that we should be sending a referral to hematology. Alright, Anna, thank you. Thanks, Frank. Umm, just to touch on sort of
00:46:35.976 --> 00:46:38.720 macrocytosis and macrocytic anemia briefly.
NOTE Confidence: 0.628829122
00:46:38.720 --> 00:46:40.848 I wanted to start off by saying that,
NOTE Confidence: 0.628829122
00:46:40.850 --> 00:46:43.649 you know, I think you know as Bob
NOTE Confidence: 0.628829122
00:46:43.649 --> 00:46:46.477 Donna mentioned also that the lines are
NOTE Confidence: 0.628829122
00:46:46.480 --> 00:46:48.840 not so clearly delineated sometimes.
NOTE Confidence: 0.628829122
00:46:48.840 --> 00:46:50.478 So even though we like to think of anemia
NOTE Confidence: 0.628829122
00:46:50.478 --> 00:46:54.908 and the three buckets of microcytic,
NOTE Confidence: 0.628829122
00:46:52.010 --> 00:46:54.908 normocytic and macrocytic.
NOTE Confidence: 0.628829122
00:46:54.910 --> 00:46:56.527 You know, using just the cut offs,
NOTE Confidence: 0.628829122
00:46:56.530 --> 00:46:58.612 you know for example an epic
NOTE Confidence: 0.628829122
00:46:58.612 --> 00:47:00.000 is not always,
NOTE Confidence: 0.628829122
00:47:00.000 --> 00:47:01.757 is not always the way to go.
NOTE Confidence: 0.628829122
00:47:01.760 --> 00:47:03.800 Someone might be slightly macrocytic.
NOTE Confidence: 0.628829122
00:47:03.800 --> 00:47:05.676 I would still include you know all
NOTE Confidence: 0.628829122
00:47:05.676 --> 00:47:07.399 the workup that Doctor Bona just
NOTE Confidence: 0.628829122
00:47:07.399 --> 00:47:09.115 went through for the most part.
Similarly patients who are enormous headache, I might include workup that I’m about to go through now. I think where that doesn’t hold true is that the extremes. So somebody who’s extremely microcytic or extremely macrocytic, you know those differentials are are very different but I think there’s a big Gray zone in the middle. Umm, in terms of macrocytic anemia, I think you know two of the the big buckets that that falls into our, whether it’s megaloblastic or non megaloblastic,
which really has to do with whether DNA synthesis is actually being impaired, megaloblastic anemia. What we mean when we say that is we see some characteristic findings both in the bone marrow and on the peripheral blood, but just to speak about the peripheral blood for our purposes, things like hypersegmented neutrophils and also macrocytic. Um, red blood cells. These are can be indications that there is a megaloblastic process going on or impaired DNA synthesis leading to ineffective erythropoiesis.
the major causes of megaloblastic anemia are B12 and folate deficiency, which could really be a whole talk on its own.

But you know briefly how we work this up in the clinic, the gotos are just serum B12 and folate levels. I will say that you know, again just relying on the normal range and. especially in the case of B12 level is can sometimes be a pitfall because for a couple reasons.
I sort of consider things in the less than 400 range to be very borderline. And though that’s an area where I would always send an MMA to confirm, I put over here on the right an image to remind us, you know why we check homocysteine and MMA in B12 and folate deficiency and why we would see. Elevated you know MO, sorry, my life just went off. MMA and homocysteine and beach called deficiency and only homocysteine in folate deficiency. But so borderline B12 levels are a case where I would always send it.
also very strong clinical suspicion.

So even with a normal B12 level, if the story if everything else you know is really suspicious for B12 deficiency, I will send it.

It’s also worth being aware that patients with pernicious anemia, due to auto antibodies to intrinsic factor or to parietal cells due to actually a lab interference due to issues with the assay with the presence of these antibodies can have a normal serum B12 on lab testing when they’re actually B12 deficient. So again, if you’re suspecting this,
you’d want to check an MA as well, Umm.

And then a reminder that B12, severe B12 deficiency, we can see neurologic deficits.

And that’s why, you know, there’s the classic teaching that you want to be cautious not to treat folate deficiency without making sure that the patient does not have concurrent B12 deficiency, because you could have progression of neurologic symptoms in that setting because you’re not correcting the B12 deficiency.

So B12 and folate deficiency can happen for a variety of reasons,
and I’ll go through some of the common ones between the two of them in a second, but particular to B12 is pernicious anemia. She just spoke about PPI, which can inhibit absorption of B12. Strictly vegan diet, as B12 is often found in animal products. Less commonly seen from a dietary perspective because at least in the US, flowers routinely supplemented with folic acid to prevent neural tube defects. So it’s less common to see this, but we do see Alcoholics also in patients who have high cell turnover.
For a variety of reasons. So any patient with a chronic hemolytic anemia, including sickle cell anemia or psoriasis, these would be clinical scenarios in which you’d be more suspicious of folate deficiency. And in cases of macrocytic anemia will pretty much always at minimum, you know send these two tests. So just very quickly in terms of causes, etiologies of both B12 and folic deficiency with which have to do with how these micronutrients are absorbed. So B12 when it’s consumed in the upper GI tract, binds to transcobalamin,
00:51:36.715 --> 00:51:38.290 one, goes to the stomach,
00:51:38.290 --> 00:51:40.660 intrinsic factor is produced by the parietal cells of the stomach, binds to B12,
00:51:40.660 --> 00:51:43.965 goes into the small intestine where it's absorbed in the terminal ileum
00:51:43.965 --> 00:51:46.155 and then binds to transcobalamin 2.
00:51:46.155 --> 00:51:48.723 Absorbed into the bloodstream and taken up into the tissues,
00:51:48.723 --> 00:51:51.060 whereas folate is sort of a more passive absorption process but also absorbed in the small intestine.
00:51:51.060 --> 00:51:52.124 So for this reason anyone who’s had some kind of small bowel pathology including resection,
00:51:52.124 --> 00:51:53.720 whether that be small bowel resection,
bacterial overgrowth, inflammatory bowel disease, celiac disease, these patients are all at risk for deficiencies of both of these micronutrients. And then in particular, you do have gastrectomy as a potential cause of loss of parietal cells and therefore intrinsic factor, which could also lead to B12 deficiency. So this is just a very short list of medications that can cause macrocytosis. The ones I’ve included here and many of the medications that that do this in general actually do.
this via a megaloblastic process.

So they actually do interfere with DNA synthesis, which is why we see this macrocytosis.

There are others that can cause macrocytosis for other reasons, for example.

If somebody has G6PD deficiency and develops hemolytic anemia from a medication and can have a reticulocytosis in that setting.

And as Doctor Bonner showed us particular sites are larger cells.

So a higher percentage of particular sites increases your average MCV.
But here included are just medications that through megaloblastic process can cause an elevated MCV. And as Frank pointed out, antiretrovirals for HIV are a common one, so definitely something to consider if you have a patient on HIV medication. But there’s a host of them here including allopurinol and mercaptopurine, which the patient in this question stem was on both, but also anti epileptics, bacetrum and some other commonly used medications.

And so in terms of non megaloblastic causes of macrocytic anemia,
I know we’re running short on time and there’s a lot to go through. But in general, so these are a means by which causes of macrocytosis that don’t have to do with interference with DNA synthesis. So you wouldn’t see those classic megaloblastic changes like hypersegmented neutrophils etcetera. But some of these include liver disease, liver disease can cause anemia for a variety of reasons, some of which would not be macrocytic. For example, blood loss or anemia of chronic disease,
but other means which can lead to macrocytosis, such as alterations in the cholesterol content of red blood cells. Also hemolysis, which could be either from hypersplenism, portal hypertension or as Doctor Bona also mentioned on this the review of different smear findings spur cell anemia, which in liver disease in particular is a poor prognostic sign. You know this site. We'll consider as guided by history. So if someone has a history of liver disease, there's concern by imaging abnormal LFT's, maybe a low albumin,
NOTE Confidence: 0.868297492727273
00:54:58.990 --> 00:55:00.370 a slightly abnormal INR,
NOTE Confidence: 0.868297492727273
00:55:00.370 --> 00:55:03.170 any smear findings that could be consistent?
NOTE Confidence: 0.868297492727273
00:55:03.170 --> 00:55:03.822 You know,
NOTE Confidence: 0.868297492727273
00:55:03.822 --> 00:55:06.104 those are the situations where I would
NOTE Confidence: 0.868297492727273
00:55:06.104 --> 00:55:08.385 consider that liver disease could be the
NOTE Confidence: 0.868297492727273
00:55:08.385 --> 00:55:10.450 cause of the underlying macrocytosis.
NOTE Confidence: 0.868297492727273
00:55:10.450 --> 00:55:13.312 Alcohol use certainly can lead to
NOTE Confidence: 0.868297492727273
00:55:13.312 --> 00:55:15.800 macrocytosis and this can actually
NOTE Confidence: 0.868297492727273
00:55:15.800 --> 00:55:18.770 take months to resolve after the
NOTE Confidence: 0.868297492727273
NOTE Confidence: 0.868297492727273
00:55:20.790 --> 00:55:23.584 It's always important to take an alcohol
NOTE Confidence: 0.868297492727273
00:55:23.584 --> 00:55:26.236 history when working out these patients.
NOTE Confidence: 0.868297492727273
00:55:26.240 --> 00:55:29.282 As I mentioned increased reticulocytes which
NOTE Confidence: 0.868297492727273
00:55:29.282 --> 00:55:32.910 are larger cells and mature red blood cells,
NOTE Confidence: 0.868297492727273
00:55:32.910 --> 00:55:35.612 a higher percentage of reticular sites in
NOTE Confidence: 0.868297492727273
the peripheral blood increases the MCV.

So this is always something to consider like any anemia should be.

You know, one of your go to 1st test is a reticulocyte count and if elevated you have to consider whether there could be an active, you know, a bleed, but more likely.

If this patient is really macrocytic, some kind of hemolysis and you’d want to send sort of a hemolytic evaluation.

So LDH, haptoglobin, direct bilirubin, total bilirubin and a peripheral smear
hypothyroidism can also lead to macrocytosis.
You know, I, I do send this very often in these workups, but I think this also should be guided by history. I think it would be unusual to see somebody with a macrocytic anemia from hypothyroidism without otherwise having any other signs and symptoms of that. Um copper deficiency can cause anemia of pretty much, you know, any size red blood cell. But again, as guided by history, if someone has some kind of absorptive issue, dietary deficiencies for other reasons.
or zinc toxicity and you know, one of the sort of curls is somebody who’s using a denture glue that contains zinc, you know, which can paradoxically cause copper deficiency. Again, I don’t routinely send this just if it’s a high clinical suspicion or an otherwise totally negative. Uh, work up monoclonal gammopathy. So as Doctor Bona talked about two. So my threshold to send this for macrocytic anemia is very low. I’ll send it on pretty much anyone unless there’s a very clear clear cut reason.
You know why they have a macrocytic anemia. So that includes not just the spec but as Doctor Bona said the Immunofixation and the free light chains. And this can be even in the absence of other crab criteria. So even if you know the renal function is normal, they have no Bony pain calcium. Normally I would still send it. And then macrocytic anemia, the last thing I'll say I think is that you know even more so than the other, you know Norma acidic or or microcytic anemias.
The clinical suspicion for an underlying bone marrow process or malignancy has to be quite high and the threshold to refer to hematology very low because we wouldn’t want to miss something like an MDS or another malignancy, especially if this preliminary workup which is all pretty easy to obtain is negative or especially in the case where there are concurrent symptoms which might be concerning, but you know, the bottom line being that if there’s...
no clear reason for macrocytosis, whether it be medication, A B12, folate deficiency or any of these other things that you know, the threshold should be very, very low to refer to hematology for further workout.

Good. So I’ll take the liberty of just asking the two final questions and then we’ll wrap up.

So I’m doctor Zarkov power ask again about frequency of B12 level whether it should be continued
to be checked in patients on a bike rides and at what interval? Oh yeah. So good question. So I’m like on metformin. So that’s a good question. I don’t know that I really know the answer to that. My suspicion would be you know, as long as the patient is continuing on metformin, if they develop B12 deficiency on metformin, I would probably just keep them on B12, you know, now and then you know you could check a serum level and see if it’s responding every, you know, six months.
So obviously most patients are on metformin for years and years. I don’t know that there’s a clear cut guideline for how often. Repeat that, but I would probably just leave the patient on it.

And then Doctor Reeve asks patients, especially seeing naturopaths bring in reports of their methylenetetrahydrofolate reductase testing. And the question is how? How much do they need this very special form of folate that’s often prescribed for them if
they’ve been asymptomatic?

Yeah, no, I’m not aware of there being any data, you know,

You know, somebody has fully 50.

Folic acid usually use in one to two milligrams per day orally as well.

It’s very orally bioavailable,

you know, people will respond to that.

So no, I’m not aware of there being any other formulations

would be necessary in the setting of fully deficiency and especially not,

you know, if there’s no fully

deficiency. OK.

And now one final question.
Like iron, I understand that the B12 orally is actually more effective than we've given it credit for. We have a lot of people who are on injections. What is your threshold to cross over from oral to injection? So, you know, I think it depends on the severity of the deficiency and also the D so for example, not that any of us really see this anymore or or often, but if somebody were to present to you with neurologic symptoms for example, that's somebody you'd want to
01:00:55.035 --> 01:00:56.520 I am injections right away.
NOTE Confidence: 0.852815083888889
01:00:56.520 --> 01:00:58.186 You wouldn’t want to wait you know
NOTE Confidence: 0.852815083888889
01:00:58.186 --> 01:01:00.601 for an oral supplement also if it’s
NOTE Confidence: 0.852815083888889
01:01:00.601 --> 01:01:02.486 somebody who has B12 deficiency
NOTE Confidence: 0.852815083888889
01:01:02.486 --> 01:01:05.040 for a malabsorptive reason either
NOTE Confidence: 0.852815083888889
01:01:05.040 --> 01:01:09.094 because of a gastric bypass surgery.
NOTE Confidence: 0.852815083888889
01:01:09.094 --> 01:01:10.211 Permission, yeah,
NOTE Confidence: 0.852815083888889
01:01:10.211 --> 01:01:12.166 they’re not going to respond
NOTE Confidence: 0.852815083888889
01:01:12.166 --> 01:01:15.419 So those patients need to be on,
NOTE Confidence: 0.852815083888889
01:01:15.420 --> 01:01:17.004 I am probably lifelong,
NOTE Confidence: 0.852815083888889
01:01:17.004 --> 01:01:19.380 but otherwise in somebody who has
NOTE Confidence: 0.852815083888889
01:01:19.456 --> 01:01:21.664 bowed pathology who has no reason
NOTE Confidence: 0.852815083888889
01:01:21.664 --> 01:01:23.910 to not be absorbing it orally.
NOTE Confidence: 0.8145971
01:01:25.990 --> 01:01:28.130 PO B12 is very effective, you know,
NOTE Confidence: 0.8145971
01:01:28.130 --> 01:01:32.130 usually 1000 micrograms daily. Good.
Well, I the pace kind of picked up at the end and I apologize for my time management that didn’t have us a little more evenly spaced, but tremendous gratitude to all of our panelists. This was really terrific information. Like Frank, I was part of the preparation and still learned. So there were a lot of both, you know, very practical tips here the upcoming speakers are demonstrated, you know on the slide. Here we do not have a talk in January. It’s just a little early in the
month after the holidays to do that.

So please join us and if you don’t mind, please stay on.

There will be a very quick survey at the end in order to.

Just make sure that we get your feedback to help us in the future so Anne Chang couldn’t be here.

But on behalf of Anne and myself, we thank you so much for your attendance and again, thank you to our panelists.

Goodnight. Thank you. Goodnight.