Clinician-Ordered Peripheral Smear Review by a Pathologist Has Low Clinical Utility—A Reference Laboratory Perspective

Article:
Sanjai Nagendra, Jamie Mongillo, Krystin Dodge, Pratistha Ranjitkar, Betty Burns, Lavonda Allen.
Clinician-Ordered Peripheral Smear Review by a Pathologist Has Low Clinical Utility—A Reference Laboratory Perspective.
J Appl Lab Med 2025; 10(2): 352–8. https://doi.org/10.1093/jalm/jfae101

Guest: Dr. Sanjai Nagendra is a senior hematopathologist and CLIA Medical Director of Labcorp's Center for Esoteric Testing, Atlantic Division Regional Laboratory.

Randye Kaye: Hello and welcome to this edition of *JALM* Talk from *The Journal of Applied Laboratory Medicine*, a publication of the Association for Diagnostics & Laboratory Medicine. I am your host, Randye Kaye.

In many healthcare institutions and reference laboratories, clinicians are able to order a peripheral smear that is reviewed directly by a pathologist. This test may be requested for a variety of indications such as clinical suspicion of hematologic disease or to monitor hematologic disease. While this practice has existed for decades, more recent advances in the automation of hematology analyzers have allowed for the detection of many clinically significant findings that previously required manual review. Therefore, some experts have questioned the continued value of the clinician-ordered peripheral smear review by a pathologist, as it is considered labor intensive and of limited clinical value.

The March 2025 issue of *JALM* features a study that analyzed 200 consecutive clinician-ordered peripheral smear reviews by a pathologist, along with their corresponding completed blood count results within a reference laboratory. The authors assessed whether a laboratory-derived smear review process based on CBC results was sufficient to detect significant hematologic abnormalities.

Today, we're joined by the article's corresponding author, Dr. Sanjai Nagendra. Dr. Nagendra is the senior hematopathologist and CLIA Medical Director of LabCorp Center for Esoteric Testing, Atlantic Division Regional Laboratory. Dr. Nagendra has extensive laboratory management and leadership experience in the hospital setting, having served as Medical Director and Chair of the Department of Pathology in large academic centers in the Midwest and Northeast. He has a special interest in laboratory stewardship and is one of the founders of LabCorp's laboratory stewardship program. Welcome, Dr. Nagendra.

First, what is a clinician-ordered peripheral smear review by pathologist? We can use the acronym you used in the paper, CPSR. And why do clinicians order it?

Sanjai Nagendra: So, historically, clinicians have ordered peripheral smears when there are signs and symptoms of hematologic disease. For example, the patient might have anemia or they look anemic, or they look like they have fatigue, and then they order it. Or, the other reason they may order it is when a patient has a CBC and they see some sort of abnormality that they can't explain and they're concerned about hematologic disorders. So, those are the reasons they order it.

In these kind of tests, a pathologist reviews, they review all the cytes. They review the erythrocytes, the leukocytes, and the platelets, and they render an interpretation of the findings. This practice really started decades ago when hematology analyzers were not as sophisticated in detecting abnormalities, and for that reason, clinician have been ordering it for decades, because they're used to that, and many of the books and reference materials have said that. That's how kind of they're trained and that's how it's been perpetuated over many years.

Randye Kaye: Okay. Thank you. Now, the more routine option to investigate hematologic abnormalities is the CBC, the complete blood count. In the current era of modern automated hematology analyzers, what's the typical process or workflow that clinical labs use to assess CBCs and work up abnormalities found on the CBC?

Sanjai Nagendra: Well, CBCs are analyzed by a sophisticated process. First, they go through a hematology analyzer and a lot of these analyzers nowadays are using flow cytometry, another advanced technique, and they're flagged. There are flags built into the system that flag for abnormalities. In addition, middleware rules are also set up in most laboratories with a complex set of rules based upon these middleware rules, and that allows certain types of abnormalities to be flagged or peripheral smear review. Based upon if there are abnormalities, a smear is performed, and is known as a laboratory-derived smear review.

Then the slide routinely is looked at by a medical laboratory scientist and they will look if they saw any type of abnormality on the instrument or on the middleware and they will try to reconcile that. But if there's a concern for a possible hematologic disorder, for example, if there are possible blast, if there are lymphoma cells, schistocytes, any type of abnormality, then the pathologist is given the smear to look at.

The pathologist then looks at the smear and then renders a diagnosis, and if it's an immediate concern to the patient, for example if they have acute leukemia or anything, then a clinician is called and they're alerted to the fact. So, this goes into effect without the clinician doing anything. The clinician doesn't need to order anything. If there are abnormalities, we detect them and we call them.

Randye Kaye: Okay. Thanks. Well, now, let's focus a bit on the study described in your article. Can you summarize for us what your laboratory did to assess the utility of CPSR? And what were your major findings?

Sanjai Nagendra: What we did—we did a retrospective study, and we have 200 consecutive clinical samples of CPSRs, and the scope of the study was over the Atlantic seaboard. LabCorp covers a large area and our regional laboratory here covered the Carolinas, Virginia, District of Columbia, and Maryland, and we used those smears and we looked at them first to see what the CPSR was showing and interpreting, and then we also then retrospectively looked at their CBCs. We looked at the peripheral smears and see what of these were looked at already by a technologist and what of these were not looked by a pathologist or a clinical laboratory scientist because they were non-specific.

Then what we found is that one-third of the CPSRs were normal. So, clinicians were ordering it but there was no abnormality, and most of the remaining CBCs and CPSRs had non-specific abnormalities, for example, they'd have a mild neutrophilia or an anemia or thrombocytopenia that cannot be characterized specifically as anything. Back to our laboratory-derived smear review, or LDSR, that identified 100% of hematologic abnormalities. Whatever hematologic abnormalities that the clinicians asked for, they were already identified by the laboratory-derived smear review, and we found no major discrepancies were noted in the CPSRs that did not meet the LDSR criteria. So, that's what we found. So, based upon this data, we recommended discontinuing the CPSR here at LabCorp.

Randye Kaye: Okay. Thank you. That are really interesting findings. So, now that you have proposed that CPSR be discontinued, can you talk about the advantages of the discontinuation for patients and for healthcare facilities, and are there any disadvantages?

Sanjai Nagendra: So, one of the biggest advantages is improved turn time for patient reports. So, clinicians used to wait two to four days sometimes to get clinical reports, but they don't need to do that, because if there are abnormalities, then we will contact them, and significant abnormalities, as we have always done are captured by the laboratory-derived smear review. There

is also the advantage of less clutter of patient record with clinically insignificant reports, because if something is not reported on, it's non-specific.

There is also a resource saving for pathologists, medical technologists, and medical assistants in the laboratory. We do know that pathologists are in short supply, medical laboratory scientists are also in short supply, and there are lots of activities that are clinically impactful, and we can shift some of this with the discontinuation to more clinical and pathologist activities and improve their turnaround time.

Randye Kaye: So, I am hearing a lot of advantages, which is fantastic. Are there any disadvantages?

Sanjai Nagendra: So, I think the biggest disadvantage for discontinuation is education, and trying to educate the masses, and a lot of clinicians have been doing this for decades. So, they're used to doing it, but because technology and everything has changed, the disadvantage is that we're trying to educate all the clinicians, and it takes a lot of time for changes. So, what we hope to do is to continue to get this to other societies and other best practice committees and other things to get this out into the clinical realm, even in training documents, so then clinicians will be educated. So, I say that everything is really an advantage, but in summary, the disadvantage is getting the masses to change their practices.

Randye Kaye: All right. Thank you. It sounds more of a challenge than a disadvantage. But thank you so much, very interesting findings, and thank you for joining us today.

Sanjai Nagendra: Thank you.

Randye Kaye: That was Dr. Sanjai Nagendra from LabCorp, describing the *JALM* article, Clinician-Ordered Peripheral Smear Review by a Pathologist Has Low Clinical Utility—A Reference Laboratory Perspective. Thanks for tuning in to this episode of *JALM* Talk. See you next time and don't forget to submit something for us to talk about.