Orders for manual differentials

Q We have an ER doctor who orders manual differentials in her initial order regardless of knowing either the automated results or even the CBC results. We are trying to compose a letter to her and other physicians regarding the accuracy of the automated differential and include any statistics that back up the validity of reporting automated differentials vs. manual differentials. We have a policy when we do a manual differential and statistics from the instrument manufacturer, but our pathologist wants more. Can you help us with information about a published article or a website?

A We know from numerous studies that an automated differential has distinct advantages over a manual differential. Manual differentials are hindered by intra- and inter-observer variation, uneven distribution of cells on the slide, statistical sampling errors due to a lower total number of cells counted, and the possibility of recording errors. In addition, a manual differential adds significantly to the turnaround time of the CBC results. Because automated differentials count many more cells (often 10,000 compared to 100 cells for a manual differential), and are independent of the manual problems that can lead to errors, they produce results that have been shown to be statistically more accurate than manual counts.

Of course, automated differentials cannot completely replace manual differentials; and there are certain situations (failure of the machine to provide a parameter, instrument flags, and other pre-determined laboratory factors) that still require a manual differential. The second important reason for doing manual review is to do a morphologic examination for blasts, immature monocytes, dysplasia, or other abnormal cells (lymphocytes, blasts, immature monocytes, dysplasia, or other abnormal cells). The goal, obviously, is to maximize efficiency and accuracy by doing manual differentials only in situations where it is helpful or necessary. Some statistics and graphs are available in a 2002 paper. This paper discusses the problems associated with a manual differential and the history of automated cell counters, and provides graphs and charts showing the primary advantages of automated counts.

Despite our efforts, however, there are always going to be clinicians who will order a manual differential up front with their initial CBC. In most cases, they do this merely out of habit, or because they falsely believe that the manual differential is superior to the automated type. Attempts to educate these clinicians, as you are trying to do, are invaluable, and will likely require repeated efforts. In addition to this, another useful strategy (and one we currently use) is to simply no longer allow a manual differential to be ordered up front. In our case, we have removed it from our requisition. The clinician can still request a manual differential by writing it in the “other test” location, or by calling the laboratory to request it. But in these situations, we will do a smear review rather than an actual manual differential. This involves scanning the slide and confirming that it looks consistent with the automated differential. If so, the automated differential is used, and a comment of “smear reviewed” is added. In this way, the clinician still has the possibility of notifying the laboratory that a manual differential may be needed for a particular patient but attempts to avoid its occurrence. The manual differential is, therefore, primarily reserved for those situations when the instrument flags or other laboratory policy deems it necessary.

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References

Staffing guidelines from workload

Q How does one calculate for justification of retention the number of laboratory personnel to the patient volume and tests performed?

A Unfortunately, there are not good guidelines for estimating the number of personnel needed for a lab based on workload or patient population. Although some organizations may have developed such guidelines based on their workload and complexity, there are no guidelines that are workable in labs with different mixes of tests and workloads.

There have been a number of attempts to develop staffing guidelines, but they have not been very useful.

There have been a number of attempts to develop staffing guidelines, but they have not been very useful. One such program was the CAP Workload Reporting System that attempted to assign weighted workload units based on minutes of technical time. After a number of years, however, this program was abandoned because of great inaccuracies. Information obtained with the CAP program was useful within individual sections of a specific lab, but it was inconsistent across different sections of the lab and between different labs.

The Workload Reporting System has been replaced by CAP’s Laboratory Management Index Program, or LMIP, which uses standardized billable test counts. A lab can compare its test numbers and paid-personnel hours with other labs of similar size in the same geographical area, thus assessing its effectiveness in the use of its staff. This system does not predict staffing requirements.

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Clinitest interpretation in pluses

What is your interpretation of the negative, trace, trace 1+, 2+, and so forth, are conventional lab terms and other reporting formats compared to the percentage format as listed on the Clinitest package insert? Could the experts help clarify for me?

The plus scale (negative, trace, 1+, and others) for reporting urine glucose is a semi-qualitative reporting scale that contains no units. To correlate this plus scale to the Clinitest method for detecting reducing substances in urine, one can use the glucose-reporting scale associated with urine dipsticks for comparison. The Clinitest method detects reducing substances in urine by their conversion of cupric sulfate to cuprous oxide. This produces a color change in the sample, which is read visually against a chart to obtain the concentration of reducing substances present. The reporting scale for the Clinitest 2-Drop Method gives values of negative, trace, ½%, 1%, 2%, 3%, and 5%. These percentage values are equivalent to g/dL units (i.e., ½% equals 0.5 g/dL or 500 mg/dL). The use of percentage values is typically no longer used for reporting of laboratory data and should be replaced with g/dL or mg/dL.

In looking for a comparison to the plus-reporting system, I was able to find a reference in the Clinitek 500 Operator’s Guide. The Clinitek is an automated urine-dipstick reader than is capable of reporting dipstick results in different formats. It gives the option of reporting results using the plus system. Using Bayer Multistix 10 SG reagent strips reported in conventional units, a comparison can be made as shown in the table below. This can then be applied to the Clinitest percentage format as shown.

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References

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