**WBCs Side Estimate Study Summary 2014**

12 CLSs performed WBC estimates on ten slides. The WBC counts ranged from 1.9 to 37.7 x103/cc. Per SOP 1117.t *WBC Estimate on Peripheral Blood:*

Evaluate a wedge smear for acceptable cell distribution, feathered edge and staining.

Count the number of both intact and disrupted WBCs in each of ten fields where the RBCs overlap slightly, under 50X oil immersion objective.

Multiply this number by 300 to get the estimated WBC count per L.

The WBC estimate should agree with the automated WBC count by 10%

The average WBC estimates performed by 12 CLSs within 10% of the LH780 WBC counts were 2 out of 10. Four out of 10 estimates agreed by 20%. Estimate ranges were anywhere from 10 to 50% of the LH780 WBC, with no pattern.

The first conclusion is that SOP 1117.t has been changed to *The WBC estimate should agree with the automated WBC count by 20%.(December, 2014)*

The second conclusion is more important. Extensive correlations have been performed here at UCDHS and historically by peers and research. The automated impendence WBC count is more accurate than a manual hemacytometer chamber count. Interference may occur with large and giant platelets, schistocytes, or platelet clumps. The important point is to trust the WBC count *within reason*.

But *within reason* is the difficult part. First correctly interpret the histogram. Second do not overcorrect for NRBC’s. The manual calculation should only be used when the WBC changes significantly, because the manual correction overcorrects the WBC count. Please refer to the *LH780 Uncorrected WBC’s and NRBC’s* handout.

Most important is to rely on the histogram review and the automated WBC count more than on the WBC estimate. It will be rare to report the manual correction. Please refer to the following examples:

**1.**



No clots in sample, no platelet clumps on slide. Slide estimate~7.5 NRBC=0

What is the reported WBC? This histogram shows cellular interference. Report LH780 corrected WBC=7.8

**2.**



No clots in sample, no platelet clumps on slide. Slide estimate~4.0 NRBC=582

What is the reported WBC? The histogram shows NRBCs with the count being cut off at the 35fl mark. Any NRBC’s smaller than 35fl are not counted. The manual correction (32.0/(100+582))100= 4.7. This is an overcorrection of the WBC count, because the small NRBCs were never included in the WBC count. Report the LH780 corrected WBC=5.6

**3.**



No clots in sample, no platelet clumps on slide. Slide estimate ~8.7 NRBC =88

What is the reported WBC? The histogram shows NRBCs with the count being cut off at the 35fl mark. Any NRBC’s smaller than 35fl are not counted. The manual NRBC correction (26.1/(100+88))100=13.9. This is an overcorrection of the WBC count, because the small NRBCs were never included in the WBC count. Report the LH780 corrected WBC=16.6

**4.**



No clots in sample, no platelet clumps on slide. Slide estimate~1.0. NRBCs=829.

What WBC is reported? The histogram clearly shows NRBC’s. The histogram shows NRBCs with the count being cut off at the 35fl mark. Any NRBC’s smaller than 35fl are not counted. The estimate is essentially the same as the LH780 WBC count. Report LH 780 corrected WBC=0.9.

**5.**

Original Run



The BC needs to be corrected due to the high WBC interference. Use the uncorrected WBC count to correct the RBC count.

RBC=2.86-0.1363=2.72

HGB= (2.72\*41.4)/10=11.3

HCT= (2.72\*120.7)/10=32.8

Pump & Dump



No clots in sample, no platelet clumps on slide. Slide estimate~48.0. NRBCs=329.

What WBC is reported? The histogram clearly shows NRBC’s. The histogram shows NRBCs with the count being cut off at the 35fl mark. Any NRBC’s smaller than 35fl are not counted. However; the slide WBC estimate of 48.0 is markedly different than the automated WBC of 109.9. This is a rare example of when a manual calculation is needed.

The manual corrected WBC 136.3/(100+329)= 31.8. In this case report the manual corrected WBC = 31.8