The CAP recommends reporting WBC classifications as absolute values.

Historically, we have reported only percentages of WBC’s with a reference range for the percentage, or relative concentration of the cell types. However, for clinical interpretation, these WBC proportions must be converted to absolute numbers by multiplying the percentage of a given WBC type (for example, neutrophils) by the overall WBC count. There is potential for error if this conversion is performed outside the laboratory by the clinical services. Generally, clinically relevant WBC elevations (“cytoses”) and declines (“cytopenias”) are defined by their absolute numbers, not by their relative proportions. Based on this, current recommendations, including those of the CAP Hematology and Clinical Microscopy Resource Committee and the Clinical and Laboratory Standards Institute, state that the absolute count is the preferred reporting method for the WBC differential.

As of October 21st 2013 we will no longer report the reference range for the percentages of the WBC differentials, and we will begin reporting a reference range for the absolute concentrations of WBC’s.

The following chart gives the normal ranges for absolute counts approved by Dr. Malcolm for each age group.

Note that these are reported in the same manner as the WBC, that is, in thousands per mm3.

Also note that if the differential is performed manually, or by cellavision, that the absolute values will calculate from the final differential percentages, and will not match the coulter printout.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Age Group** | **#Neut** | **#Lymph** | **#Mono** | **#Eos** | **#Baso** |  |
| 0 - 6 Days | 1.5 - 11.4 | 1.75 - 11.5 | 0.2 - 1.8 | 0 - 0.4 | 0 - 0.1 |  |
| 7 days - 2 Mo. | 1.0 - 9.5 | 2.0 - 16.5 | 0.2 - 2.2 | 0 - 0.4 | 0 - 0.1 |  |
| 2 Mo. - 2 Yrs | 1.0 - 8.5 | 3.0 - 13.5 | 0.3 - 2.7 | 0 - 0.4 | 0 - 0.1 |  |
| 2 - 6 Yrs | 1.5 - 8.0 | 1.5 - 9.5 | 0.3 - 1.2 | 0 - 0.4 | 0 - 0.1 |  |
| 6 - 12 Yrs | 1.5 - 8.0 | 1.5 - 7.0 | 0.3 - 0.9 | 0 - 0.4 | 0 - 0.1 |  |
| > 12 yrs | 1.8 - 7.7 | 1.0 - 4.8 | 0.4 - 1.3 | 0 - 0.4 | 0 - 0.1 |  |
|  |  |  |  |  |  |  |

The following information is from an article in CAP today about reporting in absolute values, and gives specific examples of clinical significance related to increased absolute concentrations ( cytosis ) and decreased absolute concentrations ( cytopenias ).

Absolute neutrophil count (ANC). The functional ANC includes the absolute number of segmented neutro­phils and bands. Neutrophilia (>6.8 × 109/L for adults in our laboratory) is associated with infections, a variety of inflammatory disorders, cytokine therapy, and some myeloid neoplasms. Neutropenia (<1.8 × 109/L for adults in our laboratory) can be seen with various medications, including chemotherapy, toxins, bone marrow replacement (for example, metastatic tumor, granulomas), myelodysplastic syndromes, autoimmune disorders, and congenital disorders. Generally, the degree of neutropenia defines the patient’s risk of infection.

For example, an ANC less than 0.5 × 109/L is associated with a significantly increased propensity for serious infection; a patient with this degree of neutropenia and a fever most often requires parenteral antibiotics. Patients with an ANC of 0.5–1.0 × 109/L have some propensity for infection but often can be managed as an outpatient.

Absolute lymphocyte count. Lymphocytosis (>3.4 × 109/L for adults in our laboratory) may be noted in a variety of disorders, including infections, in particular viral infections, autoimmune diseases, and lymphoproliferative disorders.

For example, a diagnosis of chronic lymphocytic leukemia requires a clonal lymphocytosis of =5.0 × 109/L for at least three months (in the absence of extramedullary disease).

Absolute monocyte count. Monocytosis (>0.8 × 109/L for adults in our laboratory) may be seen with chronic myelomonocytic leukemia (CMML), acute myeloid leukemias, chronic infections, autoimmune disorders, cytokine therapy, carcinoma, and as a response to neutropenia.

For example, one criterion necessary for a diagnosis of CMML is an absolute monocyte count of =1.0 × 109/L.

Absolute eosinophil count. Eosinophilia (>0.4 × 109/L for adults in our laboratory) can occur with allergic or atopic disease, infectious disorders (including parasites), medications, immunologic reactions, skin disorders, pulmonary syndromes, rheumatologic diseases, myeloproliferative neoplasms, and secondary to other malignancies.

For example, one criterion required for a diagnosis of chronic eosinophilic leukemia is an absolute eosinophil count =1.5 × 109/L.

Absolute basophil count. Basophilia (>0.1 × 109/L for adults in our laboratory) may be associated with myeloproliferative neoplasms, hypersensitivity reactions, hypothyroidism, iron deficiency, and renal disease.