# Reference Range

**Attachment C**

**Cerebrospinal Fluid Reference Range:**
The inability to collect cerebrospinal fluid specimens in the normal, non-diseased population limits the ability to determine reference ranges. Literature suggests the following normal reference ranges.

**RBC:**

| | |
|---|---|
| Newborn preterm | 0-1000/uL |
| Newborn term | 0-800/uL |
| Neonate | 0-50/uL |
| >3 Months | 0-5/uL |
| Adult | 0-5/uL |

**WBC:**

| | |
|---|---|
| 0-1 months | 0-27/uL |
| 2 months-16 years | 0-7/uL |
| Adults | 0-5/uL |

(Adopted from CLSI, H56-A, VOL.25, N0. 20 guidelines)

**Differentials:**

| Cells | Neonate | Adult |
|---|---|---|
| Neutrophils | 0-8% | 0-6% |
| Lymphocytes | 5-35% | 40-80% |
| Monocytes | 50-90% | 15-45% |

(Adopted from CAP, Color Atlas of Body Fluids 2006)

**Interpretations:**
Reportable body fluid results may exceed commonly accepted normal reference ranges for all body fluids, so results should always be interpreted in light of the total clinical presentation of the patient, including clinical history, data from additional tests, and other appropriate information.

# BAL Reference Ranges

**Attachment C**

**Bronchoalveolar Lavage:**
BAL is defined a bronchoscopic procedure retrieve cells and soluble substance from the lining fluid of distal airways and alveolar units, containing immunologic components of lung's epithelial surface. The procedure thus provides a sample that represents a correlate to an endobronchial or transbronchial biopsy tissue specimen and cellular immunologic components in vascular circulation. It provides a specimen that is involved with a disease process or in close approximation with it.

| | |
|---|---|
| **BAL Nucleated Count** | No established range |
| **BAL RBC** | No established range |
| **BAL Macrophanges** | 80-100% |
| **BAL Lymphocytes** | 0-15% |
| **BAL Neutrophils** | 0-3% |
| **BAL Eosinophils** | 0-1% |
| **BAL Basophils** | 0% |
| Adopted from: University of Washington Medical Center | |

**Reference Ranges for Other Fluid Types:** *Refer to HEM 123-13-00 XE-5000 Body Fluid Operation Attachment C: Body Fluid/CSF Reference Ranges.*

**Interpretations:**
Reportable body fluid results may exceed commonly accepted normal reference ranges for all body fluids, so results should always be interpreted in light of the total clinical presentation of the patient, including clinical history, data from additional tests, and other appropriate information.

# Reference Range

**Attachment C**

**Serous Fluids Reference Ranges:**
The accumulation of fluid in a serous cavity is an indication of a disease state. The normal, on-diseased population has no fluid accumulation. Therefore, there are no normal reference ranges for serous fluids. However, the number of cells present in a serous fluid is used to aid in the classification, diagnosis and treatment of disease.

**Synovial Fluid Reference Ranges:**
The inability to collect synovial fluid specimens in the normal, non-diseased population limits the ability to determine reference ranges. Literature suggests the following normal reference ranges.

**Other Body Fluid Values:**

| | Pleural | Peritoneal | Synovial |
|---|---|---|---|
| **Color** | | | Colorless/pale or yellow |
| **Clarity** | | | Transparent |
| **Viscosity** | | | Very high |
| **Nucleated Count** | 1395-3734/uL | 0-84/uL | 13-180/uL |
| **RBC** | | 0-72/uL | 0-2000/uL |
| **Neutrophils** | 0-1% | 2-34% | 0-25% |
| **Lymphocytes** | 18-36% | 0-50% | 0-78% |
| **Macrophange** | 64-80% | 9-61% | 0-71% |
| **Eos** | | 0-14% | |
| **Baso** | | 1-5% | |
| **Mesothelial** | 0-2% | | |
| **Synoviocytes** | | | 0-12% |
| **Histocytes** | | | 0-26% |
| **Volume** | 4.1-12.7 mL | | |
| (Adopted from CLSI, H56-A, VOL.25, N0. 20 guidelines) | | | |

**Interpretations:**
Reportable body fluid results may exceed commonly accepted normal reference ranges for all body fluids, so results should always be interpreted in light of the total clinical presentation of the patient, including clinical history, data from additional tests, and other appropriate information.