Health problem addressed

Used to count blood cells. An abnormal red cell count may indicate polycythemia or anemia, which occurs because of blood loss, failure of the bone marrow to produce RBCs, vascular hemolysis, hypersplenism, or deficiencies of iron, vitamin B12, or folic acid. Abnormal white cell counts may indicate allergies, bacterial or viral infections, inflammatory disorders, tumors, tissue destruction, toxic metabolic states, leukemia, myeloproliferative syndromes, parasitic infections, or typhoid fever.

Product description

Handheld device or benchtop device, sometimes placed on a cart, with a display (usually LCD), a keypad to enter information, and a slot to insert a test strip or sample tube. Some models may have alarms, memory functions, touchpens, USB ports to transfer data to a computer, and/or a small storage compartment for reagents.

Principles of operation

Red blood cell, white blood cell, and platelet counts are obtained using the volumetric impedance technique, which creates pulses which are amplified; the magnitude of the pulse is directly proportional to the volume of the cell. Another method is the light-scatter technique, which counts and sizes cells by detecting the amount of light scattered by a stream of hydrodynamically focused cells. Within minutes of placing the sample into the analyzer, the sample’s cells have been quantified, and results are analyzed and displayed.

Operating steps

Whole blood samples are placed in tubes, on reaction cuvettes, or on test strips, and loaded into the analyzer. The operator may select the tests being performed on the sample using a keypad or connected computer.

Reported problems

Operators should be aware of the risk of exposure to potentially infectious bloodborne pathogens during testing procedures and should use universal precautions, including wearing gloves, face shields or masks, and gowns.