Glucose Analyzer

**Health problem addressed**
Used to test for and manage diabetes by measuring blood glucose levels; also used to test for transient high or low glucose levels (e.g., during surgery); they are also used in sports medicine.

**Product description**
Handheld device with a display (usually LCD), a keypad to enter information, and a slot to insert a test strip containing a drop of blood which is tested for glucose. Some models may have alarms, memory functions, touchpens, USB ports or wireless features to transfer data to a computer, and/or a small storage compartment for test strips.

**Principles of operation**
In optical BGMs, the blood sample is exposed to a membrane covering the reagent pad, which is coated with an enzyme (glucose oxidase, glucose dehydrogenase). The reaction causes a color change; the intensity of this change is directly proportional to the amount of glucose in the blood sample. Light from an LED strikes the pad surface and is reflected to a photodiode, which measures the light’s intensity and converts it to electrical signals. Electrochemical BGMs use an electrode sensor to measure the current produced when the enzyme converts glucose to gluconic acid. The resulting current is directly proportional to the amount of glucose in the sample.

**Operating steps**
The test strip is inserted into the device either before or after the addition of blood to the pad; timing begins automatically when the monitor senses blood on the strip. Within seconds, a reading is taken and displayed.

**Reported problems**
Outdated or improperly stored test strips can produce inaccurate glucose readings. Healthcare personnel who use BGMs in multiple-patient facilities should be aware of the risk of exposure to potentially infectious bloodborne pathogens during testing and cleaning procedures. Cross-contamination can occur if appropriate infection control measures are not taken. Lancing devices can cause needlestick injuries.

**Use and maintenance**
User(s): Patient, clinician, nurse
Maintenance: Patient or clinician
Training: Training manual

**Environment of use**
Settings of use: Home, hospital, physician clinic
Requirements: NA (battery-operated handheld devices do not have special settings requirements)

**Product specifications**
Approx. dimensions (mm): 90 x 50 x 100
Approx. weight (kg): 0.65
Consumables: Test strips, batteries
Price range (USD): 15 - 1500
Typical product life time (years): 5-7
Shelf life (consumables): Test strips: 6 months

**Types and variations**
Specialized devices for neonate may be available; some devices not intended for use with neonates; some models allow alternate-site testing (fingertip, forearm, palm)