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Controlling Variables in Vacuum Assisted Deliveries: Assessment of an Electronic Vacuum Gauge

Objective: The accuracy of an electronic vacuum gauge connected to handheld vacuum pumps was measured as part of an ongoing attempt to define variables associated with vacuum assisted delivery (VAD).

Method: A single electronic gauge with vacuum sensor, microprocessor and digital display was connected to 37 [reusable and single use] handheld vacuum pumps and a certified reference gauge calibrated to 0.25%. Vacuum was created by the handheld pump in 10 cmHg increments as indicated by the reference gauge. The corresponding values from the electronic vacuum gauge were recorded over a range of 0 to 60 cmHg, and the process was repeated 4 times with each pump for a total of 148 cycle repetitions. The measurements were averaged and standard deviations (SD) were calculated.

Results: The deviation of the electronic gauge readings from the reference gauge did not exceed 1 cmHg. The SD for each measured value (0 to 60 cmHg) ranged from 0.0 to 0.18 cmHg, with an average SD of 0.09 cmHg across the measured values.

Conclusion: The electronic vacuum gauge used in this study proved to be highly accurate and repeatable. The design of the gauge incorporates an electronically programmed look-up table that accurately and reliably displays a numeric value for any vacuum created in the system. Clinical application of the device will allow graphic display of the measured vacuum values on a maternal-fetal monitor creating permanent documentation of the vacuum utilized for VAD.

Vacuum Birth Safeguard (VBS) Compared to Standard

