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A Clinical Study to Compare the Accuracy of a Wireless Temperature Monitoring Device, ThermoSensor, with Infrared, Digital and Mercury Thermometers at Various Measurement Routes

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Aim: The aim of this study was to investigate the clinical accuracy of a wireless thermometer, ThermoSensor, by comparing it with infrared, digital and mercury thermometers at various measurement routes.

Methods: The study was conducted for 13 days in November 2005 on 364 subjects, aged 21 years to 90 years, from air-conditioned and non-air-conditioned wards, including high-dependency units and intensive-care units. Patients with pacemaker implants, in isolation rooms, and psychiatric patients were excluded. ThermoSensors were affixed onto 3 sites of each patient: right abdomen; right underarm; and below right collarbone. Measurements were taken 3 times a day and a total of 1092 data points were used for analysis. The accuracy of the ThermoSensor was determined by the percentage of readings measuring within 0.5 degree and 1 degree to mercury-underarm, digital-underarm, and Braun-ear. Statistical analysis was performed using SPSS 13.0.

Results: Within 0.5 degree, ThermoSensor was accurate compared to the other instruments in the range of 48.9% to 69.6% and from 81.0% to 92.6% for the "within 1 degree tolerance" across the sites. There was greater accuracy between ThermoSensor with digital-underarm and Braun-ear as compared to mercury-underarm.

Conclusion: In the era of epidemics, temperature monitoring is crucial in determining the rate of infection and evaluating treatment plan. This revolutionary new wireless temperature monitoring device, which is able to detect skin temperature continuously, will minimise contact with patients, and enable the analysis of trends in body temperature to aid the treatment regime of patients. Given its comparable accuracy to digital and infrared thermometers, it is worthwhile to consider exploring its usage.