Detection of Hyperoxaemia in Neonates: Data from Three New Pulse Oximeters.
Bohnhorst B., Peter C.S., Poets C.F. *Arch Dis Child Fetal Neonatal Ed.* 2002 Nov;87(3):F217-9.

Aim
To determine the sensitivity and specificity of three newly developed pulse oximeters in the detection of hyperoxaemia, defined as an arterial partial pressure of oxygen (PaO2) of > 80 mm Hg.

Methods
SpO2 readings from three oximeters (Agilent Viridia (AgV), Masimo SET (MaS), Nellcor Oxismart (NeO) were documented in 56 infants (median gestational age at birth 35.5 weeks, range 24-41) whenever an arterial blood gas was taken for clinical purposes. Blood samples were analysed within one minute in a Radiometer ABL 505 blood gas analyzer and OSM3 co-oximeter.

Results
Between 280 and 291 blood gases were analyzed for each instrument; 105-112 showed a PaO2> 80 mm Hg. At an upper alarm limit of 95%, the three instruments detected hyperoxaemia with 93-95% sensitivity. Specificity at this alarm level ranged from 26 to 45%. The mean (SD) difference between arterial oxygen saturation and SpO2 (bias) was -0.25 (2.5)% for AgV, -0.06 (2.5)% for MaS, and -0.91 (2.6)% for NeO ($p < 0.01$, NeO v AgV and MaS).

Conclusions
These instruments detected hyperoxaemia with sufficient sensitivity at an upper alarm limit of 95%, but showed differences in their specificity, which was probably related to differences in measurement bias.