Detection of Hyperoxaemia in Neonates: Data from Three New Pulse Oximeters.

**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.