First Day of Life Pulse Oximetry Screening to Detect Congenital Heart Defects.

Objective
To evaluate the efficacy of first day of life pulse oximetry screening to detect congenital heart defects (CHDs).

Methods
We performed a population-based prospective multicenter study of postductal (foot) arterial oxygen saturation (SpO₂) in apparently healthy newborns after transfer from the delivery suite to the nursery. SpO₂< 95% led to further diagnostic evaluations. Of 57,959 live births, 50,008 (86%) were screened. In the screened population, 35 CHDs were classified as critical (ductus dependent, cyanotic). CHDs were prospectively registered and diagnosed in 658/57,959 (1.1%) newborns after transfer from the delivery suite to the nursery.

Results
Of the infants screened, 324 (0.6%) failed the test. Of these, 43 (13%) had CHDs (27 critical), and 134 (41%) had pulmonary diseases or other disorders. The remaining 147 infants (45%) were healthy with transitional circulation. The median age for babies with CHDs at failing the test was 6 hours (range, 1-21 hours). For identifying critical CHDs, the pulse oximetry screening had a sensitivity rate of 77.1% (95% CI, 59.4-89.0), specificity rate of 99.4% (95% CI, 99.3-99.5), and a false-positive rate of 0.6% (95% CI, 0.5-0.7).

Conclusions
Early pulse oximetry screening promotes early detection of critical CHDs and other potentially severe diseases. The sensitivity rate for detecting critical CHDs is high, and the false-positive rate is low.