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

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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 (SpO$_2$) in apparently healthy newborns after transfer from the delivery suite to the nursery. SpO$_2$< 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%)

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.