

Premature infant survival and health outcomes improve over 20 years, study shows

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A study of extremely preterm infants born at U.S academic medical centers over the last 20 years found changes in maternal and infant care practices, resulting in modest increases in survival and reductions in several neonatal complications.

The study will be published in the September 8 issue of *JAMA*.

Overall survival increased most significantly in infants born at 23-24 weeks, but survival without major health problems identified prior to hospital discharge increased most in infants 25-28 weeks. The study found an increase in one complication of prematurity, however—bronchopulmonary dysplasia.

The review of 20-year trends in maternal/neonatal care, complications and mortality among extremely preterm infants was conducted by the Neonatal Research Network (NRN), a consortium of US [academic medical centers](#) sponsored by the Eunice Kennedy Shriver National Institute of Child Health and Human Development at the National Institutes of Health.

Lead author was Barbara J. Stoll, MD, George W. Brumley, Jr., Professor and Chair of Pediatrics, Emory University School of Medicine and director, Emory and Children's Healthcare of Atlanta Pediatric Center.

The study evaluated 34,636 infants born at 22-28 weeks gestational age and 401 to 1500 grams birth weight at 26 NRN centers between 1993 and 2012.

"This study is the first comprehensive NRN review to evaluate 20 years of changes in care practices, major health problems and survival of extremely premature infants," says Stoll. "Our findings show that progress is being made and outcomes are improving. This information should be valuable in counseling families and in developing new interventions to help prevent and treat significant health problems in these infants."

Severe health problems in infants who survived more than 12 hours included infection, severe necrotizing enterocolitis, bronchopulmonary dysplasia, severe intracranial hemorrhage, cystic periventricular

leukomalacia, and severe retinopathy of prematurity.

Changes in care of preterm infants over the 20 years included an increase in antenatal corticosteroid use, an increase in cesarean delivery and a decrease in delivery room intubation. Between 2002 and 2012 there was an increase in continuous positive airway pressure without ventilation. The 1990s saw an increase in postnatal steroid use, followed by a decrease until 2004.

Although rates of most serious health problems declined, bronchopulmonary dysplasia increased between 2009 and 2012 for infants born at 26-27 weeks but did not change significantly for infants born at 22-25 or 28 weeks. The authors noted a decrease in late-onset sepsis between 2005 and 2012.

Overall survival to discharge increased between 2009 and 2012 for infants born at 23 weeks (27 percent to 33 percent) and for infants born at 24 weeks (63 percent to 65 percent), with smaller relative increases in survival for infants born at 25 and 27 weeks, and no change for infants born at 22, 26 and 28 weeks.

Survival to discharge without major health problems increased approximately two percent per year for infants born at 25-28 weeks, with no change for infants born at 22-24 weeks.

Over 20 years of the study population, the researchers found that maternal hypertension increased from 12 to 27 percent, and maternal insulin-dependent diabetes increased from 2 to 5 percent. A major birth defect was reported for 1,292 infants (3.7 percent), with no significant change in percentage over 20 years. The percent of infants from a multiple birth increased from 18 percent in 1993 to 27 percent in 1998, with no further increase during the study period. Infants in the study were 52 percent male.

The infants were delivered in academic centers with the availability of comprehensive obstetrical management and neonatal care, the authors note, and there was an increased adherence to care practices associated with improved neonatal outcomes.

"Our analysis shows that survival of extremely premature infants and survival without major health problems have improved over 20 years," says Stoll. "One of our most important new findings is a significant increase in survival without major neonatal [health problems](#) for infants born at 25-28 weeks. We will continue to seek even better strategies for long-term health, particularly reducing brain injury and promoting healthy neurodevelopment. At the same time, we must focus on reducing the high rates of preterm birth, with approximately 450,000 [infants](#) born prematurely in the United States each year."

More information: *JAMA*, doi:10.1001/jama.2015.10244

Provided by Emory University

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