Background and aims Cerebral MRI is increasingly used to depict the wide spectrum of preterm brain injury. Furthermore, MRI also illustrates postnatal brain development in preterm infants. It has been shown by MRI at term-equivalent age (TEA) that preterm infants show a delayed brain maturation as compared to term infants and this delay has been related to neurobehavioral outcome. The aim of the present study was to investigate the influence of prevalent neonatal morbidities on structural cerebral brain maturation in a cohort of preterm infants born at a GA ≤32 completed weeks.

Methods 130 very preterm infants born at a mean gestational age of 29.7 ± 2.1 weeks and a mean birthweight of 1265 ± 405 grams were included. Brain MRI was performed at a mean postmenstrual age of 40.7 weeks (range 39–43). Structural brain development was evaluated by a validated “total maturation score”. Brain maturation was correlated to neonatal data.

Results In univariate analysis bronchopulmonary dysplasia (BPD) and late-onset sepsis were significantly associated with delayed brain maturation. In multivariate analysis BPD remained significant for delayed maturation, with the diagnosis BPD carrying a fourfold risk for delay.

Conclusions This study is the first to show that delayed structural brain maturation in preterm infants at TEA is preceded by BPD, which is a known predictor of adverse outcome. This finding adds further evidence that the neural correlates of adverse outcome go beyond mere brain “injury”.

Background and aims In Switzerland, survival of extremely preterm infants (gestational age (GA) <26 weeks) improved following the publication of the 2002 Swiss Guidelines for the care of infants born at the limit of viability, and remained stable thereafter. We compared the 2-year-outcome of survivors of cohorts born before and after the publication of the Guidelines.

Methods 2-year-outcome of surviving preterm infants (GA 22–25 weeks) born in 2000–2001 (pre-Guideline), 2003–2004 (post-Guideline), and 2005–2009 (long-term) were compared. Neurodevelopment was assessed using the BSID-II or the Griffiths Mental Development Scales. Moderate neurodevelopmental impairment (NDI) was defined as development index of −3/−2SD from the norm, or mild cerebral palsy (GMFCS level 2); severe NDI as developmental index of <−3SD from the norm, cerebral palsy (GMFCS level ≥3), deafness or blindness.

Results Of 342 survivors, follow-up data was available for 294 (86%), 29 (8%) infants were lost to follow-up, and 19 (6%) datasets were not comparable. Normal development was observed in 48%, 47% and 54%, moderate NDI in 25, 30 and 26%, and severe NDI in 19%, 10% and 15% of the cases in the pre-Guideline cohort, the post-Guideline cohort and the long-term cohort, respectively. None of these differences over time were significant ($\chi^2$, p > 0.1).

Conclusion 2-year-outcome in survivors after extremely preterm birth remained stable despite improved survival rates following the publication of the Guidelines for the care of infants born at the limit of viability.