mental temporal gyrus, right cuneus, left inferior parietal lobule and left parieto-occipital arcus) at 6 years. The effect of preterm birth in the right junction of paracentral lobule and the precuneus and in the right transverse temporal gyrus shows statistically significant differences between groups ($p=0.001$, positively correlated with thickness at 6 years in the IUGR group and negatively correlated in the non-IUGR group).

**Discussion/conclusion** Our results indicate that the regional structural reorganization of cerebral cortex after preterm birth differs in IUGR and non-IUGR subjects. Preterm birth affects the higher order association areas with increased thickness or less thinning in IUGR than non-IUGR born children. These cortical changes might underlay the specific functional deficits observed in these children.

**Methods** 68 consecutive term and preterm neonates, who received 3 Tesla MRI of the brain with SWI (Magnetom Skyra, Siemens Healthcare) during neonatal care, were included in this study between 05/2011 and 02/2012. MR was performed using a MR-compatible incubator with compatible head coil (LMT nomag, Luebeck, Germany) under sedation. MRI was analyzed by two radiologists independently. Inter-rater agreement was estimated by Cohen’s kappa coefficient.

**Results** MRI and cUS were feasible in all 68 neonates (38 girls, 30 boys, mean gestational age at birth 31.9 weeks). Both radiologists independently identified (post-)hemorrhagic alterations in 20 of 68 infants by SWI (inter-rater agreement: $k=1$). In 10 of this was in agreement with cUS, but in 4 of them additional intraventricular and/or parenchymal hemorrhagic components were diagnosed by MRI. All patients with suspected intracranial hemorrhage by cUS were confirmed by SWI.

**Conclusions** We found improved detection of intracranial hemorrhage with high inter-rater agreement by MRI using SWI compared to cUS in the detection of intracranial hemorrhage.

**Background and aims** Magnetic resonance imaging (MRI) at term age has been reported to be superior to cranial ultrasound (cUS) in detecting white matter abnormalities. The aim of this retrospective study was to compare sensitivity of MRI using SWI (susceptibility weighted imaging) and cUS in the detection of intracranial hemorrhage.

We studied 52 preterm infants, with a median GA at birth of 27+1 (24–32 weeks). DTI data were analysed using tract based spatial statistics (TBSS). Voxel based statistics was performed to assess the correlation between GA at birth and FA, corrected for PMA at scan.

**Results** Scan 1: 31 (25–33) weeks PMA.

There were no significant correlations between GA at birth and FA in any WM region.

Scan 2: 41–44 weeks PMA.

GA at birth was significantly linearly correlated with FA values in the corpus callosum, internal and external capsule, optic radiation, cerebral peduncles, cingulum and inferior longitudinal fasciculus.

**Conclusions** These data suggest that diffuse WM injury is not an inevitable consequence of preterm birth, and imply there may be a window of opportunity between birth and term equivalent age where intervention with appropriate treatments may ameliorate the adverse effects of prematurity on WM development.

**Background and aims** Magnetic resonance imaging (MRI) at term age has been reported to be superior to cranial ultrasound (cUS) in detecting white matter abnormalities. The aim of this retrospective study was to compare sensitivity of MRI using SWI (susceptibility weighted imaging) and cUS in the detection of intracranial hemorrhage.

**Methods** 68 consecutive term and preterm neonates, who received 3 Tesla MRI of the brain with SWI (Magnetom Skyra, Siemens Healthcare, Erlangen, Germany) around term and serial cUS (Acuson sequoia 512, Siemens Healthcare) during neonatal care, were included in this study between 05/2011 and 02/2012. MR was performed using a MR-compatible incubator with compatible head coil (LMT nomag, Luebeck, Germany) under sedation. MRI was analyzed by two radiologists independently. Inter-rater agreement was estimated by Cohen’s kappa coefficient.

**Results** MRI and cUS were feasible in all 68 neonates (38 girls, 30 boys, mean gestational age at birth 31.9 ± 2.5 weeks). MR imaging was done at 40.3 ± 3.0 (range 30.7–55.7) weeks. Both radiologists independently identified (post-)hemorrhagic alterations in 20 of 68 infants by SWI (inter-rater agreement: $k=1$). In 10 this was in agreement with cUS, but in 4 of them additional intraventricular and/or parenchymal hemorrhagic components were diagnosed by MRI. All patients with suspected intracranial hemorrhage by cUS were confirmed by SWI.

**Conclusions** We found improved detection of intracranial hemorrhage with high inter-rater agreement by MRI using SWI compared to cUS in the detection of preterm and preterm infants. All hemorphages diagnosed by cUS could be confirmed by MRI.