Twins conceived following ART were admitted to NICU 17% less frequently than the naturally conceived population in unadjusted admission rates. Adjustments for gestational age exacerbated this difference.

**PF:20** INTRAUTERINE TRANSFUSION FOR RHEUMATOID ARTHRITIS ISOMUNISATION IN SCOTLAND

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Scottish intrauterine transfusion (IUT) cases for severe Rhesus iso- immunisation over 2002–2011 were reviewed. One hundred and forty-one pregnancies underwent 437 IUTs (mean 3.9, range 1–8).

One hundred and thirty-one fetuses had middle cerebral artery Doppler peak systolic velocity values documented. All were >1.5 multiples of median prior to the first IUT, except for one that was inactive with a pericardial effusion. Twelve fetuses were hydropic. The haematomit value prior to initial IUT was 20–29% in 38% of cases, whilst 27% had a haematocrit between 10–19%. Initial IUT was most commonly performed between 29–32 weeks gestation (35%) followed by 25–28 (26%) and 21–24 (21%) weeks gestation (range 17–25 weeks).

In the majority of cases, fetus was transfused via umbilical vein (80%). Fourteen percent of transfusions were performed intrahepatically, 3% intraperitoneally and 3% were undocumented. Complications occurred in 58 (13%) IUTs and include cord haematoma, difficult procedure, bradycardia or tachycardia necessitating un-planned delivery, and in utero death (5 fetuses). The procedure-related loss rate was 1%.

Birth outcomes were documented in 108 cases with a 94% live birth rate (n = 102). One patient underwent termination of pregnancy for trisomy 21. Short term postnatal outcomes were available for 86 neonates: 33 neonates required phototherapy only, with 31 cases requiring top-up transfusions. Nine neonates had an exchange transfusion and 9 had immunoglobulin or erythropoie-
tin. Four neonates did not require any treatment. We conclude that our live birth and procedure-related loss rates are consistent with other published series. Parents need to be aware of potential postnatal therapies.

**PF:21** BRAIN ABNORMALITIES AND NEURODEVELOPMENTAL DELAY IN CONGENITAL HEART DISEASE: SYSTEMATIC REVIEW AND META-ANALYSIS

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Objectives Studies have demonstrated an association between congenital heart disease (CHD) and neurodevelopmental delay, partly attributed to the risk of brain injury during cardiac surgery. However, neuroimaging studies have demonstrated a high incidence of preoperative brain abnormalities. The aim of this study was to perform a systematic review in order to quantify the non-surgical risk of brain abnormalities and neurodevelopmental delay in fetuses/newborns with CHD.

Methods MEDLINE, EMBASE and The Cochrane Library, without language restrictions were searched electronically, utilising combinations of the terms congenital heart, cardiac, neurologic, neurodevel-

dopment, MRI, ultrasound, neuroimaging, autopsy, preoperative and outcome. Reference lists of relevant articles and reviews were hand searched for additional reports. Cohort and case-control studies were included. Case reports and editorials were excluded. Between-study heterogeneity was assessed using the I² statistic.

**Results** The search yielded 9,129 citations. Full manuscripts were retrieved for 119, and 30 were included in the review and meta-analysis. 21 studies (n = 953) have reported brain abnormalities in fetuses, newborn or infants with CHD, either preoperatively or in those who did not undergo congenital cardiac surgery. The remaining 9 studies (n = 512) have reported preoperative data on neurodevel-

dopmental assessment in newborn or infants with CHD. The prevalence of brain abnormalities was 36% (95% CI, 26%, 47%; I² = 90.5%) and of the neurodevelopmental delay 42% (95% CI, 34%, 51%; I² = 68.9%), though with heterogeneity between studies.

**Conclusions** In the absence of chromosomal or genetic abnormalities, fetuses with CHD are at increased risk of brain abnormalities and neurodevelopmental delay, which are independent of the surgical risk.

**PF:22** ESTABLISHING NORMOGRAMS FOR CERVICAL LENGTH IN PREGNANCY

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Objective To construct normograms for cervical length in low-risk, singleton pregnancies from 14 weeks to 40 weeks gestation.

**Study design** This was a prospective, cross-sectional study involving low-risk women attending Cork University Maternity Hospital conducted concurrently with a primary study to construct normo-

grams for fetal biometry. Women were recruited in the first trimester and randomly allocated to a single scan between 14–40 weeks gestation. Scans were performed by a sole researcher. Gestation was calculated using the estimated due date assigned by dating scan. Recruits were Irish Caucasian women with a singleton pregnancy. Women with a previous history of preterm labour, mid-trimester pregnancy loss, cervical suture, cone biopsy and large loop excision of transformation zone (LLETZ) were excluded. Measurements were obtained transvaginally using the Voluson E8 ultrasound by GE Healthcare.

**Results** Seven-hundred-and-ninety-three women were recruited into the primary study. Five-hundred-and-fifty-five women consented to cervical length measurements and were scanned as per protocol. Median maternal age was 32 (range 17–44). Median BMI was 24.7 (range 17.1–48.6). Nulliparous women constituted 46.5% (369/793) of recruits, 32.6% (261/793) were expecting their second child, 18.3% (145/793) were expecting their third or fourth child, whilst only 2.3% (18/793) were grand multiparous. Normograms for cervical length have been generated for this population. The following table demonstrates the calculated percentiles for each gesta-

**Conclusion** We have constructed normograms for cervical length from 14 to 40 weeks gestation in the low-risk Irish Caucasian population.

**PF:23** MEDIUM TERM CHILDHOOD OUTCOME OF ISOLATED CONGENITAL TALIPES EQUINOVARUS DIAGNOSED ANTENATALLY

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Congenital talipes equinovarus (CTEV) is one of the most common developmental abnormalities affecting the lower limb. It may be associated with a variety of disorders and can be diagnosed antena-
tally using high-resolution ultrasound. Depending on severity, treatment usually involves passive manipulation of the affected joint or surgery. We investigated the medium-term childhood out-

come of children diagnosed antenatally with isolated CTEV. Over a