Background Patent ductus arteriosus (PDA) is a major cause of morbidity and mortality in preterm neonates. Surgical ligation (SL) and device occlusion (DO) are important treatment options for PDA closure, if medical management is unsuccessful or contra-indicated. Surgical options usually involve the transfer of the neonate to a cardiac centre (CC).

Objectives This study aimed to review the clinical practice and outcomes of preterm neonates born across the East of England (EoE) who underwent surgical closure of PDA between Cohort A (2015 – 2019) and compare these findings with a previous study which looked at cohort B between 2004 and 2009 (Kang et al, ADC 2013).

Methods This retrospective study was conducted across neonatal units in the EOE network to review the outcomes of premature infants who underwent surgical closure of PDA. All infants born at less than 37 weeks gestation who were referred to the Acute Neonatal Transport service (ANTS) for transfer to CC between January 2015 and December 2019 for PDA surgical closure were included. They were identified from the ANTs database. Babies who did not undergo surgical closure after referral to ANTs were excluded from the study final analysis.

Results Of the 85 babies identified 75 infants underwent PDA closure in Cohort A (60 months) compared to 92 in Cohort B (52months) a reduction of 18.5%. On cohort A, babies were born at a gestation of median 25+5(22–33) weeks with birthweight 730 (490 – 3835) grams. 56 (74.7%) underwent SL and 19 (25.3%) underwent DO. Surgical complications occurred in 10 infants (13.3%), which included pneumothorax (2), lung collapse (2), limb thromboembolism post catheterisation (3) and infection (3). Limb ischaemia occurred in 3 of 19 (15.8%) of babies undergoing DO. In terms of morbidity: 65 (86.7%) had chronic lung disease (CLD), with 46(70.8%) discharged on home oxygen. 23 (30.7%) had intraventricular haemorrhage (IVH) with 1 baby needing shunt insertion. 18(24%) had necrotizing enterocolitis (NEC), with 3 of these (16.7%) undergoing a laparotomy. The incidence of morbidities was lower than reported in the previous cohort B, which were CLD 88%, IVH 49% and NEC 39% respectively. 44 of 73 (60.3%) babies in cohort A who qualified for screening had retinopathy of prematurity (ROP) of whom 21(47.7%) required intervention. This was higher than the incidence of 42% reported in previous study. There were no deaths in Cohort A after the procedure prior to hospital discharge compared 4 (4.3%) in the previous study.

Conclusions This study shows that fewer premature infants are undergoing ‘surgical’ PDA closure. More catheter based procedures are being performed. There was a reduction in mortality rates. Morbidity rates remain high but have improved. ‘Surgical’ closure of the PDA is a safe procedure for the small numbers of babies who fail to respond to medical treatment.